Nexa Center for Internet & Society
Politecnico di Torino

Annual Report 2020

Studying the Internet, exploring its potential & experimenting new ideas

Nexa Center for Internet & Society

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The Nexa Center for Internet & Society is a research center of the Department of Control and Computer Engineering at Politecnico di Torino (www.dauin.polito.it).

This report was curated by Mattia Plazio with the contributions from the Nexa Staff, Directors and Community.

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FOREWORD

In the final part of last year, the life of the Nexa Center was affected by the Covid-19 pandemic crisis. Luckily, none of the staff members and of the members of the fellows' community was ill, but some additional uncertainties on how to find funding in the future had to be faced. At the moment, the problem does not seem to be connected to the money coming from the Politecnico, that are used to maintain part of the staff. But for what concerns the project proposals to the EU and to other subjects, they dramatically diminished if compared to the previous years, as it was strategically decided not to risk that they are ultimately not financed, due to a possible decision of using them for other purposes. Nevertheless, some prestigious research activities were carried on, such as for TIM, the main Italian Telecommunication company, on the ethical and legal aspects of the use of AI in TLS, and for Agid, the Agency for Digital Italy of the Presidency of the Council of Ministers, on assessing and comparing open source software, both technically and economically, in view of assisting Public Administrations in acquiring it. Such collaborations (not all of them but works of this kind) will go on in the coming year and the Nexa Center is confident it will find a way to overcome the economic crisis to come.

Such an optimism is also due to the fact that in the last months the importance of the Nexa Center activities was appreciated at a national level, because of the work of prof. Marco Ricolfi as Chairman of the Permanent Advisory Committee to the Italian Culture Ministry and his appointment for tasks such as the adoption in Italy of the European copyright. But also because of the decision of writing an open letter to the Italian Ministry of Innovation, aimed at defining the principles upon which the Nexa community would accept to use digital technologies to monitor citizens contacts with persons potentially affected by the SARS-CoV-2 virus and the development of the coronavirus contagion. In fact, in Italy, as in many other countries in the world, the government decided to recur to an app and therefore, ultimately to digital surveillance technologies to fight the pandemic and the Center was concerned on how the tool may be used or misused. Its open letter was subscribed by hundreds of influential scholars and people involved in the debate on digital technologies and society and it took the Nexa Center under the mass media lime lights.

Hopefully, such activities will be useful also to give more visibility to the Nexa Center research and teaching on Artificial Intelligence and Society, Technology and Society, Internet Power and Rights and Education. In particular, for what concerns AI and society, in the last year much was done on fairness in machine learning, specifically in the ranking systems domain, on the political visions of society that stand behind the fairness criteria of the algorithms we resort to, on the impact of poor data quality and biases in the data on the automatic decisions made by software applications, and on AI in the TLC domain, from an ethical point of view, but also examining the emerging guidelines at European and national level and reflecting on the ethical codes adopted by companies.

For what concerns technology and society, the research for Agid on the adoption of open source software by the State administrations was already mentioned, while for what concerns Internet power and rights, the DECODE project on increasing digital sovereignty of European citizens came to an end, with an important dissemination final event held in Turin, which was very successful and once again took some of the Nexa Center research topics under the mass media lime lights. Moreover, a very promising research line was started on the laws of connected drones controlled by the network, which is a very hot topic in the city of Turin, where the authorities are experimenting the use of drones in many fields. Finally, the research on payment channel networks for blockchain scalability was continued and in this context CLoTH was developed, a simulator for payment channel networks, with the aim of identifying issues, analyzing solutions and steering future developments in this field.

For what concerns education, the Nexa Center continued to coordinate the Erasmus+ project Edu-Hack, that intends to support teachers' professional development through open online courses, and it went on in the development of the Geranium platform, to reduce the barriers for accessing scientific publications by citizens and to create new collaboration opportunities between researchers of the Politecnico of Turin. Moreover, for what concerns the teaching activities, further than the usual courses (*Digital revolution*, *Digital technologies and society*, *New media languages*), a new one was launched - *Data Ethics and Protection* - a Master Course of Science in Data Science and Engineering at the Politecnico and another course will start next year – *Semiotics of digital cultures* – in the Master Degree on Communication and Media Cultures at the University of Turin. Always at the University of Turin, the Nexa Center gave courses on digital revolution in the Master of Journalism. This was also the topic of *Being digital*, a course given in the project *Riconnessioni* of Fondazione per la scuola (Compagnia di San Paolo), to the teachers of primary and secondary schools of Turin.

In the teaching activities, but also in the researches mentioned above, it is clear the strong relationship between the Nexa Center and the territory of Turin, which was strengthened with the *Festival della Tecnologia* (Festival of technology), organized to celebrate the 160th year from the foundation of the Politecnico. The event took hundreds of experts on technology and society to talk to thousands citizens and it was such a huge success that the major of the city, together with the rector of the Politecnico and other authorities decided to make it a permanent event, giving birth to *Biennale Tecnologia*, that will take place every two years and that will start this year, in November 2020, under the direction of prof. Juan Carlos De Martin and Luca De Biase.

Biennale Tecnologia is maybe the most visible fruit (in terms of popularity) of the Nexa Center attitude towards interdisciplinarity, as this event would not be possible without putting together knowledge coming from all the research fields on technology and society. *Technology and society* is certainly the hot topic for what concerns the future of the Nexa Center as its attention is shifting on it, hence broadening its sight, which will no more be restricted only on Internet and society. This is the reason why the Nexa Center has decided to collaborate with *Scienza Nuova*, a new research center co-founded by the Politecnico of Turin and by the University of Turin. Together with *FULL*, the Future Urban Legacy Lab of the Politecnico of Turin, in which it works with architects, economists and other engineers, *Scienza Nuova* is another example of how the Nexa Center is trying to open itself to the rest of the scientific community.

It is clear that the coming year will be a very interesting one. In the pandemic crisis, digital technologies have proved - if there was still need of it - that they are at the core of our society. This made more visible their strengths, but also their weaknesses and all the problems they may take to our lives. In general, people looked on technology and on science to overcome the threat took by nature on their survival, as it has always happened. But, once again, this contributed to show strengths and weaknesses of technology and science. A lot of work will have to be done to re-take our lives to normality and a huge effort will have to be taken to think about what "normality" means. The pandemic crisis opened a time in which many old paradigms may change and the Nexa Center looks forward to contributing to the reflection needed to go in the right direction.

Juan Carlos De Martin and Marco Ricolfi – Faculty Directors

Nexa Galaxy 2020

Legend
▶ Public Institutions
Media
Companies
Non Profits
Academic
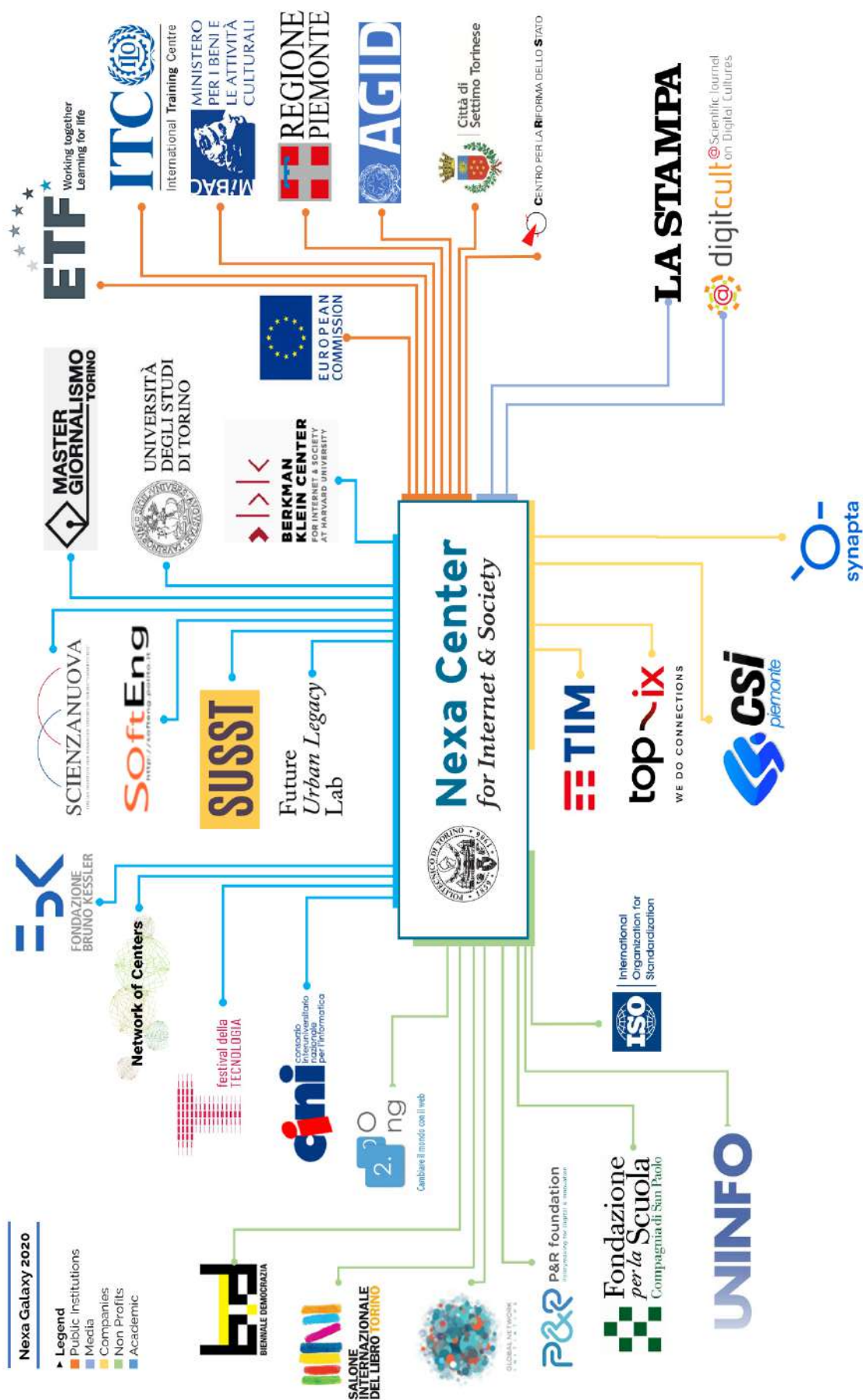
DIRECTORS

Juan Carlos De Martin
Founder and Co-Director

Juan Carlos De Martin is full professor of the Politecnico di Torino (Italy) where he teaches computer science and digital culture and where, since March 2018, he serves as Rector's Delegate for Culture and Communication. Since 2011 he has also been associated with the Berkman Klein Center for Internet & Society at Harvard University, first as Faculty Fellow and now as Faculty Associate. Between 2007 and 2011 Juan Carlos De Martin was the coordinator of COMMUNIA, the European thematic network on the digital public domain, with 50 members from Europe and overseas. In 2012 he edited, together with Melanie Dulong de Rosnay, the book *The Digital Public Domain: Foundations for an Open Culture* (OpenBookPublishers, UK), while in 2017 he published a book on the future of university in the Internet age, *Università Futura - Tra Democrazia e Bit* (Codice Edizioni, 2017). Between 2014 and 2018 De Martin served as an expert member of the Study Commission on Internet Rights established by the President of Italy's Chamber of Deputies. Juan Carlos De Martin also serves as member of the Scientific Board of the Institute of the Italian Encyclopedia Treccani. He is an op-ed contributor to the national newspaper "La Stampa" and he often acts as a commentator in Italian media.

Marco Ricolfi
Founder and Co-Director

Marco Ricolfi received his degree at the Faculty of Law of the University of Turin in 1974. Master of Laws, Yale Law School, 1975-1976. He is currently full professor of Intellectual Property Law at Turin Law School, where he also teaches Business Law. In 2007, Prof. Ricolfi has advised EU institutions since 1990 and was, inter alia, a member of the "High-Level Expert Group on the European Digital Libraries" created by the European Commission. He is currently a member of the European Copyright Society and, since May 2019, Chairman of the Permanent Advisory Board to the Italian Government on Copyright. Among his works: *Il futuro della proprietà intellettuale nella società algoritmica*, in Giur. it., Supplemento 2019, 10-36; *The Internet of Things and the Ages of Antitrust*, in Concorrenza e mercato 2017; *The new paradigm of creativity and innovation and its corollaries for the law of obligations*, in (eds) Peter Drahos-Gustavo Ghidini and Hanss Ullrich; *Kritika: Essays on Intellectual Property, Vol I*, Edward Elgar, Cheltenham, 2015, 134-205; *Trattato dei marchi. Diritto europeo e nazionale*, Voll. 1 e 2, Giappichelli, Torino, 2015.

EXECUTIVE SUMMARY

The previous page shows the "Nexa 2019-2020 Galaxy", i.e. the main external entities with whom Nexa Center interacted. At the end of the executive summary, the reader will in turn find the "Nexa 2019-2020 Timeline", which reports the most relevant events of the last 12 months for our Center's life, as well as "Nexa in the world", which displays the travels of our staff to participate to conferences, project meetings, etc.

The activities of the Nexa Center over the period July 2019-May 2020 can be summarized in four working areas: Artificial Intelligence and Society, Technology and Society, Internet Power and Rights and Education.

ARTIFICIAL INTELLIGENCE AND SOCIETY

"Artificial Intelligence and Society" concerns the research and development work done in the field of AI, keeping in mind how this technology can have an impact on our everyday lives. The research focused on data and algorithms ethics, politics, law and semantic modelling through deep learning, with specific applications in urban contexts and TLC.

For what concerns data and algorithms ethics, a contribution was given to the debate on fairness in machine learning, in particular in the ranking systems domain, discussing the impact that recent proposed fairness formalizations may have on societies, proposing new solutions to re-calibrate ranking outcomes subject to fairness constraints and studying the trade-off among fairness and traditional ranking systems utility (see p. 11). This technical research was strictly connected with a more philosophical one, on the political visions of society that stand behind the fairness criteria of the algorithms we recur to every day (see p. 12). The results of these two researches were very intertwined. Always in the field of data and algorithm ethics, a new phd study was started, to investigate the impact of poor data quality and biases in the data on the automatic decisions made by software applications (see p. 15).

Together with the legal competences of the Nexa Center, some of the knowledge produced in the three researches mentioned above was applied to a specific case study, as requested by TIM, the main Italian Telecommunication company: AI in TLC, focusing on the issues of discrimination that may arise there, analysing the complex concept of equity aimed at mitigating such discrimination, examining the emerging guidelines at European and national level and reflecting on the ethical codes adopted by companies (see p. 16). Another application field of the Nexa Center studies was in FULL (Future Urban Legacy lab), a research centre of the Politecnico of Turin, where the project of a Digital Open Urban Twin (DOUT) of the town of Turin, already begun last year, went on, with the aim of collecting and analysing big data coming from the territory. Some steps forward were made to help researchers and policy makers spatially correlate and visualize, beyond the more consolidated uses of 3D city models and 3DGIS, how urban phenomena/problems are distributed across different areas of the city and how they are connected at multiple scales (see p. 14).

Last but not least, a research on semantic modeling through deep learning was carried on, trying to reconstruct the semantics of semi-structured sources of data, to automatically build and complete knowledge graphs. This led to produce some reflections on an emergent and very interesting research field: the explainable AI (see p. 13).

TECHNOLOGY AND SOCIETY

As in the last years, the relationship between "Technology and society" was a very important topic in 2019-2020. The Festival della Tecnologia, the international event which the Nexa Center contributed to organize took place in Turin in November 2019 and it was such a huge success that the major of the city, together with the Rector of the Politecnico of Turin and other authorities decided to make it a permanent event, giving birth to Biennale Tecnologia and alternating it with another very important Festival in town: Biennale Democrazia. This year the event will take place again, focusing on technology and sustainability (see p. 18).

Biennale Tecnologia is the result of the Nexa Center determination to work on interdisciplinarity, as last year its claim was "Technology is humanity". This motto can be used to describe also SUSST (Scienze Umane e Sociali per le Scienze e la Tecnologia, see p. 19), the study that prof. De Martin, with other colleagues, continued to carry on, to include the humanities in the context of the scientific research and didactics carried out at Politecnico. Some steps forward were made, as next year some new humanistic courses will be given.

Moreover, on "Technology and society" the Nexa Center conducted a very prestigious research for Agid (Agenzia per l'Italia Digitale). The project consisted in defining a procedure for assessing and comparing open source software, both technically and economically. Such procedure aimed to assist Public Administrations in acquiring open source software. The procedure was defined also with the help of the Piedmont Region (see p. 21).

INTERNET POWER AND RIGHTS

As to the topic "Internet Power and Rights", first of all a mention must go to the battle that the Nexa Center fought and is still fighing to vigilate on the choices of the Italian government on Immuni, the app that citizens should be supposed to install on their mobile phones, to be warned when they meet people affected by che corona virus. All over the country – and not only in Italy – there was a lot of concern about all the problems that such decisions would take, in terms of guaranteeing legal and constitutional rights. So the Center wrote an open letter that was subscribed by many intellectuals, scholars and citizens (https://nexa.polito.it/lettera-aperta-app-COVID19), and that contributed to the national debate, taking the Center itself under the media limelights. In parallel, the work of prof. Marco Ricolfi as Chairman of the Permanent Advisory Committee to the Culture Ministry went on and many Nexa Center fellows were involved in the reflection on how to adopt in Italy the principles of the Copyright Directive voted at the European parliament some months ago.

For what concerns the researches on "Internet Power and Rights", the DECODE project, that aimed at increasing digital sovereignty of European citizens by enabling them to produce, access and control their data and exchange contextualized information in real-time, in a confidential and scalable manner, came to an end, with its final event which took place in Turin and that the Nexa Center helped to organize. The last research contribution of the Center was in the definition of the legal ontology adopted for Decode Smart Contracts and in the legal compliance of the pilots (see p. 24). Moreover, always on the legal side, a research for TIM, the main Italian Telecommunication company was carried on, on the laws of connected drones controlled by the network. The project focused on the legal framework for Unmanned Aircraft Systems operations and the main issues raised by drone operations in urban contexts and it included an analysis of the evolving European and Italian legal framework for UAS operations in urban scenarios, with particular attention to privacy constraints and measures, and an analysis of experimental use-cases from EU Member States (see p. X). Instead, focussing more on computer

Francesco Ruggiero

*Communication Manager
(until September 2019)*

Francesco Ruggiero is the founder of the literary group sparajurij and is in the editorial board of the journal "Atti Impuri". He is specialized in contemporary Italian literature. He is the author of literary reportages for the journal "Il Reportage" and co-author of the book *Viaggiatori nel freddo. Come sopravvivere all'inverno russo con la letteratura*, published in 2015.

Anita Botta

*Communication Manager
(from October 2019)*

Anita Botta holds a master's degree in Communication and Media Cultures in 2019 at the University of Turin. From October 2019, she oversees communication and press office at the Nexa Center, keeping contact with media and following Nexa's image on social networks.

Giovanni Garifo

IT Manager

Giovanni Garifo graduated in December 2019 in Software Engineering at the Politecnico di Torino with a master thesis titled "*Deep Learning on Academic Knowledge Graphs*", where he showed how advanced deep learning algorithms for graphs entities embedding and semantic web technologies can be used to empower a recommendation systems aimed at the academic community of the Politecnico. He joined the Nexa Center in January 2017 as IT Manager and Software Developer. He is the Lead Software Developer behind "Geranium", a search engine for the exploration of the academic community of the Politecnico di Torino built using Semantic Web and Deep Learning technologies. His main research interests are in web technologies and machine learning applied to semantic graphs.

science, a research on payment channel networks for blockchain scalability was carried on. The aim was to analyze capabilities and limitations of payment channel networks. To accomplish with this goal, CLoTH was developed, a simulator for payment channel networks. CLoTH simulates the execution of payments on a payment channel network and produces performance measures such as probability of payment failures and average payment time. CLoTH is a valuable tool to identify issues, analyze solutions and steer future developments of payment channel networks (see p. 25).

EDUCATION

In the field of "Education", the Nexa Center continued to coordinate the Erasmus+ project Edu-Hack (see p. 29), that intends to support teachers' professional development through open online courses, by increasing their digital skills in creating innovative learning and teaching approaches and tools. After experimenting courses on an online collaborative platform created by the Nexa Center, one online hackathon was organized at the Politecnico of Turin, so that teachers met face to face and created new useful digital tools for their professional activities. The project will come to an end by august 2020.

Moreover, to help Politecnico of Turin increase its awareness on the research that is taking place inside of it, the development of the Geranium platform was continued (see p. 30). The aim was to reduce the barriers for accessing scientific publications by citizens and to create new collaboration opportunities between researchers. The first achievements of the project are a novel academic Knowledge Graph, a search engine to explore the publications of PoliTO researchers and a recommendation system empowered by deep learning technologies. An alpha version of the Geranium platform is available at: https://geranium.polito.it/

INSTITUTIONAL NETWORKS

Beyond the work done in the four working areas mentioned above, the Nexa Center participated in four important institutional networks, that are the Global Network of Internet & Society Research Centers (https://networkofcenters.net/centers), the Global Network Initiative (https://globalnetworkinitiative.org/) and CINI - Laboratory for Informatics and Society (https://www.consorzio-cini.it/index.php/it/laboratori-nazionali/lab-informatica-e-societa) and Scienza Nuova (https://labont.it/areas/scienza-nuova/). The main novelty is Scienza Nuova, an interdisciplinary research center that keeps together scholar of the University and of the Politecnico of Turin, with the aim of working together to define the meaning and role of digital technology in our times. The Nexa Center is one of the co-founders of Scienza Nuova and prof. Juan Carlos De Martin is its vice director (see p. 34). The other main novelty, for what concerns the institutional networks, is that prof. De Martin is no more the director of the CINI lab on Internet and Society (see p. 35), having left this role to prof. Viola Schiaffonati of the Politecnico of Milano, who is a Nexa Center fellow.

TEACHING

As to its teaching activities, further than the usual Digital Revolution (see p. 37), the undergraduate course at the Politecnico di Torino, with the aim of providing students with the multidisciplinary knowledge required to understand the digital revolution, and of teaching them practical online-world skills, last year the Nexa Center launched a new course for the master students of Politecnico di Torino, Digital Technologies and Society (see p. 37), which aimed at raising awareness on what it means to be an informatics engineer in the age of AI and algorithms (examples of the topics covered are professions and code of ethics, history of computers and internet,

interpretative models of technology, ethical and policy issues in information systems, data bias, algorithm fairness). The students who enrolled in 2019-20 were 40 and some of them have become temporarily part of the Nexa Center staff and helped to conduct some of the researches mentioned in this executive summary, in particular the ones on Geranium and on AI ethics for TIM. Moreover, Data Ethics and Protection (see p. 38), a Master Course of Science in Data Science and Engineering, was launched. The aim was to give students an increased awareness of the role of data scientists and data experts in society, and a better understanding of the main challenges that they face in developing innovative data-driven products and services. The students who enrolled were 164 and, due to the Covid-19 global emergency, they attend classes remotely.

Out of the Politecnico di Torino, instead, the Nexa Center provided a course called New Media Languages (see p. 39) for the undergraduate students of the eCampus on-line University, focusing on how intermedia and transmedia communication strategies, typical of nowadays digital media context, influence the formation and the functioning of our culture. An important part of this course is on digital media and democracy. In Riconnessioni, whose goal is to support teachers in bringing technological, organizational and didactic innovations in primary and junior high schools, the Nexa Center participated by organizing and teaching "Essere digitali" (www.riconnessioni.it/notizie/laboratori/essere-digitali/), in which teachers are provided with an overview of the historical roots of the current digital revolution and of the latest technological developments. The same contents of this course were also taken to the librarians who work in the public libraries of Turin, while a version of them more suited for the work of journalists was taken to the Master School of Journalism at the University of Torino (https://www.mastergiornalismotorino.it/). Finally, in Big Dive, a five-week training program organized by the consortium Top-IX, to provide the key technical skills needed to dive into the big data universe, including some multidisciplinary knowledge useful to extract value from data, Antonio Vetrò gave a lecture on "Formalizing (and achieving?) fairness in machine learning".

FUNDING

Even if last year a big effort was devoted to the funding activities, none of the eight projects submitted to the EU were funded, nor the ones submitted to Google and to the Knight Foundation. In 2019-20 only one other project was submitted to the EU, CLIKC (see p. 49), due to the uncertainties taken from the pandemic situation.

ORGANIZATION AND COMMUNITY

As to the organizational aspects, there was a new entry in the Staff: Anita Botta substituted Francesco Ruggiero in the role of Communication Manager. Antonio Santangelo became a tenured Assistant Professor in Semiotics at the University of Turin and left the Politecnico, holding *ad interim* the role of Nexa Center Executive Director. Marco Conoscenti finished his phd and became part of the staff, collaborating to some research projects.

A special mention must go to the community activities, as in September 2019, the Nexa Fellows met for a weekend in Avigliana, to talk informally about the present and the future of the Center and to discuss topics of pressing relevance linked to the relationship between technology and society (labor market, the power of platforms, blockchain, countervailing powers of tecno-capitalism). There they decided to work on an ambitious project: trying to write a collective book on digital revolution, as a sort of a manifesto the Nexa Center vision upon it. The seminars to collect ideas and to compare the positions of all the Fellows who want to participate in the initiative are still going on.

STAFF

Giuseppe Futia

Ph.D. Student

Giuseppe Futia is currently a Ph.D. student at the Nexa Center for Internet & Society. His research interests focus on the semantic modeling and integration of heterogeneous data sources, employing Graph Neural Networks. He is currently the technical supervisor of the "Geranium" project, a semantic platform to explore the Politecnico di Torino publications. He is also the main developer and the project manager of the TellMeFirst project, a tool based on Wikipedia for the semantic classification and enrichment of textual contents. He is currently assistant of Prof. Juan Carlos De Martin within the Digital Revolution course of the Politecnico di Torino.

Elena Beretta

Ph.D. Student

Elena Beretta received the M.Sc. in Cooperation, Development, and Innovation in Global Economy from the University of Turin in September 2016, working on an experimental thesis that investigates the diffusion of innovation by agent-based models. In June 2017 she earned a second level master's degree in data science for Complex Economic Systems at the Collegio Carlo Alberto in Moncalieri (TO). Since November 2017, she collaborates as a Ph.D. student with Nexa Center for Internet & Society at the Politecnico di Torino, working on a project on Data and Algorithms Ethics under the supervision of Prof. Juan Carlos De Martin

Giacomo Conti

*Junior Research Fellow
(from December 2019)*

Giacomo Conti is graduated in Law with a thesis on contractual liability for defective software. He works at the Nexa Center for Internet & Society supporting the researches on AI and Drones in Telecommunications (TIM projects). His research interests include laws studies concerning contemporary technologies. He is a member of the Order of Journalists of Piedmont since 2016.

OUTREACH

Finally, as to the outreach work, the 11th annual conference of the Nexa Center was organized in December 2019, with the title The transformation of work in the digital age (https://nexa.polito.it/conf2019). The Nexa Center also contributed to organize the final public meeting of the DECODE project in Turin, together with Nesta Italia (https://decodeproject.eu/events/our-data-our-future-radical-tech-democratic-digital-society).

LOOKING AHEAD

Looking ahead, the Nexa Center will go towards some changes in the future, as it will have to find a new Executive Director and maybe also a new Managing Director, as this latter role is much connected with the former. It will also have to think again about how to find funding for its researches, in a context that will be uncertain, due to the coronavirus crisis. For sure, it will continue its trajectory towards interdisciplinarity and connection with human sciences, thanks to projects such as SUSST, Biennale Tecnologia and Scienza Nuova. Nevertheless, it will not lose its roots in computer science, as a new phd has started on AI and data biases and as Antonio Vetrò and Juan Carlos De Martin are giving new courses at Politecnico.

Nexa Center
for Internet & Society

Nexa Annual Story

June 2019

June 2019

Nexa Center Trustees meet in Turin for the Annual Board

July 2019

The Nexa Center hosts its first summer school, titled «AI: towards a critical utopia»

September 2019

The 2° Nexa Fellows Weekend takes place in Avigliana (Torino)

October 2019

Marco Conoscenti receives his PhD in Computer Engineering with a dissertation titled «Capabilities and Limitations of Payment Channel Networks for Blockchain Scalability»

November 2019

The first edition of «Festival della Tecnologia» takes place at the Politecnico di Torino

November 2019

The Decode Symposium, an event on the future of digital sovereignty organized by the Decode Project, takes place in Turin

December 2019

The 11° Nexa Conference on «The trasformation of work in the digital age» is hosted at the Politecnico di Torino

January 2020

The second training path of the Edu-Hack project officially starts at the Politecnico di Torino

March 2020

The Nexa Center starts to host its dissemination events online, the Nexa Lunch Seminars and the Nexa Wednesdays, in response to the COVID-19 pandemic

April 2020

The Eduhackathon, an hackathon which is part of the Edu-Hack Project learning path, is held using self-hosted online meeting tools

May 2020

The results of a study for the evaluation and comparison of Open Source Software for public administrations are presented during the 129° Nexa Wednesday

May 2020

Milano 12/06/2019

Antonio Santangelo

Jobless society forum Feltrinelli Foundation

Roma 04-05/07/2019

Juan Carlos De Martin

Lecture at the «Scuola di Formazione Frattocchie»

Avigliana 13/09/2019

M. Plazio, S. Fenoglietto

Visit at the Certosa 1515 for the 2° Nexa Fellows Weekend

Avigliana 21-22/09/2019

F. Ruggiero, M. Conoscenti, M. Plazio, E. Beretta, G. Garifo S. Fenoglietto, J.C. De Martin, A. Santangelo, A.Vetrò, G.Futia

2° Nexa Fellows Weekend

Lovanio 23-25/09/2019

S. Fenoglietto, M. Plazio

Edu-Hack Project consortium meeting

Milano 24/10/2019

Antonio Santangelo

«Orientati al futuro 2» at Ambrosetti

Firenze 04/12/2019

Juan Carlos De Martin

Meeting "La vita nel tempo di internet"

Milano 27/01/2020

Juan Carlos De Martin

Meeting with Roberto Polillo, President of the P&R Foundation, to discuss the sponsorship of Biennale Democrazia

Camogli 16/06/2019

Juan Carlos De Martin

Contribution to the conference "Cittadinanza digitale. Un diritto fondamentale", of the Rousseau association

Roma 12/09/2019

Juan Carlos De Martin

Meeting of the Treccani scientific council

Milano 19/09/2019

Antonio Santangelo

Workshop «Digital discriminations and Artificial Intelligence"

Roma 24/09/2019

Antonio Vetrò

Study day titled «Intelligenza artificiale, sicurezza, responsabilità, etica» at Segretariato Generale della Difesa e degli Armamenti

Roma 30/10-06/11/2019

A. Vetrò, M. Conoscenti

Meeting at Agenzia per l'Italia Digitale (AGID)

Roma 05/12/2019

Juan Carlos De Martin

Partecipation at the ethic board of the Consiglio Nazionale delle Ricerche (CNR)

Milano 05/02/2020

Juan Carlos De Martin

Meeting of the CINI Laboratory on Informatics and Society

Nexa in the World

►**Map details**

■ Italy (20)   ■ USA (1)   ■ Belgium (1)

Boston 24-30/09/2019

Juan Carlos De Martin

Research meetings at Harvard University

Verona 16-17/11/2019

Antonio Vetrò

Coordination of the panel «Il governo della digitalizzazione e il ruolo delle università» at the Festival del Futuro

Trento 16-17/12/2019

Juan Carlos De Martin

Partecipation a the event "Worldviews. When AI meets geopolitics and religious studies" at Fondazione Bruno Kessler (FBK)

Roma 06/02/2020

Juan Carlos De Martin

Partecipation at the ethic board of the Consiglio Nazionale delle Ricerche (CNR)

Venezia 11-13/10/2019

Juan Carlos De Martin

International seminar «The Data Driver Society», part of the Aspen Seminars for Leaders

Venezia 02-03/12/2019

Marco Conoscenti

Partecipation at the laboratory «Attuazione delle linee guida su acquisizione e riuso di software per le Pubbliche Amministrazioni»

Trento 16-18/12/2019

Elena Beretta

Meeting with PhD supervisor at Fondazione Bruno Kessler (FBK)

Nexa Center
for Internet & Society

1. Artificial Intelligence and Society

1.1 Data and Algorithm Ethics

Data and Algorithm Ethics is a Ph.D. research project started at the Nexa Center for Internet & Society in collaboration with Fondazione Bruno Kessler (FBK)

Project Website	https://nexa.polito.it/data-and-algorithm-ethics
Status	ongoing
Period	November 2017 - November 2020
Funding	69.500 €
Funding organization	Fondazione Bruno Kessler (FBK)
Persons in charge	Elena Beretta (Ph.D. Student)

Data and Algorithm Ethics is a Ph.D. research project started at Nexa Center for Internet and Society in collaboration with Fondazione Bruno Kessler. The main goal of the research project is to investigate the impact of machine learning algorithms in decision-making processes, combining data analytics techniques with an epistemological approach from social sciences and humanities.

Background

We are living in an historical age in which automated decision making are rapidly spreading in nowadays economies transforming several domains of our daily life. Over the last few decades, such tools have become progressively complex by exploiting an ever-growing amount of personal and proxy data through increasingly sophisticated massive profiling techniques. Especially, ranking systems are one of the most relevant technologies in the transformation we are witnessing and there is almost nothing today that is not expressed in a ranking form: people, products, jobs, opinions. Ranking is therefore one of the predominant forms by which both online and offline software systems present results in a wide variety of domains ranging from web search engines to recommendation systems. Despite they have been widely employed since decades in Information Retrieval domain, they have recently come back at the cutting edge thanks to the explosive growth of computational power and data availability. The main task of ranking systems is to find an allocation of elements to each of the n positions so that the total value obtained is maximized. The success of an element and its exposure are strongly dependent by its position; a number of recent researches have shown that ranking algorithms whose only task is to maximize utility do not necessarily lead to fair or desirable scenarios, causing forms of algorithmic biases that in some cases can lead to serious social implications. Web search engine results that inadvertently promote stereotypes through over-representation of sensitive attributes such as gender, ethnicity and age are an example. For this reason, the study of fairness and bias in ranking algorithms is a fundamental task in this transformation era.

Objectives

In recent years, several formal definitions of fairness have been suggested by the automated-system community, especially by the machine learning one. Despite the increasing influence of rankings on our society and economy, fairness in ranking systems is still a poorly explored ground. The aim of the research is to contribute to the debate on fairness in machine learning, and in particular in ranking systems domain. Main goals are briefly summarized below: i) discussing the impact that recent proposed fairness formalizations may have on societies; ii) proposing new solutions to re-calibrates ranking outcomes subject to fairness constraints; ii) studying the trade-off among fairness and traditional ranking systems utility.

Results

The main achievements of this PhD research project are briefly resumed:

Journal Papers:

(i) Antonio Vetrò, Antonio Santangelo, Elena Beretta, Juan Carlos De Martin. (2019) *AI: from rational agents to socially responsible agents*, Digital Policy, Regulation and Governance, https://doi.org/10.1108/DPRG-08-2018-0049

Conference Proceedings:

(i) Elena Beretta, Antonio Santangelo, Antonio Vetrò, Bruno Lepri, Juan Carlos De Martin. (2019) *The Invisible Power of Fairness. How Machine Learning Shapes Democracy*. In: Meurs MJ., Rudzicz F. (eds) Advances in Artificial Intelligence. Canadian AI 2019. Lecture Notes in Computer Science, vol 11489. Springer, Cham. https://doi.org/10.1007/978-3-030-18305-9_19

(ii) Elena Beretta, Antonio Vetrò, Bruno Lepri, Juan Carlos De Martin. (2018) *Ethical and Socially Aware Data Labels*, Information Management and Big Data. SIMBig 2018. Communications in Computer and Information Science, vol 898, pp. 320-327, Springer, Cham. https://doi.org/10.1007/978-3-030-11680-4_30

Working Paper:

Nexa Center, *Fairness e Machine Learning*, December 2018, Working paper nr 2/2018.

Nexa Center
for Internet & Society

1.2 Ethics and Politics of Algorithms

A truly interdisciplinary project that keeps together the engineers and the philosophers of the Nexa Center and the philosophers of the University of Turin

Project Website	N/A
Status	ongoing
Period	January 2019 - present
Funding	in-kind
Funding organization	N/A
Persons in charge	Antonio Santangelo (Coordinator), Antonio Vetrò (Senior Researcher), Elena Beretta (Ph.D. Student)

The Nexa Center for Internet & Society has started a collaboration with the scholars and researchers of the University of Turin led by Prof. Maurizio Mori, who teaches Moral Philosophy and Bioethics. The aim is to strengthen the Nexa Center's research line on philosophy and ethics of technology, with a particular - even if not exclusive - focus on AI.
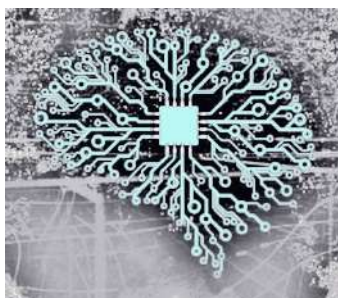
Background

Since 2017, with the launch of its Phd research project on data and algorithm ethics, in collaboration with Fondazione Bruno Kessler (FBK), the Nexa Center has focused its attention on the ethical consequences of the use of big data and AI.

Moreover, with SUSST, Nexa Center has decided to contribute to the opening of Politecnico of Turin to humanities, convinced of the necessity to study the social and cultural issues related to technology. At the same time, the research group on moral philosophy guided by Prof. Mori, that has been working for years on the relationship between technology and human life, especially in the field of bioethics, was looking for a partner to start a study on digital artifacts and their ethical implications.

Objectives

This convergence of interests has led to draw a common research program on AI algorithms, with the aim of understanding how they should be projected to be fair. However, as fairness is a multifaceted concept which may derive from very different visions of justice and of our social life, the other aim of this collaboration is to imagine what kind of society we may give birth to, if we chose a certain criterion of fairness instead of another.

As this is a matter of politics, the objective of this part of the research is to help people understand what our democracies may become, if we let AI algorithms do something we as humans use to do, taking a partial or a total control of some of our social systems, as it is starting to happen in economy, law, medicine, etc.

Some of the topics of this research are now part of ERC project called Facets, in which Antonio Santangelo is involved at the University of Turin, where he works on deep fakes and on facial recognition.

Results

The first results of this collaboration are three articles:

(i) Elena Beretta, Antonio Santangelo, Antonio Vetrò, Bruno Lepri, Juan Carlos De Martin. (2019) *The Invisible Power of Fairness. How Machine Learning Shapes Democracy*. In: Meurs MJ., Rudzicz F. (eds) Advances in Artificial Intelligence. Canadian AI 2019. Lecture Notes in Computer Science, vol 11489. Springer, Cham. https://doi.org/10.1007/978-3-030-18305-9_19.

(ii) Antonio Santangelo, I narcisi mascherati, gli eroi e noi, in M. Leone (eds), Volti virali, Facets digital press, 2020

(iii) Antonio Santangelo, Equità degli algoritmi e democrazia (forthcoming).

1.3 Semantic Modeling through Deep Learning

Reconstructing the semantics of semi-structured sources to automatically build and complete Knowledge Graphs

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Project Website	https://nexa.polito.it/semantic-modeling-deep-learning
Status	ongoing
Period	November 2016 - November 2019
Funding	69.500 €
Funding organization	Italian Ministry of Education – University and Research
Persons in charge	Giuseppe Futia (Ph.D. Student)

Semantic Modeling through Deep Learning is a PhD research project within the Nexa Center for Internet & Society. The goal of this project is to build (or refine) large-scale Knowledge Graphs (KGs), through the automatic semantic modeling of structured and heterogeneous sources. Diverse Deep Learning techniques, exploiting simple Neural Language Models (Word2Vec) and Graph Neural Networks (R-GCN), have been explored to reach this purpose. Moreover, the study on KGs and neural architectures, representing the modern implementations of symbolic and connectionist AI respectively, led to reflections on an emergent research field: the eXplainable AI (XAI).

Background

The integration of a vast amount of heterogeneous data sources is a key ingredient to build Knowledge Graphs (KGs). These labeled and directed multi-graphs encode information in the form of concepts and properties, that are formalized by a domain ontology. Large-scale KGs feed various data-driven systems developed for different purposes, from question answering to information retrieval tasks.

The generation of KGs requires the construction of a map between the attributes of a data source -for instance the fields of a CSV file- and concepts and properties defined by an ontology. This map is called semantic model. The manual generation of semantic models requires a significant effort and different domain expertises, due to the variety of data released on the Web and within private data lakes. For this reason, the automation of the semantic model construction is an essential condition to build large-scale KGs.
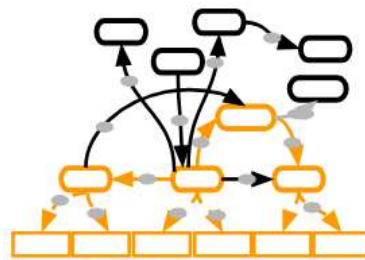
Objectives

The semantic model is formalized as a conceptual graph where leaf nodes represent the attributes of the data source and the other nodes and edges are defined by the domain ontology. Consider a CSV file with two fields respectively entitled "people" and "art pieces". The first operation in building a semantic model is to define a label (semantic type) for each of these fields, using the concepts specified by the reference ontology: for instance "Person_name" and "Art_piece_name".

The second operation is to infer the correct connection (semantic relation) between these two semantic types, for instance "is_depicted_in". The goal of this research project is to investigate how diverse neural network techniques can be adopted for the specific task of the semantic relation inference.

Results

The main achievements of this PhD research project are the following:

(i) A journal publication: "On the Integration of Knowledge Graphs into Deep Learning Models for a More Comprehensible AI—Three Challenges for Future Research" (G. Futia, A. Vetrò), Information 11 (2), 122.

(ii) The development of SeMi (SEmantic Modeling machIne - https://github.com/giuseppe-futia/semi), a system that combines a graph algorithm (Steiner Trees Detection), a neural architecture called Relational Graph Convolutional Networks (RGCNs), and a link prediction method (DistMult) for the automatic inference of semantic relations within data sources.

(iii) An under-review journal publication: "SeMi: a SEmantic Modeling machIne to build Knowledge Graphs with Graph Neural Networks", (G. Futia, A. Vetrò, JC De Martin), reporting the main features of SeMi and the position of the tool within the state of the art.

(iv) An under-review journal publication: "Modeling the Semantics of Structured Sources with Steiner Trees and Relational Graph Convolutional Net-

works" (G. Futia, A. Vetrò , G. Car-ducci, D. Allavena, JC De Martin), describing the applications and the results obtained through SeMi in different domains, from academic publications to public procurement.

(v) A conference publication: "Training Neural Language Models with SPARQL queries for Semi-Automatic Semantic Mapping" (G. Futia, A. Vetrò, A. Melandri, JC. De Martin), Proce-dia Computer Science 137, 187-

198, describing the use of neural language model called Word2Vec for the semi-auto-matic semantic type detection.

(vi) A Technical Report: "Linked Data Validity", carried out by re-searchers and students that participated in the International Semantic Web Research School (ISWS) 2018.

(vii) A conference publication: "Removing barriers to transpar-ency: A case study on the use of semantic technologies to tackle

procurement data incon-sistency" (G. Futia, A. Melandri, A. Vetrò, F. Morando, JC. De Martin) - European Semantic Web Con-ference, 623-637

(viii) A workshop publication: "ContrattiPubblici. org, a Se-mantic Knowledge Graph on Public Procurement Information" (G. Futia, F. Morando, A. Melandri, L. Canova, F. Ruggiero) - AI Ap-proaches to the Complexity of Legal Systems, 380-393.

1.4 Urban artificial intelligence
Full explores, imagines, and designs the future of global and local urban legacy embodied in city form

Project Website	https://full.polito.it
Status	ongoing
Period	April 2018 - present
Funding	22.500 € for Nexa (+ standard funding by Politecnico di Torino)
Funding organization	Future Urban Legacy Lab (Politecnico di Torino) + Nexa Center in-ternal funding
Persons in charge	Antonio Vetrò (Senior Researcher), Antonio Santangelo (Senior Re-searcher), Juan Carlos De Martin (Supervisor)

Background

Advances in AI technologies have a substantial impact on everyday lives, and major changes are expected in the fol-lowing years especially in urban context, where most of the world population currently lives. AI is playing a growing role in our lives: by automatically gath-ering and processing infor-mation from human activities, AI technologies can perform sev-eral autonomous tasks, ranging from simple one such as voice recognition, to very complex like autonomous driving.

The reliability of these tech-nologies is increasing; therefore, many human tasks today are delegated to machines, and with the fast-technological de-velopment pace, many more human activities will be auto-mated in a close future. Not-withstanding the large number of current applications of AI in everyday life, many issues are

still under debate in several re-search communities and civil society: systematic biases, lia-bility concerns, transformation of labor, are a few examples of the socio-technological chal-lenges to be faced.

Objectives

The research project aims at studying the impact of AI uses in the urban context, in relation to the social implications and the technological developments. The research is conducted in a multi-disciplinary setting, harnessing the collaboration between the Nexa Center for Internet and So-ciety and the Future Urban Leg-acy Lab (which involves seven dif-ferent engineering departments of Politecnico di Torino).

The first operational goal of the project is the creation of Digi-tal Open Urban Twin (DOUT), i.e. a platform - open in terms of li-censes of the data and adherence to open standards- that allows the co-presence of layers of data "above" the physical city, each one on a specific focus and with potentially different -but coher-ent- level of details.

The result is a "digital twin" of the city, which gives to research-ers and policy makers the possi-bility to spatially correlate and visualize, beyond the more con-solidated uses of 3D city models and 3DGIS, how urban phenom-ena/problems are distributed across different areas of the city and how they are connected each other at multiple scales. An exem-plary but not exhaustive list of ur-ban dimensions of interest are pollution, arrests, poverty, educa-tion, energy consumption, traffic flows, commercial activities.

The second operational goal of the project concerns Cities & Inequalities and it is twofold: (i) spatialize current marginalities e

inequalities in a sample of cities; ii) investigate on the role of artificial intelligence techniques and in general digital technologies in perpetuating, amplifying or reducing such inequalities.

Results

The first phase of the project ended in March 2019, when project team has delivered a feasibility study for the Digital Open Urban Twin, which summarizes the state of the art in 3-D city modelling and how requirements for the DOUT could be satisfied by existing digital tools.

The second phase of the project started with a kick off seminar in September 2019 at the Future Urban Legacy Lab FULL "Cities and inequalities (and digital technologies)" given by Antonio Vetrò, Antonio Santangelo and Francesca Governa. The work continued with the publication of a call for PhD candidates for the topic "Evaluating the impact of automated decision systems in urban contexts" (http://www.phd-dauin.polito.it/pro-posals.php#10)

1.5 Data Bias: Identification of Mitigation and Remediation Strategies, Techniques and Tools

A study that aims at investigating the impact of poor data quality and biases in the data on the automatic decisions made by software applications

Project Website	https://nexa.polito.it/data-bias
Status	ongoing
Period	November 2019 – November 2022
Funding	in-kind
Funding organization	Politecnico di Torino, Softeng research group, Nexa Center for Internet & Society
Persons in charge	Antonio Vetrò (Senior Researcher), Marco Torchiano (Nexa Fellow), Mariachiara Mecati (Ph.D. Student)

Background

Nowadays, many software systems make use of large amount of data (often, personal) to make recommendations or decisions that affect our daily lives. Consequently, computer-generated recommendations or decisions might be affected by poor quality and bias in the input data. This implies relevant ethical considerations on the impact (in terms of relevance and scale) on the life of persons affected by the output of software systems.

Objectives

The PhD proposal aims at investigating the impact of poor data quality and biases in the data on the automatic decisions made by software applications. As a minor aspect, the ethical character of algorithms and the relative effects on decisions will be also investigated. The objectives of the PhD plan are the following ones:

(i) Build a conceptual and operational data measurement framework for identifying data input characteristics that potentially affect the risks of wrong or discriminating software decisions. This goal encompasses identifying which characteristics have an impact, and the measurement procedure.

(ii) Collect empirical evidence concerning the actual impact of the measured data quality issues on automated decisions made by software systems. The evidence will be built by means of different research methods: case studies, experiments, or simulations, depending on the availability of data, software, and third-party collaborations. A key achievement is the establishment of relational links between quality issues and output bias features.

(iii) Design of mitigation and remediation strategies and specific techniques to reduce the problem. A proof of concept implementation should be provided. We anticipate not all aspects of the problem will be solvable computationally, in such cases it will be important to advance the knowledge in the area by identify explanations and provide critical reflections.

In addition, as a secondary goal:

(i) Investigate how quality of software and bias incorporated in the algorithms can contribute to flawed decisions made by software applications. (ii) If any evidence is found, investigate how this aspect is related to the previous one of data quality and bias. (iii) Design and prototyping of remediationtechniques for the problem.

Results

At the time of writing, an exploratory study has been conducted (Evaluating Risk of Discrimination in Automated Decision Making Systems with Measures of Disproportion) and submitted to the EGOV-CeDEM-ePart 2020 conference (http://dgsociety.org/egov-2020/). In this study, the authors investigated measurable characteristics of datasets which can lead to discriminating automated decisions. The final goal being to ensure a more conscious and responsible use of automatic decision-making (ADM) systems.

1.6 Artificial intelligence in TLC: ethical and privacy issues and guidance on the concept of fairness

Starting from the experience of the use of AI in TLC environment, the project covered the ethical and privacy aspects focusing on the issues of discrimination that may arise

Project Website	https://nexa.polito.it/artificial-intelligence-in-tlc
Status	concluded
Period	September 2019 – May 2020
Funding	30.000 €
Funding organization	TIM S.p.A.
Persons in charge	Antonio Vetrò (Senior Researcher), Antonio Santangelo (Senior Researcher), Eleonora Bassi (Senior Researcher), Giacomo Conti (Junior Researcher), Elena Beretta (Ph.D. Student), Flavio Emanuele Cannavò (Junior Researcher)

Background

The context of Telecom operators, as often happens, has two sides: on the one hand telecommunication systems are among the enabling technologies for the diffusion of AI solutions, on the other hand operators are themselves large users (e.g. for network automation solutions, network protection and security systems, customer interactions). The project is part of a context of ongoing transformation towards the digitalization of society and industry based on technological developments in the ICT sector. Communication networks will represent an increasingly relevant component for every industrial and governmental sector, also thanks to the development of 5G networks. This technology, in fact, is not only a radio interface and a faster and more performing network, but thanks to the use of a set of software-based technologies that make the network easily configurable and flexible, allows the development of new business models in the service offering. Big data, statistical techniques of AI and Machine Learning will be key components of 5G.

Objectives

Starting from the experience of the use of AI in TLC environment, the project covered the ethical and privacy aspects focusing on the issues of discrimination that may arise, analyzing the complex concept of equity aimed at mitigating such discrimination and examining the emerging guidelines at European and national level and the ethical codes adopted by companies. A part of the project focused on data ethics and algorithms, and the following topics: (i) Fairness and justice: mathematical statistical definitions of the concept of fairness and reflections on recommendation systems. (ii) Ethical and socially aware data labels: how to label databases, so that it is clear what has been done to consider the ethical issues raised by their use. (iii) Ethical guidelines for the development of AI: analysis of the documents produced by the various committees set up by States and the European Commission. Another part of the project focused on the following legal aspects: (i) "AI: between corporate governance and legal responsibility in the telecommunications sector." (ii) Examination of use cases in TIM. (iii) Problems of legal liability: contractual and non-contractual. (iv) Governance between business ethics, organizational processes, and corporate responsibility. (v) The role of codes of ethics. (vi) Possible cases.

Results

The results of the collaboration were the following: (i) A selection and analysis of real cases of discrimination resulting from the incorrect design of automatic systems and/or decision-making algorithms or the use of databases with bias problems, with a focus on the European context. (ii) The identification of metrics for the measurement of bias in databases, which can be used as "risk labels" of discrimina-tion resulting from their use. (iii) A legal analysis of philosophi-cal, legal principles, guidelines, and codes of ethics concern-ing the development of Artifi-cial Intelligence systems. The delivera-bles have been presented and discussed with two workshops at TIM. In addition, the results of the legal part have been presented at the 77° Nexa Lunch Seminar (https://nexa.polito.it/lunch-77).

2. Technology and Society

2.1 Festival della Tecnologia

A series of wide-ranging national and international appointments aimed at proposing a broad reflection on the relationship between technology and society and at strengthening the dialogue between universities and civil society

Project Website	https://2019.festivaltecnologia.it
Status	concluded
Period	November 7th-10th, 2019
Funding	in-kind
Funding organization	Politecnico di Torino
Persons in charge	Juan Carlos De Martin (Coordinator), Mattia Plazio (organization assistant), Antonio Santangelo (organization assistant)

Background

On the 160th anniversary from its foundation, from November 7th to November 10th 2019, under the coordination of Prof. Juan Carlos De Martin, Politecnico di Torino hosted the first edition of Festival della Tecnologia, a series of wide-ranging national and international appointments aimed at proposing a broad reflection on the relationship between technology and society and at strengthening the dialogue between universities and civil society. In times of social, cultural and technologic turbulence, Festival della Tecnologia has been conceived, from the beginning, as one of the first events specifically devoted to a dialectic reflection on technology, its role on society and on the related future challenges.

Objectives

The Festival is aimed at describing technology through society and people through technology, with the adoption of multiple languages: from science to literature, cinema, art, music, sport. Politecnico di Torino promoted the Festival not only as its own direct expression but also as the expression of a vast and widespread network of partners (https://2019.festivaltecnologia.it/collaborazioni), including national and international research institutes, as well as public institutions, private companies, experts and high-level guests. Each of these contributions enriched a vast program with initiatives that have extended from all PoliTo campuses and venues to the entire city, realizing a widespread and shared Festival (https://2019.festivaltecnologia.it/sedi). One core objective of the Festival is that of opening Politecnico di Torino to a transversal public, maximizing its impact on society and promoting debates and in-depth analyses of nowadays most relevant challenges. Festival della Tecnologia wants to be a contribution of Politecnico di Torino to the City of Torino, to Piedmont and to Italy: a key element of its civic role and of its strategy of shared knowledge. The Festival is therefore aimed at promoting the image of Torino as the city of technology.

Program

Festival della Tecnologia embraced Politecnico di Torino and the entire city with various events (https://2019.festivaltecnologia.it/programma), starting from the inauguration of November the 7th, that has seen the extraordinary participation of Joseph Stiglitz, Nobel Prize in Economic Sciences. The reflection on technology's impact on our society has been developed through an innovative and shared format, that proposed an open, transversal and informative Festival. Panels, lectures, laboratories, concerts, plays and exhibitions involved scientists, writers, musicians, philosophers, journalists and actors with the specific purpose of analyzing the relationship between technology and society through the adoption of diverse languages and artistic forms: literature, music, environment, cinema, art, etc. The Nexa Center, one of key partner of Festival della Tecnologia, contributed to this large event collaborating to the organization of several meetings which involved its large community of scholars and researchers (https://nexa.polito.it/festival-tecnologia-19).

Results

Festival della Tecnologia was a great success with over 50,000 estimated attendees in 4 days, 160 meetings, 23 locations involved, more than 50 collaborations activated, 30 meetings spread throughout the territory (Turin, Alba, Ivrea and Vercelli), 14.000 students of Politecnico di Torino that attended the meetings and a significant presence on national press (https://2019.festivaltecnologia.it/rassegna-stampa). Precisely due to its success and the large interest aroused, Festival della Tecnologia becomes, now, a biennial appointment, alternating with another major event promoted by the City of Torino, Biennale Democrazia, with which Biennale Tecnologia has a natural closeness of objectives and purposes. The first edition of Biennale Tecnologia (https://www.biennaletecnologia.it/) will take place from 12 to 15 November 2020. The new program is being defined

2.2 SUSST – Scienze Umane e Sociali per le Scienze e la Tecnologia

A project that aims at (re)opening a fruitful dialogue between the engineering sciences and the humanities in order to find innovative solutions to nowadays challenges in the field of engineering.

Project Website	https://susst.polito.it/
Status	ongoing
Period	2018 – present
Funding	in-kind
Funding organization	Politecnico di Torino
Persons in charge	Juan Carlos De Martin (Coordinator)

Background

The advancement of polytechnic culture requires an increasing interaction with human and social sciences. This fruitful collaboration would be a fundamental tool for the articulation of innovative solutions to nowadays challenges, especially in the field of engineering.

Due to this awareness, Politecnico di Torino, under the guide of Prof. Juan Carlos De Martin, has founded, in October 2018, the SUSST group of work, which is rooted in a pioneering experience that the Istituto Superiore di Scienze Umane started 20 years ago, and which treasures the existing experiences of PoliTo's Athenaeum (Dipartimento Interateneo di Scienze, Progetto e Politiche del Territorio - https://www.dist.polito.it/ and Dipartimento di Ingegneria Gestionale e della Produzione - https://www.digep.polito.it/).

Objectives

The core objective of SUSST group is identifying practical solutions that would permit PoliTo's alignment with the best Northern-European Polytechnics, which in the last 20 years have been renewing their teaching offer, their research activities and their third mission. Following a well-established international path, they have been introducing the precious contributes of human and social scientists that operate in the field of science and technology. These actions are based on three fundamental assumptions:

(i) the need to foster the social impact of technical universities, adopting an interdisciplinary approach and a specific focus on nowadays controversies and challenges.
(ii) the will to shape high-level professionals and engineers, more aware of technology's ethical, environmental, and social impact.
(iii) the aim to strengthen student's critical thinking and, more precisely, their overall comprehension of techno-scientific context in which they act.

The inclusion of social and human sciences into technical universities would lead to a less sectorial teaching approach, contributing to the education of more flexible and high-skilled professionals. Being aware of the need of dialogue and confrontation with other Italian universities that are equally interested to renewing their teaching, SUSST group includes various professors and experts:

Juan Carlos De Martin (coordinator); Giovanni Durbiano (Politecnico di Torino); Giovanni Vincenzo Fracastoro (Politecnico di Torino); Vittorio Marchis (Politecnico di Torino); Maurizio Ferraris (University of Turin); Peppino Ortoleva (University of Turin); Cristina Becchio (IIT and University of Turin); Paolo Volonté (Politecnico di Milano); Luca De Biase (journalist and writer).

Results

Hereafter, the first results and the outline program of SUSST activities:

(i) November 2018-March 2019: mapping of national and international initiatives and on-site visits in Paris (École Polytechnique, École Centrale, École des mines, CNRS, ecc.) and in Lausanne (EPFL).
(ii) April-May 2019: meetings with the main cultural areas of PoliTo and collection of further contributions.
(iii) May 31, 2019: public meeting about national and international best practices at PoliTo's Aula Magna.
(iv) July 2019: first draft of the final report.
(v) September 2019: delivery of the final version of the report to PoliTo's Rector.
(vi) From January 2020: implementation of the decisions of PoliTo's governing bodies.

Nexa Center for Internet & Society

2.3 University in the Digital Age
Re-thinking the University's role in Society in the Networked Age

Project Website	http://www.universitafutura.it
Status	ongoing
Period	2009 - present
Funding	N/A
Funding organization	N/A
Persons in charge	Juan Carlos De Martin

At February 2017, Juan Carlos De Martin, co-director of the Nexa Center, published his work on University in the digital age which he had started in 2011 during a stay at Harvard University. The book, titled: "Università futura. Tra democrazia e bit", was published by Codice edizioni (under a Creative Commons License).

Background

This research originated in particular from the intuitions of Prof. Charles Nesson from the Berkman Center for Internet & Society (https://cyber.harvard.edu/) at Harvard, who clearly saw – several years ago – the challenges and the opportunities that the cyberspace posed to universities, also in terms of their civic role.

The first tangible result of these considerations, as elaborated at the Nexa Center, was the international conference University and Cyberspace: Reshaping Knowledge Institutions for the Networked Age (www.communia2010.org/). The conference was organized by the Nexa Center together with the Berkman Center of Harvard and also represented the last public event of the Communia European Thematic Network (www.communia-project.eu/) on the Digital Public Domain.

Objectives

"Università futura, Tra democrazia e bit" explores the (civic) role of Universities in the light of five global challenges for the 21st century: environmental, technological, economic, geopolitical, and democratic. Universities are entrusted with the increasingly important responsibility of creating, sharing, and fostering the use of knowledge, and thus are the recipients of tremendous investments of time, money, space, and authority.

As we progress further into a networked age, our knowledge institutions are challenged by society to become a driving force to create and disseminate knowledge, using innovative approaches derived from and for the networked world.

UNIVERSITÀ FUTURA
TRA DEMOCRAZIA E BIT

JUAN CARLOS DE MARTIN

Results

"Università futura, Tra democrazia e bit" has been discussed in public in several occasions, including the Berkman Klein Center for Internet & Society at Harvard University, the Senate of the Italian Republic, the Istituto Svizzero in Rome,

the Politecnico of Torino, the University of Torino, the Politecnico of Milano, the University of Milan and the University of Naples Federico II.

In autumn 2017, the book "Università futura" was read and discussed by several secondary school classes. The students used a traditional educational method, as well as the social reading app Betwill (https://www.twlettera-tura.org/2015/05/betwyll/), fostering empathy in a digital environment. At the end of the project, Prof. De Martin met the students in a public occasion at Talent Garden, a coworking and learning space, in Turin.

In August 2018, Juan Carlos De Martin, as Rector's Delegate for Culture and Communication of the Politecnico di Torino, participated to the Conference: "68 and beyond. Schools and universities in a changing world: ancient challenges in a new world?", held in Rimini (https://www.meet-ingrimini.org/eventi-totale/68-e-oltre-scuola-e-universita-in-un-mondo-che-cambia-sfide-antiche-in-un-mondo-nuovo/).

During the reporting period, there have not been official occasions for presenting the book, but Università futura. Tra democrazia e bit continues to be of inspiration for the promotion of a new idea of university inside and outside the Politecnico di Torino.

2.4 Assessment of Open Source Software for Public Administrations

A project that defines a procedure for assessing and comparing open source software, both technically and economically, to assist Public Administrations in adopting it

Project Website	https://nexa.polito.it/open-source-assessment
Status	concluded
Period	September 2019 – December 2019
Funding	38.610 € (VAT excluded)
Funding organization	AgID (Agenzia per l'Italia Digitale)
Persons in charge	Antonio Vetrò (Senior Researcher), Marco Conoscenti (Researcher)

The project consisted in defining a procedure for assessing and comparing open source software, both technically and economically. Such procedure aims to assist Public Administrations in acquiring open source software. The procedure was defined by the Nexa Center in cooperation with AgID (Agenzia per l'Italia Digitale) and with the help of the Piedmont Region.

Background

In May 2019, AgID published the guidelines on acquisition and re-use of software for the Public Administration. The guidelines aim to help the Public Administrations in reusing and acquiring software, promoting the share and use of open source software.

In particular, the guidelines specify that, when searching for software, the Public Administrations must first take into consideration and assess software already used and shared by other Public Administrations, then open source software, and eventually -only if any suitable software has been found in previous steps- off the shelf software can be considered.

Objectives

In this context, the Nexa Center for Internet and Society, in cooperation with AgID, defined a procedure to assess and compare open source software. The procedure fully conforms to AgID guidelines. The procedure consists first of a technical and economic assessment of the software solutions, secondly, all the software solutions under evaluation are compared according to results of the assessment previously performed, and finally a rank from the most to the least satisfactory solution is produced.

Regarding the technical assessment, each software solution under evaluation is quantitatively assessed using the assessment criteria defined in AgID guidelines. Specifically, these assessment criteria are: coverage of functional and non-functional requirements, interoperability, protection of personal data, security, accessibility, the presence of a maintainer, the presence of support for installation, the dependencies from other software, the competence of Public Administration in the use of the software, the number of Public Administrations interested in the software, and the vitality of the software project.

Regarding the economic assessment, the Total Cost of Ownership (TCO) of the software is estimated. To do so, a new TCO model was produced,

which resulted from a review of the scientific literature on TCO, an analysis of some TCO models available online and feedback received from the Piedmont Region. The TCO model so formulated takes into consideration both capex and opex costs of acquiring a software. After each software under evaluation is economically and technically assessed, in the proposed procedure a multi-criteria decision-making algorithm is adopted to compare all the software solutions. As input, the algorithm takes the results of the economic and technical assessments and the weights of the assessment criteria (which were also defined in this work); as output, it produces a rank from the most to the least satisfactory software solution.

Finally, a possible extension of the software assessment criteria was proposed in this work. In fact, it was proved that there exists a mapping between the assessment criteria of AgID guidelines and the software quality characteristics of the ISO/IEC 25010:2011 standard (system and software quality models). Therefore, it was proposed to also include the ISO/IEC 25010:2011 quality characteristics in the assessment criteria, at the discretion of the interested Public Administration.

Results

The   proposed   procedure

was tested by 7 Public Administrations in real cases. To analyze the effectiveness and ease of use of the proposed procedure, these Administrations were asked to reply to a survey. The main results of the survey are as follows. Among the 7 Public Administrations, one considered the procedure difficult to conduct, while the remaining ones considered it of medium difficulty or easy to compile, with respect to an average difficulty of their normal tasks. 6 over 7 Public Administrations completed the procedure in less than 4 hours and the remaining one between 4 and 8 hours.

The main outputs of this project are: (i) a document describing the proposed procedure for assessing and comparing open source software; (ii) a spreadsheet, which allows Public Administrations to practically conduct the assessment and comparison procedure; (ii) the weights to be assigned to the assessment criteria, according to the category of software under evaluation.

The results of the project are also presented at the 130° Nexa Wednesday.

3. Internet Power and Rights

3.1 Decode – Decentralised Citizens Owned Data Ecosystem (EU Project)

DECODE is a research and innovation project that won the Horizon 2020 ICT Call 2016

Project Website	https://www.decodeproject.eu/
Status	ongoing
Period	December 2016 - December 2019
Funding	4.987.673 € (185.125 € for Nexa)
Funding organization	EU (Horizon 2020)
Persons in charge	Juan Carlos De Martin (Coordinator), Marco Ciurcina (Senior Researcher), Eleonora Bassi (Senior Researcher), Selina Fenoglietto (Researcher)

Decode aims to increase digital sovereignty of European citizens by enabling them to produce, access and control their data and exchange contextualized information in real-time, and in a confidential, and scalable manner.

Decode will develop a modular privacy-aware IoT hub with a free and open source operating system backed by a state-of-the-art distributed ledger technology (DLT) infrastructure supporting smart-contracts and privacy protections.

Background

Today's Internet is becoming increasingly centralized, slowing innovation and challenging its potential to revolutionize society and the economy in a pluralistic manner. Decode will develop practical alternatives through the creation, evaluation and demonstration of a distributed and open architecture for managing online identity, personal and other data, and collective governance in a citizen-friendly and privacy-aware fashion.

Strong digital rights that makes it possible for data subjects to determine access rights to their information through flexible entitlements and open

standard-based agreements regarding data governance (on the model of Creative Commons licenses) will be woven into the technological architecture.

Objectives

The Decode project develops a distributed and privacy-aware architecture for decentralized data governance and federated identities. The platform adopts Attribute-Based Cryptography (ABC) to sensitive information, ideas from Certificate Transparency (CT) for identification, and Blockchain Technology for federated data access, distribution and resilience.

The Decode architecture is fully decentralized and allows for a flexible and extensible data governance that can be applied to different regimes of data ownership and privacy, implemented through smart contracts that will define access to subsets of data for specific use(s) granted to specific subject(s), according to a defined ontology.

Decode allows the consensual use of personal data in anonymous form for personalized services and applications that may be authorized to manage it. This mechanism defines the rules for data flow among any type of data sets or indexes provided by data aggregators.

Once the access is granted the data can be processed by

services subscribed to its feed and entitled to access it. It can be collected by any of these services or IoT applications. The Decode platform aims to integrate the technical, economical and legal frameworks, managing common data, public data and personal data.

The results of the project (smart rules, platform specifications, protocols, ontology, semantic specifications) will be released under a Free and Open Source Software (FOSS) license. General Decode's objectives in which Nexa Center is involved are:

(i) Create actionable legal and governance tools for European citizens, companies and cities running on a distributed cryptographic ledger that enable disruptive commons-based business models intrinsically respectful of privacy and digital sovereignty;

(ii) Empower citizens to control and own their data;

(iii) Contribute to an open standardization process in the fields of data portability, federated or distributed identity management, blockchains, and smart rules.

Results

The project ended on December 2019. The Nexa Center for Internet and Society has been responsible for the task to analyze the legal and ethical frameworks involved in the

adoption of the Decode technology, including the cases where the processing of personal data is involved. In October 2018, the document "Legal Framework for digital commons Decode OS and Legal Guidelines" was published. It concerns the review of the legal sets of rules involved by the creation of digital commons including (or not) personal data through the use of the Decode OS technology, and guidelines to be practically used for the development of the Decode OS.

In October 2018 was re-leased the document "Licensing of digital commons including personal data", that was updated in August 2019. The updated version provides a review of the licensing options for data commons, even cases in which data commons include personal data, and the design of a set of smart rules to be adopted (also within the context of the DECODE pilots) when personal data are processed. In addition, the document offers an initial set of smart rules to be adopted by the pilots or other services based on DECODE OS in order to strength users control on data commons, a table for evaluating the compatibility of free licenses to be adopted for DE-CODE artefacts, and a Data Commons Privacy Pledge, that is a pool of voluntary standard commitments for strengthening data privacy rights and digital commons values.

The Nexa Center was involved in the definition of the legal ontology adopted for Decode Smart Contracts and supported the legal compliance of the pilots. The Center was also involved in the dissemination activities of the project.

3.2 Payment Channel Networks for Blockchaing Scalability

A project that analyzes capabilities and limitations of payment channel networks, the most explored solutions which aim to solve the well-known issue of scalability of the blockchain

Project Website	https://nexa.polito.it/payment-channel-networks-blockchain-scalability
Status	ongoing
Period	November 2015 - November 2020
Funding	69,500 €
Funding organization	TIM S.p.A. (from 2019, Politecnico di Torino)
Persons in charge	Marco Conoscenti (Ph.D. Student, now Ph.D. Researcher)

The goal of the research project is to analyze capabilities and limitations of payment channel networks, the most explored solutions which aim to solve the well-known issue of scalability of the blockchain. Since June 2017, the research project is conducted by the Nexa Center in cooperation with Fulgur Lab.

Background

Bitcoin is a decentralized cryptocurrency that allows mistrusting peers to send and receive monetary value without the need for intermediaries. Bitcoin relies on the blockchain, a distributed peer-to-peer public ledger which stores all the history of Bitcoin economic transactions. The blockchain protocol, which is designed to contain centralization and to al-low any peer to actively participate in the system, limits the transaction throughput. For this reason, Bitcoin and other blockchain-based cryptocurrencies do not scale.

Payment channel networks are the most promising solution to address the issue of blockchain scalability, as they enable off-blockchain payments which are not subject to throughput limit of blockchain transactions. Payment channels are two-party bidirectional channels which allow the two channel parties to exchange an unbounded number of off-chain payments. Payment channels are linked together to generate a payment channel network, which allows also parties not directly connected by a payment channel to exchange off-chain payments.

The Lightning Network (LN) is the mainstream payment channel network, built for Bitcoin. At its current state of development, the LN presents critical features that, if not properly understood, implemented and controlled, might undermine the development of a healthy payment network. Some examples of these critical features are channel economic capacity, which limits payment amounts, channel unbalancing, which makes payment channels unusable in one direction, uncooperative behaviour of nodes, which may cause payment failures and lock of funds.

Objectives

The goal of this research project is to analyze capabilities and

limitations of payment channel networks. To accomplish with this goal, CLoTH was developed, a simulator for payment channel networks. CLoTH simulates the execution of payments on a payment channel network and produces performance measures such as probability of payment failures and average payment time. CLoTH is a valuable tool to identify issues, analyze solutions and steer future developments of payment channel networks.

So far, three groups of simulations were conducted using CLoTH: (i) simulations on the Lightning Network, aiming to discover configurations of the Lightning Network in which a payment is more likely to fail than to succeed; (ii) simulations on synthetic networks generated by the simulator, to analyze the impact of the simulator input parameters on payment network performance; (iii) simulations which studied network and protocol modifications on the Lightning Network (such as removal of the hubs from the network, and protocol optimizations which address the problem of channel unbalancing).

Results

The main achievements of this research project are:

(i) CLoTH, a simulator for payment channel networks written in C. As input, CLoTH takes parameters defining a payment channel network (e.g., number of channels per node, average channel capacity) and parameters defining payments (e.g., payment amounts and payment rate). It simulates the input-defined payments on the input-defined payment network. It produces performance measures in terms of payment-related statistics, such as probability of payment failure and time to complete payments. CLoTH can be used to identify issues of payment channel networks and to estimate the effects of protocol optimizations on the network before implementing them. It can also simulate attack scenarios and can study the evolution of payment channel networks.

(ii) Simulation results on payment channel networks. The main findings prove that the current most relevant issues of the Lightning Network are the limited channel capacities and channel unbalancing, which both cause payment failures. On the other side, simulations prove that the Lightning Network is resilient to the removal of the most connected network hubs and can support a contained level of faulty nodes. Another remarkable finding is that

a rebalancing approach designed in this research work proved to be effective against channel unbalancing.

(iii) A Ph.D., thesis entitled Capabilities and Limitations of Payment Channel Networks for Blockchain Scalability. The thesis presents the CLoTH simulator and the results of the simulations conducted so far.

(iv) A journal paper titled Hubs, Rebalancing and Service Providers in the Lightning Network, which discusses simulations conducted on hubs, service providers and rebalancing approaches in the Lightning Network.

(v) A journal paper titled The CLoTH Simulator for HTLC Payment Networks with Introductory Lightning Network Performance Results, presenting the CLoTH simulator and the first simulation results.

(vi) A literature review on the blockchain, which highlights the main research challenges of the blockchain (scalability and anonymity) and discusses possible applications of this technology. The literature review has been published as a paper titled Blockchain for the Internet of Things: a Systematic Literature Review.

3.3 The laws of Connected Drones controlled by the Network

The project focuses on the legal framework for Unmanned Aircraft Systems operations and the main issues raised by drone operations in urban contexts

Project Website	N/A
Status	ongoing
Period	September 2019 - 2Q 2020
Funding	40.000 €
Funding organization	TIM S.p.A.
Persons in charge	Eleonora Bassi (Senior Researcher), Giacomo Conti (Junior Researcher)

Background

The development of Unmanned Aircraft Systems ('UAS'), also known as Remote Piloted Aircraft Systems ('RPAS'), or simply drones, offers a wide range of possibilities for the benefit of society, from agriculture to security, from environmental control to journalism, from infrastructure inspections to medical assistance and humanitarian aid, as well as a fascinating variety of commercial services.

For the performance of UAS operations, as well as for data processing during the flight, the communication of geo-localization data, and the drone identification for flight control and security monitoring, UASs use mobile communication networks, including their cloud computing resources and services.

In the next years the integration of mobile networks is going to be stronger, and 5G technologies will play a crucial role. The legal framework for drone operations is evolving too, fostering the development of new safe and lawful activities.

Objectives

The project's objectives included:

(i) an analysis of the evolving European and Italian legal framework for UAS operations in urban scenarios, with attention to privacy constraints and measures.

(ii) an analysis of experimental use-cases from EU Member States.

(iii) academic publications.

Results

The activities and the results by Nexa Center were:

(i) a report on the revolution of UAS EU and Italian regulation, including standard scenarios for specific operation (author Giacomo Conti, Spring 2020);

(ii) a report on the most relevant European experimental use-cases of civilian UAS operations in urban contexts (author: Giacomo Conti, due date Summer 2020).

(iii) the following peer reviewed academic publications:

Eleonora Bassi, "European Drones Regulation: Today's Legal Challenges". In: 2019 International Conference on Unmanned Aircraft Systems (ICUAS). pp. 443-450. IEEE, Atlanta, GA (USA) (2019).

Eleonora Bassi, "From Here to 2023: Civil Drones Operations and the Setting of New Legal Rules for the European Single Sky". Journal of Intelligent & Robotic Systems, 2020, doi: https://doi.org/10.1007/s10846-020-01185-1.

Eleonora Bassi, "Urban Unmanned Aerial Systems Operations: on Privacy, Data Protection, and Surveillance", Law in Context (37) 2020, pp. 1-25, (accepted for publication, Open access.

4. Education

4.1 EDU-HACK – Hacking Education through eLearning and Open Education

A project that improves digital skills of teachers in Higher Education and works on a new approach for theirs's capacity building in the digital world

Project Website	https://eduhack.eu
Status	ongoing
Period	September 2017 - August 2020
Funding	437.990 € (126.710 € for Nexa)
Funding organization	European Commission (Erasmus+ Cooperation for Innovation and the Exchange of Good Practices / KA203 - Strategic Partnership)
Persons in charge	Juan Carlos De Martin (Coordinator), Mattia Plazio (Project Manager), Antonio Santangelo (Senior Researcher), Selina Fenoglietto (Administrative Manager), Giovanni Garifo (Technician)

Edu-Hack is an education project that intends to directly address the recommendation of the European Commission on Opening Up Education to "support teachers' professional development through open online courses" (2013) by increasing the digital skills of the higher education teachers in creating innovative learning and teaching approaches and tools.

Run by Politecnico di Torino (Italy), Universidad Internacional de La Rioja (Spain), Coventry University (UK), Knowledge Innovation Centre (Malta) and ATiT (Belgium), Edu-Hack develops a capacity-building methodology that uses online course (EduHack online course) and face to face intensive training activities (EduHackathons), whereby teaching professionals learn how to produce digitally-supported learning experiences and have the opportunity to experiment with creative models and approaches to teaching and learning, with a focus on fostering collaborative learning and student engagement.

Background

A number of recent policy initiatives have put a renewed emphasis on the creation and pedagogically-sound use of digital resources for education. In particular, the research accompanying the Opening Up Education Communication found that 50%-80% of students in EU countries never use digital textbooks, exercise software, broadcasts/podcasts, simulations or learning games, that most teachers do not consider themselves as 'digitally confident' or able to teach digital skills effectively, and that 70% of teachers would like more training in using ICTs.

Within Higher Education, the emergence of Open Educational Resources (OER), Massively Online Open Courses (MOOCs) and other blended methodologies (such as for example Flipped Classroom methods) is vastly increasing the demand for digital learning opportunities.

On the demand-side, the request for such opportunities is increased further by continued promotion of lifelong learning, leading students to ask for customizable and flexible study experiences, which can be taken along with other responsibilities such as work.

Hacking education with digital pedagogies

Objectives

The Edu-Hack project aims to tackle this problem at its source by:

(i) improving skills of higher education teachers in developing new learning and teaching approaches using open web and digital tools;

(ii) networking groups of educators in different countries, so as to share and combine work and improve cross-border collaborations;

(iii) matching teachers with other professionals (media-production experts, quality-assurance professionals, web developers etc.) to allow the creation of trans-disciplinary teams.

In particular, the Edu-Hack project:

(i) develops a methodology for a 1-2 days intensive course (prepared through an online collaborative learning phase), modelled after hackathons, whereby the higher education teachers work together to design and produce new learning content and teaching approaches;

(ii) organizes 3 instances of university teachers' hackathons around Europe;

(iii) sets up a European open resource database and network, which promote the reproduction of these events by other institutions and in other countries, either independently or with the help and expertise of the Consortium.

Results

The following results are expected upon completion of the project:

Curriculum for the eLearning course. The course-curriculum define contents, learning method and activities of the EduHack online course (distance learning part), providing to detail the framework on how users can participate and be involved.

EduHack online course (https://eduhack.eu/course/). The EduHack online course consists of a 6-8-week course, composed of 4 macro-area of activities and 19 learning modules. It covers the topics and activities defined in the curriculum and is based on a "connectivist" approach, where every learner is granted a web-space and builds knowledge in collaboration with other learners.

EduHack intensive training sessions (https://eduhack.eu/eduhack athons/). The EduHack online course runs in three successive rounds, each followed up by 1-2 day's intensive training session (EduHackathons), where participants work together to design and produce new learning content and teaching approaches and tools.

EduHack Community Hub (https://hub.eduhack.eu/). The EduHack Community Hub collects the contents produced by teachers during the EduHack online course and the EduHackathons, connecting the authors of the contents, the contents themselves and the topics of the course. It is a knowledge space where EduHackers can meet, read and comment on each other's posts, exchange ideas, experiences and innovative practices in education.

EduHack Toolbox (https://eduhack.eu/out-puts/o4/the-toolbox-con-tents-2/). The EduHack Toolbox carries the activities and results forward beyond the project life. It aims to set up a structure for independently organized an EduHack course and an EduHackathon. Under the EduHack Toolbox all outputs are openly licensed to allow for re-use and/or modification by third-party organizations.

At the end of May 2020, the first experimentation of the EduHack capacity-building programme has been successfully performed and finalized at the Universidad Internacional de La Rioja (Spain), at the Politecnico di Torino (Italy) and at the Coventry University (UK). At the same time, the EduHack Consortium has finalized the EduHack Toolbox and built the EduHack Network (https://eduhack.eu/net-work/), a network of institutions interested in using EduHack materials and services now and/or in the future.

4.2 Geranium

Empowering Open Access of Polito publications using Semantics and Deep Learning

Project Website	https://geranium.polito.it/
Status	ongoing
Period	January 2019 - present
Funding	in-kind
Funding organization	N/A
Persons in charge	Antonio Santangelo (Senior Researcher), Giuseppe Futia (Ph.D. Student), Giovanni Garifo (Researcher)

Geranium is a research project carried out by the Nexa Center for Internet & Society with the Research Area of Politecnico di Torino (PoliTO), aiming at developing a platform to: (i) reduce the barriers for accessing scientific publications by citizens; (ii) create new collaboration opportunities between researchers. The first achievements of the project are a (i) novel academic Knowledge Graph (KG) and (ii) a search engine to explore the publications of PoliTO researchers. An alpha version of the Geranium plat-form is available at: https://ge-ranium.polito.it/. All details related to the platform are available in the Master thesis of Giovanni Garifo (IT Manager and Research Fellow of the Nexa Center): https://webthesis.bib-lio.polito.it/13163/). The research project is supervised by Giuseppe Futia (PhD Student of the Nexa Center).

Background

PoliTO publications are currently available through the Institutional Research Information System (IRIS - https://iris.polito.it/) platform developed by the Cineca, a not-for-profit Consortium made up of 67 Italian universities, 9 Italian Research Institutions, 1 Polyclinic and the Italian Ministry of Education. The IRIS platform allows to explore publications of research institutions such as PoliTO, combining a search mask based on keywords with different filters. Nevertheless, the platform lacks a semantic infrastructure to contextualize and connect information related to different publications and authors. Moreover, the IRIS platform does not provide any

mechanism to facilitate collaborations between the authors and departments, which share common research interests.

Objectives

The goal of this research project is to design and develop a semantic platform for the PoliTO publications available on IRIS. The current work is focused on the improvement of the Web application to explore contents related to the papers and the researchers, introducing advanced filtering mechanisms. Moreover, we intend to increase the accuracy of the implemented recommendation system, whose goal is to suggest valuable connections between researchers.

Results

We developed the alpha version of the Geranium platform (https://geranium.polito.it/search) built on top of a novel academic KG, which semantically connects the information related to the publications available on IRIS. Geranium allows to explore details on authors and publications, through automatically extracted topics from the article abstracts. The topic extraction is performed by TellMeFirst (http://tellmefirst.polito.it), a tool developed by the Nexa Center, that employs Wikipedia and semantic technologies for text classification tasks. Moreover, Geranium currently provides a recommendation mechanism, implemented using Graph Neural Networks, which suggest authors with common research interests. The development team of this project is composed by: (i) Giuseppe Futia (PhD student and project lead), (ii) Giovanni Garifo (IT manager and lead software developer), Mehdi Khrichfa (Former Rivoluzione Digitale student and back-end developer), Cosma Alex Vergari (Former Rivoluzione Digitale student and front-end developer).

5. Institutional Networks

5.1 Global Network of Internet & Society Research Centers

A collaborative initiative among academic institutions with a focus on interdisciplinary research and a strong attention to the social impact and policy implications of their research agenda

|	
Project Website	http://networkofcenters.net/
Status	ongoing
Period	October 2014 - present
Funding	80.000 € (until 2016)
Funding organization	Compagnia di San Paolo (in-kind from 2017)
Persons in charge	Juan Carlos De Martin (Coordinator), Antonio Santangelo (Senior Researcher)

The Global Network of Internet & Society Research Centers (NoC) is a collaborative initiative among academic institutions (https://net-workofcenters.net/centers) with a focus on interdisciplinary research and strong attention to the social impact and policy implications of their research agenda.

Since late 2012, the Nexa Center is amongst its eight founding members and, between 2013 and 2014, has been involved in several NoC activities, as member of the Steering Committee. In particular, the roadmap and guiding principles for the NoC were discussed, with the aim to set up common practices for knowledge exchange amongst the NoC members (such as learning calls, workshops and conference), and joint research threads, focusing on interdisciplinary topics such as the role of online intermediaries, and Internet governance.

In October 2014 (until October 2016), the Nexa Center took the role of administrative coordinator of the Network, playing the role of contact point and facilitator. In particular, building on previous work and achievements, the main objective of the

Nexa coordination strategy 2014-2016 is to contribute making the NoC the most relevant Internet & Society research community worldwide both as a group of institutions and as a network of individuals.

Several initiatives were foreseen in this respect. Some of them relate to internal management (including the online presence of the NoC), others with the facilitation of research projects, such as the ones on Internet Governance models and on the role of Online Intermediaries (see https://www.net-workofcenters.net/research), as well as other special initiatives, such as the public consultation on the Italian Declaration of Internet Rights.
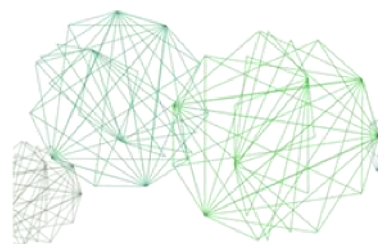
Between 2015 and 2017, the Nexa Center worked on the development and implementation of a semantic connected platform (https://noc-wiki.nexacen-ter.org), an umbrella tool that collects and connect

knowledge, project, people, resources from the world of Noc.

From 2018 onwards, including the reporting period, the Nexa Center, in addition to actively participating in the informal (hangout calls) and formal meetings of the NoC, continued to collaborate with its community. The collaboration took the form of two main initiatives: the presentation (Elena Beretta) of the research paper "Ethical and Socially-Aware Data Labels (https://nexa.polito.it/nexacen-terfiles/Beretta_Data_Eth-ics.pdf) within the Conference "AI: Legal & Ethical Implications" held in the Center for Cyber Law & Policy, University of Haifa (https://cyber.haifa.ac.il/); the collaboration to the first design of an Erasmus+ Jean Monnet - Networks initiative ("Growing European Societies in the Digital Age: Sustainability, Social and Legal Issues"), together with the Internet Interdisciplinary Institute (Barcelona), the Alexander von Humboldt Institute for Internet and Society (Berlin), the Center for Internet and Society (Paris), the Haifa Center for Law & Technology (Haifa) and the New Research on Digital Societies (Warsaw).

5.2 Global Network Initiative

A non-governmental organization with the dual goals of preventing Internet censorship by authoritarian governments and protecting privacy rights of individual

Project Website	https://globalnetworkinitiative.org/
Status	ongoing
Period	March 2013 - present
Funding	in-kind
Funding organization	N/A
Persons in charge	contributions from Staff and Fellows

GNI champions fundamental human rights online, with a focus on privacy and freedom of expression. GNI includes civil society and academic participants, but also investors and several major ICT companies (such as Google, Microsoft, Yahoo! or Facebook), with the aim of providing them with a standard framework to deal with fundamental rights online, ensuring accountability and enabling opportunities for policy engagement and shared learning across stakeholders. In March 2013, the Nexa Center for Internet & Society joined the Global Network Initiative as the first Italian participant. Nexa was welcomed in GNI as "a critical source of interdisciplinary research, informed by expertise in technology, law, and economics, on Internet policy from a European perspective." From 2013 onwards (including the reporting period), the Nexa Center participated in periodic calls, online exchanges, and informal initiatives of the Network.

5.3 Scienza Nuova – Italian Institute for Advanced Studies in Torino "Umberto Eco"

Scienza Nuova, the Italian Institute for Advanced Studies in Torino "Umberto Eco", is the newly established research institute born from the cooperation between the University of Torino and the Politecnico di Torino (the memorandum of understanding signed by the two Rectors on 9 January 2019)

Project Website	https://labont.it/areas/scienza.nuova/
Status	ongoing
Period	September 2019 - present
Funding	in-kind
Funding organization	N/A
Persons in charge	Juan Carlos De Martin, Antonio Vetrò, Antonio Santangelo

Scienza Nuova has been officially inaugurated in September 2019 and aims to comprehend the ongoing social transformations due to the Digital Revolution, and to train a selected number of scholars and operators able to manage these changes thanks to the connection of technological and humanistic knowledge.

Its project is based on the theoretical content presented in the books "Università futura. Tra democrazia e bit" (Codice Edizioni 2007) and "Scienza Nuova. Ontologia della trasformazione digitale" (Rosenberg & Sellier 2018).

Its working group is made up by the Labont – Center for Ontology (https://labont.it) and by the Nexa Center for Internet & Society (https://nexa.polito.it/).

Its physical headquarters will be the Casa degli Spiriti in Corso Montevecchio n. 38, Turin. The temporary headquarters is the Department of Philosophy and Educational Science.

5.4 CINI – Laboratory for Informatics and Society

Laboratory of the Italian National Inter-University Consortium for Informatics. It fosters research collaborations between Italian Universities for supporting policy making in understanding and governing the digital revolution.

Project Website	https://www.consorzio-cini.it/index.php/it/laboratori-nazionali/lab-informatica-e-societa
Status	ongoing
Period	April 2016 - present
Funding	N/A
Funding organization	N/A
Persons in charge	Juan Carlos De Martin (Director, until December 2019) Antonio Santangelo (Senior Researcher), Antonio Vetrò (Senior Researcher), Mattia Plazio (Management)

The CINI - Italian National Inter-University Consortium for Informatics (https://www.consorzio-cini.it/index.php/en/) includes 10 national laboratories and 44 public Italian Universities, involving 1.300+ teachers in the scientific disciplinary sectors of Informatics and Computer Engineering. It promotes and coordinates scientific activities - research and technology transfer - in the field of computer science, in concert with the national scientific communities of reference.

The CINI - Laboratory for Informatics and Society (LabIS), founded and directed by Prof. Juan Carlos De Martin (until December 2019), includes 16 Nodes distributed throughout the national territory and corresponding to as many Universities consortiumed in the CINI (https://www.consorzio-cini.it/index.php/it/home-informatica-e-societa/organizzazione-e-nodi); each Node is directed by a coordinator and includes teachers and researchers. The LabIS aims at contributing to the national efforts in understanding and governing the digital revolution across several strategic sectors, from the economy to public administration, from geopolitics to education. The research topics addressed in the Laboratory of Informatics and Society concern the following macro areas:

digital divide (infrastructural, cultural and economic), digital economy and competition, digital policy-making, automation and work, digital and education, privacy and human rights, ethical, legal, social and epistemological aspects of big data, net and platform neutrality.

Between 2016 and 2017, the Nexa Center supported the birth of the laboratory, its network and first activities, guiding the affiliation path to the LabIS of each node, creating, managing and animating its official mailing list, building a wiki-platform (https://infsocieta-wiki.nexacenter.org/) that collects and connect knowledge, project, people, resources from the world of LabIS. The effort has been culminated in the organisation of the 1st annual event of the CINI - Laboratory for Informatics and Society held in Torino on December 18th, 2017 as part of the 9° Nexa Conference entitled "Ethics and Governance of Artificial Intelligence (http://nexa.polito.it/conf2017).

In addition, the LabIS collaborated with the Nexa Center to the organisation of the panel "Internet, Industry and Society" within the IEEE COMPSAC 2017 Conference held in Turin from 4 to 8 July 2017. A panel which was attended by one of the world's leading scholars on digital issues, Prof. Yochai Benkler of Harvard University.

Between 2018 and 2019, the Nexa Center contributed (Antonio Santangelo) to draft to the Ethic Code of CINI - Italian National Inter-University Consortium for Informatics and participated (Giuseppe Futia) to Ital-IA (http://www.ital-ia.it/), the first CINI National Conference on Artificial Intelligence held in Rome in March 2019 and organized by the CINI Laboratory on Artificial Intelligence and Intelligent Systems (AIIS) to develop and share common objectives between Italian public institutions, industry and universities.

From January 2020 the CINI - Laboratory for Informatics and Society has a new director: Prof. Viola Schiaffonati, Professor of Logic and Philosophy of Science at the Dipartimento di Elettronica, Informazione e Bioingegneria of Politecnico di Milano. The Nexa Center remains one of the active Nodes of the network.

6. Teaching Activities

6.1 "Digital Revolution": an Undergraduate Course at Politecnico di Torino

A Politecnico di Torino undergraduate course, trying to understand the times we are living

Project Website	http://rivoluzionedigitale.polito.it/
Status	ongoing
Period	2012 – present
Funding	Standard funding by Politecnico di Torino (additional support in-kind)
Funding organization	Politecnico di Torino + Nexa internal funding
Persons in charge	Juan Carlos De Martin (coordinator and lecturer), Giuseppe Futia (teaching assistant).

Background

"Rivoluzione Digitale" (Digital Revolution) is an elective course for first-year students at Politecnico di Torino, taught by Prof. Juan Carlos De Martin with the collaboration of Giuseppe Futia. The course aims to contribute to the education of future engineers and architects as digital individuals, by providing students with the multidisciplinary knowledge required to understand the digital revolution, and by teaching them practical online-world skills.

Objectives

Ranging from business activities to culture, from politics to everyday life, digital-revolution effects are so deep and

lasting that the traditional education of engineers and architects has to be complemented with selected multidisciplinary knowledge – legal, economic, historical and social to fully understand the aspects of the digital revolution and the related impact on society. Moreover, on the practical side, responsible and aware digital citizens need to master online skills such as blogging, discussing on mailing lists and on twitter, producing short videos of themselves presenting their own work and ideas.

Results

Due to the Coronavirus emergency, the teaching activities of the current academic year have been conducted online. We exploited different platforms, including the Virtual Classroom offered by the Politecnico di Torino and YouTube. For student's coordination, we introduced in the course new collaboration tools, such as Slack. The course featured some guest lecturers among the Nexa Fellows (Carlo Blengino, Lorenzo Canova, and Alessio Melandri) and the Nexa Research Fellows (Marco Conoscenti, Antonio Sant'Angelo). In 2020 we enrolled 157 students (155 in 2019).

6.2 "Digital technologies and society": a Master Course at Politecnico di Torino

A Politecnico di Torino master course (Master of Science in Computer Engineering) aiming at raising awareness on what being a computer engineer means in the age of the digital revolution

Project Website	https://tds.polito.it/
Status	ongoing
Period	March – June (2019, 2020)
Funding	Standard funding by Politecnico di Torino (additional support in-kind)
Funding organization	Politecnico di Torino + Nexa internal funding
Persons in charge	Juan Carlos De Martin (coordinator and lecturer), Paolo Prinetto (lecturer), Antonio Vetrò (lecturer)

Background

In the age in which technological developments such as the Internet of Things, Artificial Intelligence, Big Data, social networks and smartphones are revolutionizing economy, politics, culture, and personal relationships, the course aims at introducing the student to the reflection on the social impact of information technology and, vice versa, on social conditioning on the development of information technology.

Objectives

The goal of the course is to lead students to understand their role in society both as a professional and as citizens with certain technical and scientific skills. The course is highly inter-disciplinary, even though it constantly refers to specific knowledge on information technologies. The hours lectures are 60.

Results

The first edition of the course took place in the Academic Year 2018/2019. Lectures were done from March 2019 until mid-June 2019. The students who enrolled in the course are 55. Examples of topics covered are professions and code of ethics; history of computers and Internet; interpretative models of technology; ethical and policy issues in information systems; data bias; algorithm fairness. The evaluation has been based on a horal exam and on a report composed of two parts: an in-depth study on a topic of choice, and a data impact assessment (on a R or Jupyter notebook) on a dataset provided by teachers where students apply the techniques learnt for assessing data bias; algorithm fairness.

The second edition of the course, from March 2020 to mid-June 2020, counts 40 students enrolled and it is done entirely via remote classes due to the Covid-19 global emergency. During the course, students will be asked to give a presentation on a real case of algorithmic discrimination and discuss it with the rest of the classes. Eventually, due to the new conditions of the global health emergency, the evaluation will be different from the one conducted in the first edition, and it will be defined only at the end of the course.

6.3 "Data Ethics and Protection": a Master Course at Politecnico di Torino

A Politecnico di Torino master course (Master of Science in Data Science snd Engineering) aiming at giving students an increased awareness of the role of data scientists and data experts in society, and a better understanding of the main challenges that they face in developing innovative data-driven products and services.

Project Website	https://didattica.polito.it/pls/portal30/gap.pkg_guide.view-Gap?p_cod_ins=01TXHSM&p_a_acc=2020&p_header=S&p_lang=IT
Status	ongoing
Period	March – June (2020)
Funding	Standard funding by Politecnico di Torino (additional support in-kind)
Funding organization	Politecnico di Torino + Nexa internal funding
Persons in charge	Alessandro Mantelero (coordinator and lecturer), Juan Carlos De Martin (lecturer), Antonio Vetrò (lecturer),

Background

This course is mainly designed to give students an increased awareness of the role of data scientists and data experts in society, and a better understanding of the main challenges that they face in developing innovative data-driven products and services.

Adopting an interdisciplinary approach, the course focuses both on ethical and legal issues, seen through the lens of technology. The hours of lectures are 60.

Objectives

From this perspective, the first part of the course will provide a general overview of the interplay between law, ethics and technology, discussing the most relevant issues in the ongoing debate on law & ethics with regard to data-intensive systems. In this context, data protection regulations and their

application in the AI environment will be addressed, including risk assessment methodologies.

The course then will go beyond the traditional sphere of data protection and deal with the impact of data use on fundamental rights and ethical values, considering different proposals and guidelines on data ethics.

The second part of the course is focused on the computer science perspective, with the following approach. Students will first analyze and interactively discuss in class the ACM Code of Ethics and Professional and selected case studies: the goal is to acquire a greater awareness of the duties of a professional to understand the consequences for people and society of apparently only technical choices.

Then, students will learn methodologies and data analytics tools to design and conduct an impact assessment for data-driven automated decision systems.

Results

At the time of writing this report, the first edition of the course is taking place in the Academic Year 2019/2020: lectures are from March 2020 until mid-June 2030. The students who enrolled in the course are 164 and, due to the Covid-19 global emergency, they attend classes remotely

6.4 New Media Languages
An undergraduate course at the online University eCampus

Project Website	https://servizi.uniecampus.it/portale/ero-gaschedacorso.aspx?fn=SCCO032&aa=2017
Status	ongoing
Period	2015-present
Funding	Standard funding of eCampus University
Funding organization	eCampus University
Persons in charge	Antonio Santangelo (lecturer)

"New media languages" is a mandatory course for the second year students of Communication Sciences at the University eCampus. It is an online course which aims at illustrating how intermedia and transmedia communication strategies can be used, to turn "old media" like television, cinema, books, newspapers, videogames, etc., into "new media", which can offer their users new and meaningful communicative experiences. Many examples are taken from political communication, so that students can learn how to use "new media" to involve people into communication projects that may help them better participate to the democratic life.

Background

Antonio Santangelo has always worked in the field of media studies. One of his main research topics is technological innovation and its cultural meaning. He has also worked as a TV author and as a spin doctor for political campaigns, to involve people into communication projects with the aim of empowering them with tools that may facilitate cooperation and knowledge sharing. He has studied these projects from a linguistic point of view. His theory is that a certain usage of media language can move people to act in a clever way.

Objectives

The course aims at giving students two kinds of capacities: some critical and some practical ones. The critical capacities are needed to distinguish clever intermedia and transmedia projects, the ones that can better raise the collective creation of knowledge and that can help people to share an intelligent and rich vision of the world. The practical capacities are needed to help students to become media designers, so that they can project new interesting media experiences.

Results

The course is attended from 350 students per year and is very appreciated, with a very high rank (5 points out of 5) in terms of the content's quality and interest. Many students do their final thesis on the topics of New Media Languages.

Nexa Center
for Internet & Society

6.5 "Evolutionary dynamics of science and technology": a course within the Specialization Master's in journalism at Università di Torino

The goal of the course is aligned with that of the Master: to equip students with the professional, technical and cultural tools to work competently in new scenarios and recognize the new challenges of journalism.

Project Website	https://www.mastergiornalismotorino.it
Status	concluded
Period	February – March (2020)
Funding	Standard funding by Università di Torino
Funding organization	Università di Torino + Nexa Center internal funding
Persons in charge	Antonio Vetrò (coordinator and lecturer), Juan Carlos De Martin (lecturer)

Background

The Master's in journalism 'Giorgio Bocca' of Turin was born in 2004 on the initiative of the Order of Journalists (national and regional) and the University and was named after Giorgio Bocca in 2013. Open to students from all over Italy, it is a reference point for a vast geographical area that includes Piedmont, Liguria and Valle d'Aosta. It has been consolidated in the context of training in journalism recognized by the National Association of Journalists: there are currently 11 schools recognized in Italy, but it is the only one in the North-west.

The Master's degree replaces the two-year period of internship required by law to take the State exam and obtain the professional title and is in direct contact with the reality of information and publishing through internship and collaboration agreements; it counts in particular on collaboration with relevant Italian newspapers: La Stampa, Il Secolo XIX and La Repubblica.

Objectives

Within this context, the course "Evolutionary dynamics of science and technology" has two main objectives:

(i) Let students acquire awareness of the relationship between society and technological developments, and digital technologies.

(ii) Let students understand fundamental lessons from the history of communication technologies, useful for interpreting and addressing the opportunities, risks, and future trends of the digital revolution.

The topics covered are the following:

(i) The concept of Digital Revolution, the relationship between technology and society and the interpretative models of Benkler and Winston.

(ii) Knowledge before the digital technologies: definitions and methods of production, diffusion, consumption, preservation, reuse

(iii) The roots of the computer: the universal computer, from Leibniz to Turing

(iv) The legacy of Turing, the intelligent machines: definitions, conceptual foundations, ethical issues

(v) Electronic calculators: short history and determining factors in their evolution

(v) From the second world war to the end of the 60s, the culture that shaped the first developments of digital technologies: a) Cybernetics, its legacy, and the interconnections with the Data Revolution; b) Stewart Brand's projects and their contribution to the digital revolution

(vi) The history of the Internet and the World Wide Web, and the Declaration of Rights on the Internet.

MASTER GIORNALISMO TORINO

Results

The first edition of the course took place in the Academic Year 2019/2020: lectures were don in February and March 2020, for a total of 16 hours (including the final exam). The students who enrolled in the course were 14 and, due to the Covid-19 global emergency, they attend classes remotely.

Students have been assessed on their ability to critically reflect on the development of digital techniques: the exam consisted of selecting and reading an article from a pool proposed by the lecturer and produce a short journal article with reflections on the topic.

6.6 Nexa Summer School

A summer school for Ph.D. and MS students on AI, trying to see it in a positive way, without underestimating the dangers it may take to our democratic life

Project Website	https://nexa.polito.it/nexa-summer-school-2019
Status	concluded
Period	June 2019 – July 2019
Funding	Politecnico di Torino + Nexa internal funding
Funding organization	Politecnico di Torino
Persons in charge	Juan Carlos De Martin (supervisor), Antonio Santangelo (coordinator), Selina Fenoglietto, Mattia Plazio, Francesco Ruggiero (organization)

Background

In occasion of the Nexa Center's 2019 Board of Trustees, a summer school for Ph.D and MS students on Artificial Intelligence has been organized to focus on AI from the point of view of a "critical utopia", that is of an anthropocentric technology, aware of the dangers it may take if developed in the wrong direction. This perspective can only be interdisciplinary, and it has been built keeping together engineers, philosophers, social scientists, economists, and jurists.

The summer school was the natural development of a course for Ph.D students called "Topics in Internet & Society Interdisciplinary Studies", which had been given three other times, in the past, at Politecnico di Torino, in conjunction with the Nexa Center for Internet & Society's Board of Trustees.

Objectives

The summer school aimed at strengthening the relationship between Politecnico di Torino and some prestigious foreign Universities, such as Harvard and Villanova (USA), Max Planck Institute (Germany), Université de Montréal (Canada), Bournemouth University (UK), Telecom ParisTech (France).

This goal had been pursued inviting some members of the Board of Trustees of the Nexa Center for Internet & Society (DAUIN) of the Politecnico di Torino - prestigious and very well-known scholars coming from the Universities mentioned above - to give lectures, together with the personnel of the Nexa Center and with some of its Italian fellows, on Artificial Intelligence and its consequences on society, law and sustainability.

Another aim of this project was to give more visibility to the Nexa Center's teaching activities, by promoting them within the more than 90 members of the Global Network of Internet & Society Research Centers (Noc), which has been coordinated in the past by the Nexa Center itself and counts many very prestigious affiliate Universities from all over the world.

Results

The summer school lasted 5 days and it involved 16 participants, of which 9 students (2 from foreign universities) and 7 not students but very interested in the topics covered. The participants were engaged in 18,5 hours of lectures and 19 of other cultural, recreational and sports activities. The summer school was highly appreciated, for its interdisciplinary cut, which satisfied the multiple interests of the participants, and for the quality of the lectures and teachers, many of whom are internationally renowned.

The Nexa Trustees and Nexa Fellows that have been involved in the lectures are: Jean-Claude Guédon (University of Montreal), Charles Nesson (Harvard University), Fern Leicher Nesson (photographer), Maurizio Borghi (Bournemouth University), Brett Frischmann (Villanova University), Antonio Casilli (Telecom Paris Tech), Monica Senor (The Italian Data Protection Authority), Bruce Sterling (author and journalist), and Jasmina Tešanović (activist and writer). For the details of the program, of the activities and of the lectures visit https://nexa.polito.it/nexa-summer-school-2019 .

6.7 "Software Engineering II": a Master Course at Politecnico di Torino

A Politecnico di Torino master course (Master of Science in Computer Engineering) aiming at expanding the knowledge and skills of students in the software engineering, especially concerning the management of the software development process, the organization of development activities, quality assurance, process improvement and software evolution

Project Website	https://softeng.polito.it/courses/SE2/
Status	ongoing
Period	October 2019 – January 2020
Funding	Standard funding by Politecnico di Torino (plus support in-kind)
Funding organization	Politecnico di Torino Nexa internal funding
Persons in charge	Marco Torchiano (coordinator and lecturer, Nexa Faculty Fellow), Antonio Vetrò (lecturer)

Background

The knowledge that students acquired through the fundamental and optional courses mainly concern technologies that can be used to build software systems (e.g. programming languages, web technologies, security, computer architectures) and basic techniques and tools to support development (e.g. deployment, version control, requirements, design). In order to effectively employ such knowledge and skills, it is fundamental to organize the development activities and manage them, curate the quality of the software products, and account for the inevitable characteristic of software: its persistent change.

Objectives

The students will acquire basic knowledge regarding:

i) software development methods, focusing on agile methods

ii) software quality assurance and process improvement, in particular static analysis and technical debt assessment,

iii) software evolution dynamics.

A key component of software development (as it happens in industrial context) is teamwork. Key skills to be developed include:

i) coordination of individuals and their interactions,

ii) planning and monitoring the project evolution,

iii) manage stakeholders' collaboration,

iv) set up self-organizing teams.

Results

The first edition of the course took place in the Academic Year 2019/2020: the students who enrolled in the course were 70. The course has been organized with a balance of theory (20% of the evaluation) and practice (80% of the evaluation): conventional lectures introduced the theory concerning the main topics of the course. Such lectures had been followed by practical sessions (either collective exercises or hands-on development sessions). A key component of software development that has been exercised is teamwork, including coordination of individuals and their interactions, leveraging stakeholders' collaboration, and achieving self-organization. The course obtained high satisfaction among students.
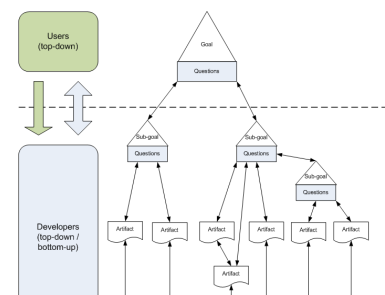
6.8 Other teaching activities

The other teaching activities of the Nexa Community linked to the life of the Center

Riconnessioni - Fondazione per la Scuola (Compagnia di San Paolo)

Riconnessioni is an education project (www.riconnessioni.it/) whose goal is to support teachers in bringing technological, organizational and didactic innovations in primary and junior high schools. The mission of the project is to create a model of educational innovation at a national level. The Nexa Center participates to the project by organizing and teaching to the laboratory "Essere digitali" ("Be Digital"), in which teachers are provided with an overview of the historical roots of the current digital revolution and of the latest technological developments. In the reporting period, Juan Carlos De Martin, Antonio Santangelo and Antonio Vetrò gave lectures. The program and the material are available at www.riconnessioni.it/notizie/laboratori/essere-digitali/).

Digital Revolution for librarians

In October 2019, Juan Carlos De Martin, Antonio Santangelo and Antonio Vetrò gave a three-day course on the Digital Revolution to a selection of about 30 librarians from public libraries of Torino. The content of the lectures is the same of "Essere digitali" ("Be Digital", see project "Riconnessioni"): at the end of the course, librarians are expected to have acquired the basic knowledge and the conceptual tools to understand the digital revolution.

Big Dive

The Top-IX consortium and other partners organize Big Dive, a five-week training program providing the key technical skills needed to dive into the big data universe, including some multidisciplinary knowledge useful to extract value from data. In July 2019, within its 8th edition, Antonio Vetrò gave a lecture on "Formalizing (and achieving?) fairness in machine learning". More info at https://www.bigdive.eu/big-dive-8/ .

7. Funding, Organization, Relationships & Community

7.1 Budget summary

Table 1 below summarizes the total costs sustained by the Nexa Center in fiscal year 2019.

Research personnel		**€ 265.800,00**
Nexa Center staff	136,100 €	
Tenured personnel	83,200 €	
Research Ph.D.	46,500 €	
Other personnel		**78,200 €**
Other costs		**91,800 €**
Events organization and communication	31,900 €	
Travel (Nexa)	9,200 €	
Travel (guests/speakers)	700 €	
Equipment	5,700 €	
Functioning costs (heating, phone, cleaning, etc.)	2,600 €	
Outlays for the use of the Center venue	20,000 €	
Surplus from projects to PoliTo personnel	8,400 €	
Indirect costs (contribution to the Polytechnic University of Turin budget, deducted from Nexa projects)	13,300 €	
Total costs		**435,800 €**

Table 1 Nexa Center: costs sustained in 2019

"Research Ph.D." (see Table 1) includes Ph.D. students: Giuseppe Futia (the scholarship financed by the Italian Ministry of Public Education) and Elena Beretta (the scholarship financed by Fondazione Bruno Kessler (FBK).

"Other personnel" (see Table 1) includes administrative personnel (Selina Fenoglietto), personnel dealing with events and communication (Francesco Ruggiero until 30th September 2019, and Anita Botta from 16th October 2019), technical personnel (Giovanni Garifo) and an estimate of the cost of other managerial activities, which are not directly related to research (e.g., 30% of the cost of Antonio Vetrò and of Antonio Santangelo). Some cost entries (e.g., tenured personnel) include in kind contributions (see also Table 2 below).

The contribution of the Nexa Center to the budget of Polytechnic University of Turin is calculated as the share of the external funding deducted by the central administration or the Department of Control and Computer Engineering (DAUIN), mainly to cover indirect costs. This amount is going to increase: it was 13,300 € in 2019 and it will be at least 41,900 € in 2020.

Project / other source of funding	2019	2020	2021
EDU- HACK	35,600 €	23,300 €	
DECODE	26,600 €	14,500 €	9,900 €
VIRT-EU	1,200 €		4,000 €
Past projects leftover	300 €	3,200 €	13,300 €
Grant from Telecom Italia ("trade-off" privacy)	2,600 €		
Grant from TIM S.p.A. (Connected Drones)	30,400 €	27,400 €	4,700 €
Grant from TIM S.p.A. (AI)	26,400 €	26,900 €	3,700 €
Grant from AGID (White paper on Artificial Intelligence)	10,450 €	35,000 €	9,800 €
Big Data Academy project -Intesa Sanpaolo	4,000 €		
Riconnessioni project - Fondazione per la Scuola della Compagnia di San Paolo	14,300 €	21,100 €	
Digital library education project - Fondazione Esperienze di Cultura Metropolitana		2,500 €	
Gift from eBay (Internet of Things)	4,200 €		
Gift from Foundation P&R	5,800 €	23,700 €	4,400 €
Gift from Urs Gasser		1,000 €	
Gift from Comitato ICT	4,300 €	25,100 €	
Research Ph.D.	46,500 €	20,200 €	
Research funding by Polytechnic University of Turin	15,400 €	15,100 €	9,800 €
Contribution in kind from Polytechnic University of Turin (mainly personnel effort)	177,750 €	105,900 €	105,900 €
Contribution in kind from Prof. Marco Ricolfi	30,000 €	30,000 €	30,000 €
Total	**435,800 €**	**374,900 €**	**195,500 €**

Table 2 Nexa Center: expected funding in 2019, 2020 and 2021 (as of April 2020)

Table 2 provides an overview of the sources of funding in 2019 and an estimation of the expected funding in 2020 and 2021, which are based on relatively conservative assumptions. In fact, only funding related to the ongoing relationships and agreements (even without strict legal obligation to provide this funding, e.g. because it is subject to the discretionary evaluations of some funding institutions) is reported. No funding is listed in case of simple submitted and unapproved project proposals. It is also worth mentioning that some of the funding threads are likely to be available and used by the Center also beyond 2019. In those cases, the figures reported do not capture the entire amount of the funding.
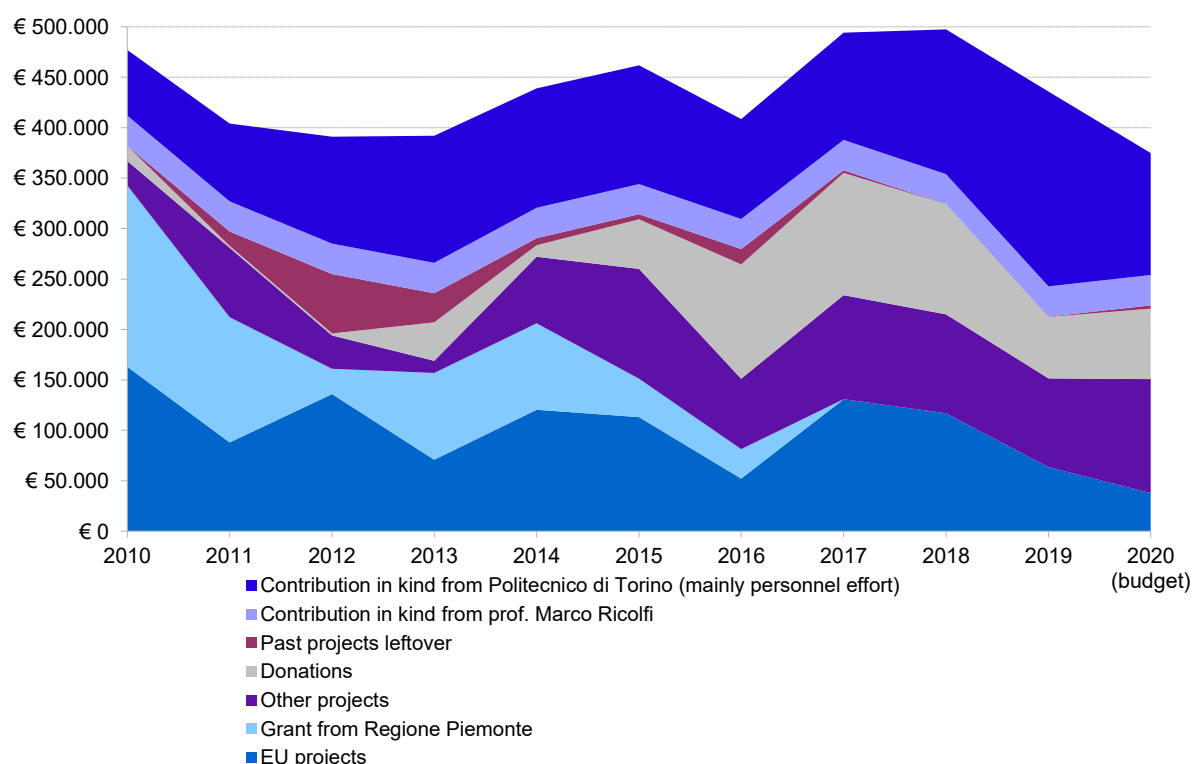
Figure 1 Composition of available financial resources (in Euros), 2010-2020

Figure 1 reports the composition of the available financial resources from 2010 to 2020 (forecasts only for 2020). It can be noticed that funding from Regione Piemonte dried up in 2017 but is counter-balanced by donations and by contribution in kind from Polytechnic University of Turin.

7.2 Accountability and transparency

The 'Accountability and transparency principles' of the Nexa Center are here reported, as finalized in December 10th, 2013, in light of the debate involving Nexa directors and trustees, and reported in the following page https://nexa.polito.it/transparency-and-accountability). The Nexa Center for Internet & Society is an independent research center. While the reputation of the center ultimately rests on the quality, consistency and integrity of its actions over the course of time, the Nexa Center also adopts several ex ante rules to support the independence of the center both in substance as well as in external perception. In this regard, the issue of funding is particularly sensitive. As a general principle,

the Nexa Center does not accept funding that may limit the ability of the center to carry out independent and unbiased research. The Center strives to ensure that its funding comes from a range of entities, including public sector bodies, foundations, the private sector and individuals, to minimize the dependency from any specific actor (or category of actors).

Since funding provided by for-profit entities is particularly sensitive, during each reporting period, including the one covered by this Report, the Nexa Center is committed to follow accountability and transparency guidelines concerning for-profit funding. Such guidelines are formalized as follows:

(i) The existence and the nature of all funding over € 1,000 will

be published on the website of the Nexa Center and regularly updated. Each year, the Nexa Center will also publish on its website the public version of its Annual Report, containing the same information.

(ii) In a given year, and as a matter of principle, funding coming from any single for-profit entity should not exceed 15% of the budget of the Center in that year. This threshold will be reexamined at each annual meeting of the Board of Trustees, according to the general principle that, if the Centerbudget increases, this threshold will be proportionally reduced.

(iii) The overall contribution coming from for-profit entities should in principle not exceed 1/3 of the overall budget of the Center in that year.

(iv) If the aforementioned thresholds are to be exceeded, the case will be brought to the attention of the Board of Trustees which will issue a binding recommendation to be included in the Annual Report.

(v) In any case, the relationship with for-profit funders will explicitly provide that the Nexa Center accepts to undertake a certain research activity based only on the scientific method and without being constrained by any previous indication or directive from the funder (e.g., in terms of expected deliverables and research products, apart from agreeing on the definition of the field of research and organizational details).

(vi) Consultancy and similar activities involving more specific directives from a third party, if undertaken, will be clearly labeled as such.

(vii) Any changes to these policies will be subject to the approval of the Board of Trustees.

Regarding the reporting period, the funding guidelines have been respected as far as all points 1.–5. Regarding point 2., funding from a single for-profit entity (coming from Telecom/TIM, Intesa Sanpaolo, eBay, Foundation P&R and Fondazione per la Scuola della Compagnia di San Paolo) remained below the 15% cap (implying a maximum funding of about 65,370 in 2019). The same goes for the criteria expressed at point 3. Given the estimations of the 2020 budget, all criteria will be respected also in the next reporting period.

Funding coming from for-profit entities	% of 2019 budget (absolute value)	% of 2020 budget (absolute value)
Telecom Italia	**0,60 %**	
Telecom Italia S.p.A., Piazza degli Affari n. 2, 20123 Milano	(2,600 €)	
TIM	**13,03 %**	**14,48 %**
TIM S.p.A. Via G. Negri 1, 20123 Milano	(56,800 €)	(54,300 €)
Intesa Sanpaolo	**0,92 %**	
Intesa Sanpaolo, Piazza San Carlo, 156 10121 Torino	(4,000 €)	
eBay	**0,96 %**	
eBay Sweden AB Stockholm C/O Recall Deutschland GmbH Landsbergerstrasse 140 Leipzig 04157 German	(4,200 €)	
Total from for-profit entities	**15,51 %**	**14,48 %**

Funding coming from no-profit entities	% of 2019 budget (absolute value)	% of 2020 budget (absolute value)
Foundation P&R	**1,33 %**	**6,32 %**
Foundation P&R, *Via dell'Annunciata 23/2 20121* Milano	(5.800 €)	(23,700 €)
Fondazione per la Scuola della Compagnia di San Paolo	**3,28%**	**5,63 %**
Corso Ferrucci, 3 10138 Torino	(14,300 €)	(21,100 €)
Total from for-profit entities	**4,61 %**	**11,95 %**

7.3 Project Proposals

7.3.1 CLIKC (EU Project)
Content and Language Integrated Learning for Key Competences

Project Website	N/A
Status	Under evaluation
Period	N/A (duration: 36 months)
Funding	432.627 € (70.200 € for Nexa)
Funding organization	European Commission (Erasmus+ KA202 - Strategic Partnerships for vocational education and training)
Persons in charge	Mattia Plazio, Selina Fenoglietto, Giovanni Garifo

Abstract

The labor market is changing structurally. Companies have stopped investing in the centralization of resources and are favoring the construction of differentiated networks that allow them to modulate operating loads by drawing on globally distributed skills and making use of the wider support of artificial intelligence systems. This phenomenon is called Task-based technical change (TBTC) and is having a profound impact on the employment structure, causing the disappearance of intermediate jobs in Western economies. The TBTC and the resulting erosion of internal labor demand replaced by digital automation technologies represent a significant threat to the employability of the workforce. Today, workers must be able to compete in a much larger market than before and, at the same time, they must be able to act in virtualized and digitized work environments. Moreover, the increasing flexibility of working relations is progressively transferring to individual workers the burden of taking full responsibility for the development of their skills, enhancing their horizontality, with emphasis on relational, linguistic, and digital skills. Looking at this context, CLIKC is a project that aims to: promote the training of employed and unemployed people on language, digital and soft skills, through the creation of an online training catalog made of online learning pills associated with learning objects developed through the Content Integrated Learning; innovate the training methodologies and tools available to VET providers, through the development of new tools and digitized training paths; develop new and more effective profiling methods by VET providers, favoring the alignment between perceived and actual skills needs, through the development and testing of an ICT tool, based on AI.

7.4 Organizational aspects

During the reporting period, two new people have joined the Nexa Staff:

Anita Botta: holds a master's degree in Communication and Media Cultures in 2019 at the University of Turin. From October 2019, she oversees communication and press office at the Nexa Center, keeping contact with media and following Nexa's image on social network.

Giacomo Conti: graduated in Law with a thesis on contractual liability for defective software. He works at the Nexa Center for Internet & Society supporting the researches on AI and Drones in Telecommunications (TIM projects). His research interests include laws studies concerning contemporary technologies. He is a member of the Order of Journalists of Piedmont since 2016.

A special mention is also due to the Executive Director of the Nexa Center, Antonio Santangelo, who in November 2019 officially became tenured Assistant Professor at the Philosophy Department of the University of Turin. Moreover, a special thanks for his work is due to Francesco Ruggiero, who left the Nexa Center in October 2019, after collaborated with it since 2016 as Communication Manager.

In addition, as every year, a significant number of interns, trainees, and young scholars collaborated with the Nexa Center, working to support the Nexa Staff in the current activities. In the academic year 2019/2020, the new interns, trainees and young scholars are been (or are): Irene Domenicale, who worked to the organization and management of the PoliTo training pilot path of the "Edu-Hack" project; Nicolas D'Amanzio and Viola Inui Biffi, who both

worked on the creation of new media contents for the "Nexa City" project; Cosma Alex Vergari, who are supporting the development of "Geranium" project as Frontend Developer; Flavio Emanuele Cannavò, who worked supporting the research on the ethical and privacy issues related to the use of Artificial Intelligence in the Telecommunication context (TIM project), developing also a thesis for its master's degree in Computer Engineering entitled "Fairness and Equality of Opportunity in the Algorithmic Era", under the supervision of Juan Carlos De Martin, Antonio Vetrò and Elena Beretta; Giuseppe Di Bartolomeo, who graduated in Computer Engineering (master's degree) with a thesis entitled "Blockchain scalability: simulations and analysis on the Lightning Network", under the supervision of Antonio Vetrò and Marco Conoscenti; Maria Chiara Mecati, a new Ph.D student who are working on the research project "Data Bias: Identification of Mitigation and Remediation Strategies, Techniques and Tools", in collaboration with the Softeng research group, that guides the research, and under the supervision of Antonio Vetrò and Marco Torchiano (Fellow Nexa).

2° Nexa Fellows Weekend: towards a "Nexian narrative"

In the academic year 2019/2020, after the success of its first edition, the Nexa Center also organized the 2° Nexa Fellow Weekend. On 21-22 September 2019 at the Certosa 1515 in Avigliana (TO), the whole community of Nexa Fellows and Staff met to begin to work on a new ambitious project: the multi-hand drafting of a book that narrates the point of view of the Nexa community on the digital revolution underway. The

two days were the opportunity to discuss together, and with a strong interdisciplinary perspective, around some of the main topics of pressing relevance linked to the relationship between technology and society, technology and politics, technology and economy, etc., all possible chapters of a book that should tell to the world what the Nexa Center thinks about the digital revolution and its consequences.

The 2° Nexa Fellow Weekend ended with the unanimous decision to organize a series of internal meetings and seminars to discuss the topics (and the most significant books that have been written on them) that the community of Nexa Fellows and Staff think to be fundamental to try to build a common vision in view of the "Nexian narrative" of digital revolution. During the reporting period, four seminars were organized around four important books:

January 10th, 2020
From Being Digital (Nicholas Negroponte, 1995) to The Age of Surveillance Capitalism (Shoshana Zuboff) by Antonio Santangelo

January 31st, 2020
Technology - Critical History of a Concept (Eric Schatzberg, 2018) and America by Design - Science, Technology, and the Rise of Corporate Capitalism (David Noble, 1977), by Juan Carlos De Martin

May 21st, 2020
Re-engineering humanity (Brett Frischmann, Evan Selinger, 2018), by Marco Ricolfi

June 11th, 2020
Tecnologia e Democrazia (Luciano Gallino, 2007) by Antonio Vetrò

7.5 Nexa Community

Nexa Trustees

The current list of the Nexa Trustees is available on page 61 of this report

The Trustees of the Nexa Center for Internet & Society is a group of prominent personalities from the international academic and cultural world that evaluates the activities and monitors the independence and reputation of the Center. The Board of Trustees meets at least yearly in Turin. During the meeting, which is open to all Nexa Staff and Fellows, the Board discusses with the participants the general "Internet & Society" scenario and provides advice and recommendations about future activities.

For the academic year 2020/2021 there are no new entries in the Nexa Trustees community.

Nexa Fellows and Faculty Associates

The current list of Fellows and Faculty Associates is available on page 69 of this report.

Since its creation, the Nexa Center took advantage of the cooperation of a group of more or less strictly connected fellows, who provided countless insights and enriched the knowledge-sharing activity of the Nexa Center.

The explicit model for this kind of interaction was the network of fellows of the Berkman Center for Internet & Society at Harvard University, obviously with several adaptations and on a smaller scale. While Nexa Center Fellows typically contribute pro bono to the activities of the center, some of them, the "Research Fellows", perform a research specifically for the Nexa Center as a Ph.D. Student or with some kind of research grant (e.g., as "assegnisti di ricerca").

"Faculty Fellows" are tenured professors of the Politecnico di Torino or of the University of Torino, which are the two universities forming the academic constituency of the Nexa Center. Since 2013, the Nexa Center created the position of "Faculty Associate", i.e., scholars and lecturers whose field of research covers topics of interest for the Nexa Center. Formally becoming a Fellow of the Nexa Center implies the membership in a closed mailing-list devoted to the Fellows, the possibility of taking part to internal "closed-doors" meetings at the Center (for instance, brainstorming sessions, but also the meeting of the Board of Trustees) and, of course, the possibility of publicly using the title of Nexa Center for Internet & Society Fellow, and of appearing as such on the Nexa Center website.

On top of that, depending on their research proposals, fellows may receive a limited amount of financial support (defined on a case by case basis) and reimbursement for travel and similar expenses linked to their approved projects related to the Center. During the month of June, the Nexa Center usually announces its Fellows and Faculty Associates for the next academic year.

For the academic year 2020/2021, there are no new entries in the Nexa Fellows and Faculty Associates community.

7.6 Visitors at the Nexa Center and Nexa Researchers Abroad

24-30 September 2019: Juan Carlos De Martin spent one week at the Berkman Klein Center for Internet & Society (Harvard University), participating in some research meetings as Faculty Associate of the Center.

5-9 November 2019: Francesca Bria and Evgenij Morozov spent five days in Turin on the occasion of the final meeting of "Decode" project(https://de-codeproject.eu/events/our-data-our-future-radical-tech-democratic-digital-society) and to participate in a meeting on the elaboration of the "Nexian narrative" about what has been and what will be of the digital revolution.

7-9 November 2019: Giulio De Petra spent three days in Turin to participate in a meeting on the elaboration of the "Nexian narrative" about what has been and what will be of the digital revolution, and in the events of *Festival della Tecnologia* (https://2019.festivaltecnolo-gia.it/).

16-18 December 2019: Elena Beretta spent three days to the Fondazione Bruno Kessler of Trento (https://www.fbk.eu) for a research visit dedicated to a supervision of her doctorate.

8. Outreach

8.1 Introduction

During the reporting period our communication strategy has been fine-tuned, devoting efforts to highlight the results of research projects, creating new opportunities for debate, discussion, and collaborations.

To reach this purpose, the Nexa Center continues its collaboration with the Master of Journalism "Giorgio Bocca" at the University of Turin. The Center also collaborated with the University of Turin, organizing, on January 8, 2020, the 126° Nexa Wednesday at the Rectorate Palace of the University of Turin. The seminar was hosted by Maurizio Ferraris, Professor of Theoretical Philosophy at the University of Turin and president of LabOnt; the theme of the meeting was "Metaphysics of the Web".
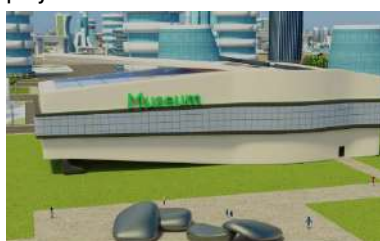
The Center actively participated in the organization of the first edition of the "Festival della Tecnologia 2019": on the 160th anniversary of its foundation, from November 7th to November 10th, the Politecnico di Torino organized a festival dedicated to technology and society that was a success in terms of audience participation and interest.

Nexa Center continues to update its new transmedia storytelling project, Nexa City, a platform which communicates its narrative through a multitude of integrated media channels and creates interesting contents using various techniques to permeate everyday life. Transmedia storytelling could also be an educational tool, wherein the audience interact with platforms, such as Twitter, Facebook, You Tube to share an engaging and immersive environment. Nexa City is a virtual city where topics such as Big Data, Internet of Things, Factory 4.0, Online privacy, and Computer Ethics are presented with an interdisciplinary approach. In Nexa City places like the courthouse, the museum, the cemetery, etc., show to which extent digital technologies influence the society.

This year we uploaded contents in the place museum: we published a paper "Opera Viva di Alessandro Bulgini. L'arte (relazionale) ai tempi dei social network" by Mattia Plazio, Francesco Ruggiero and Roberto Mastroianni, a video "Verso un'arte relazionale, Opera Viva di Alessandro Bulgini" and four audio pills "Acthung Facebook!", Opera Viva, sotto la linea di galleggiamento", "Torino, la periferia del mondo", "Tutti al B.A.R. L.U.I.G.I." (https://nex-acity.org/#!/building/8).

In order to inform the community of all the activities of the Center, we continue to publish the Nexa Newsletter, in Italian,

for all the Nexa list subscribers, and the Nexa Update, in English, for the Nexa Fellows and Trustees. The activities concerned researches, projects, education and events, such as seminars and conferences. The Nexa Newsletter and the Nexa Update also included a list of the main digital topics highlighted in the mailing list, reflecting on the impact of those issues on our society and economy.

In order to focus and promote quantitative and interdisciplinary analysis of the force of the Internet and of its impact on society, the Nexa Center continues its collaboration with DigitCult, an academic journal of international scope, double-blind peer-reviewed and open access, aiming to value international research and to present current debate on digital culture, technological innovation and social change. The Nexa Center writes a newspaper column called "Provocations and dialogs" and cures a transmedia stoytelling, which is a multimedia product that communicates its narrative through a multitude of integrated media channels for several Educational uses.

8.2 11th Annual Conference: The transformation of work in the Digital Age

On December 6th, 2019 the 11th yearly Nexa Conference on Internet & Society took place at Polytechnic University of Turin. This year the Conference focused on the impact of digital

technologies on the future of work, highlighting issues such as the relationship between workers' rights and technological innovation, or the need to support technological training

for workers of the future. Several sector experts who come from the scientific and humanistic academic fields have been involved, but also businessmen,

Public Administration, and media professionals. The Conference included researchers, professionals, and lawyers. The keynote speeches foresaw an array of different perspectives: economic, legal, societal, and engineering. For instance, an interesting keynote speech, held by Andrea Glorioso (EU Policy Officer), showed the perspective of the European Commission on the subject, while another, held by Ivana Bartoletti (Journalist, Funder of Women Leading in AI

Network) proposed a reflection on algorithmic discrimination against women. The Conference has been extensively

communicated through the website, the mailing-lists, and the social media channels of the Nexa Center and in close collaboration with the Communications Departments of the Polytechnic University of Turin and the University of Turin. The Conference was broadcasted live on our Youtube channel and supported by a live tweeting (using the hashtag #nexa2019). For additional information, see https://nexa.polito.it/conf2019).

8.3 Nexa Wednesdays

The monthly meetings open to the public called "Nexa Wednesdays" became a usual appointment for the Nexa Center fellows and friends since September 2008. At the time of finalizing this report, 129th Nexa Wednesday have taken place.

During the meetings, the audience following the live streaming can join the discussion via Twitter. The tweets are shown on a side screen. Attendance at Nexa Wednesdays as a rule exceeds 20 and sometimes 30 participants (thus, attendance frequently almost saturates the physical capacity of the Center's meeting room). In order to promote an interdisciplinary exchange on the Internet & Society field, also introducing new people to the discussion, guests of the meeting are encouraged to use a simple language, avoiding unnecessary technicalities. You can find a list of all the Nexa Wednesdays at https://nexa.polito.it/mercoledi.

This is a short summary of Nexa Wednesdays that have taken place during the last reporting period:

120th Nexa Wednesday: Beyond smart cities. Co-designing the commoning for a wise and

smart urban ecosystem; June 12, 2019; guest: Vincenzo Maria Bruno Giorgino (Università degli Studi di Torino).

121th Nexa Wednesday: Sharing Legal Knowledge; July 10, 2019; guests: Marco Ciurcina (Lawyer and Fellow Nexa Center) and Puria Nafisi Azizi (Dyne.org).

122th Nexa Wednesday: The copyright directive and its implementation; September 11, 2019; guest: Marco Ricolfi (Co-Director Nexa Center).

123th Nexa Wednesday: Legal Knowledge Representation and Reasoning in a Linked Open Data Framework; October 9, 2019; guest: Enrico Francesconi (European Commission, Publications Office of the European Union).

124th Nexa Wednesday: Co-operation and coherence mechanisms in the GDPR: the state of the art after 18 months of application; November 13, 2019; guests: Monica A. Senor (Funzionario presso l'Autorità garante per la protezione dei dati personali) and Massimo Durante (Università degli Studi di Torino e Fellow Nexa Center).

125th Nexa Wednesday: The project of the technical object and the project of the terrestrial space; December 11, 2019; guests: Alessandro Armando (Politecnico di Torino) and Giovanni Durbiano (Politecnico di Torino).

126th Nexa Wednesday: Metaphysics of the Web; January 8, 2020; guest: Maurizio Ferraris (Università degli Studi di Torino);

127th Nexa Wednesday: The man-machine symbiosis; February 12, 2020; guest: Simone Arcagni (Università di Palermo e Nexa Faculty Associates).

128th Nexa Wednesday: Artificial faces; April 8, 2020; guest: Massimo Leone (Università degli Studi di Torino).

129th Nexa Wednesday: Evaluation and comparison of open source software for Public Administrations; May 13, 2020; guests: Guido Pera (Responsabile del Centro di competenza AgID per il riuso del software), Antonio Vetrò (Dauin Researcher e Senior Research Fellow Nexa Center), Marco Conoscenti (Post-Doc Researcher Nexa Center).

8.4 Nexa Lunch Seminars

Since May 2012, the Nexa Center launched a series of meetings entitled "Nexa Lunch Seminars" held on the fourth Wednesday of the month, from 13.00 to 14.00. As in the case of Nexa Wednesdays, it is possible to follow all the meetings live over the Internet by streaming at: http://nexa.polito.it/upcoming-events. Audience interactions and dissemination are dealt in the same way as for the Nexa Wednesdays. A list of the Nexa Lunch Seminars is available at: http://nexa.polito.it/lunch-seminars.

This is a short summary of Nexa Lunch Seminars that have taken place during the last reporting period:

70th Nexa Lunch Seminar: Understanding Airbnb in Southern European cities; June 26, 2019; guest: Chiara Iacovone (Future Urban Legacy Lab).

71th Nexa Lunch Seminar: The flight of drones in 2019; July 24, 2019; Giacomo Conti (Università degli Studi di Torino).

72th Nexa Lunch Seminar: Geranium, semantic technologies and deep learning for the publications of the Politecnico di Torino; September 25, 2019; guest: Giuseppe Futia (Nexa Center).

73th Nexa Lunch Seminar: People-Driven Innovation; October 23, 2019; guest: Alberto Robiati (Fondazione Human+).

74th Nexa Lunch Seminar: The big data subject: from individual to user; November 27, 2019; guest: Irene Domenicale (Università degli Studi di Torino).

75th Nexa Lunch Seminar: Internet censorship in 2019: updates from the Observatory of Network Interference; January 22, 2020; guest: Arturo Filastò (Fellow Nexa Center).

76th Nexa Lunch Seminar: Artificial intelligence and radiology: from design to clinical practice; March 25, 2020; guest: Lia Morra (Politecnico di Torino).

77th Nexa Lunch Seminar: Ethics and Artificial Intelligence: the approach of the Telephone Companies; April 22, 2020; guest: Giacomo Conti (Università degli Studi di Torino).

78th Nexa Lunch Seminar: Deep learning and semantic graphs for the scientific community of the Politecnico di Torino; May 27, 2020; guest: Giovanni Garifo (Nexa Center).

8.5 Nexa Research Seminars

Since 2018 the Nexa Center has launched a new series of meetings entitled "Nexa Research Seminars", which has involved Nexa staff and Nexa fellows. The Nexa Research Seminars promotes in-depth discussion on topics related to Internet and Society. The talks are meant to facilitate digital education by generating discussion on recently published books and on-going research projects.

This is a short summary of Nexa Research Seminars that have taken place during the last reporting period:

From the transmission Men and prophets of Rai Radio 3: Oikonomia. Meditations on capitalism and the sacred: June 12, 19 - July 3, 10, 17, 2019; with Luigino Bruni (LUMSA).

Being Digital (Negroponte, 1995), The age of surveillance capitalism (Zuboff, 2019): January 10, 2020; held by Antonio Santangelo (Nexa Center).

Technology – Critical History of a Concept (Eric Schatzeberg, 2018), America by Design – Science, Technology, and the Rise of Corporate Capitalism (David Noble, 1977): January 31, 2020; held by Juan Carlos De Martin (Nexa Center).

Re-engineering humanity (Brett Frischmann, Evan Selinger, 2018): May 21st, 2020; held by Marco Ricolfi

8.6 Other Meetings

Other meetings organized by the Center during the reporting period have been:

Festival della Tecnologia 2019: on the 160th anniversary of its foundation, from November 7th to November 10th, the Politecnico di Torino organized a festival dedicated to technology and society, of which the Nexa Center was an active partner. The initiative proved to be a great opportunity for universities, citizens, companies, the public administration and the third sector to meet, get informed and reflect on the great challenges of an increasingly technological society. Here the meetings held by some of the trustees and fellows of the Nexa Center within the festival:

The Hacker Universe: November 8, 2019; chaired by Marco Ciurcina (Fellow Nexa Center).

How do teenagers live in the digital age? November 8, 2019; held by Sandra Cortesi (Trustee Nexa Center).

Intangible capitalism: November 8, 2019; held by Stefano Quintarelli (Trustee Nexa Center).

Open data: common good: November 9, 2019; held by Federico Morando (Fellow Nexa Center).

If the machine knows who you are: November 9, 2019; held by Simone Arcagni (Faculty Associates Nexa Center).

The dark side of force. Work and technological revolution from Marx to Amazon: November 9, 2019; held by Enrico Donaggio (Faculty Fellow Nexa Center) in dialogue with Antonio Casilli (Faculty Fellow Nexa Center).

Technologies for humans: November 9, 2019; held by Ugo Pagallo (Trustee Nexa Center).

The challenges of the cybersecurity: November 9, 2019; held by Carlo Blengino (Fellow Nexa Center).

Bitcoin and blockchain: many talks about it, but what is it about? November 9, 2019; held by Marco Conoscenti (Nexa Center).

Turin technological tour, between art and innovation: November 9, 2019; held by Bruce Sterling (Trustee Nexa Center).

Digital work that makes artificial intelligence (im)possible: November 10, 2019; held by Antonio Casilli (Faculty Fellow Nexa Center) in dialogue with Enrico Donaggio (Faculty Fellow Nexa Center).

Is digital a danger to democracy? November 10, 2019; held by Fabio Chiusi (Fellow Nexa Center).

The new printers' right and digital platform: November 10, 2019; held by Marco Ricolfi (Co-Director Nexa Center).

Decode Symposium 2019 – Our Data, Our Future: Radical Tech for a Democratic Digital Society: November 5-6, 2019; this year the Symposium focused on constructing viable democratic alternatives to the Big Tech and discussed the benefit of decentralized and privacy preserving technologies as alternatives against the digital economy's tendencies towards centralization and monopolization. Conference is curated by Francesca Bria (Trustee Nexa Center); guests: Anna Masera (Trustee Nexa Center), Bruce Sterling (Trustee Nexa Center), Juan Carlos De Martin (Co-Director Nexa Center), Luca De Biase (Trustee Nexa Center).

8.7 External Events

External events, which the Center has contributed to during the reporting period, have been:

Tavola rotonda ISO 25000 on new product standards of software, web and app, data and IT services: Antonio Vetrò presented his speech entitled: "Software and data bias in SQuaRE" at the event Tavola rotonda ISO 25000 in Rome, on October 30, 2019.

Future Urban Legacy Lab FULL: Antonio Vetrò participated to the event FULL organized by Future Urban Legacy Lab as co-speaker of the seminar entitled "Cities and inequalities (and digital technologies)", with the participation of Francesca Governa and Antonio Santangelo (Turin, September 9, 2019).

Festival del Futuro: Antonio Vetrò participated to the Festival del Futuro, which took place in Verona on November 16-17, 2019, as chairman and speaker of the panel entitled "The government of digitalization and the role of the university". The other speakers of the panel were Andrea Granelli (President Kanso), Alberto Mattiello (Comitato Scientifico Piccola Industria di Confindustria) and Carlo Blengino (Fellow Nexa Center).

"Smart" city and data management: Antonio Vetrò was invited to speak at the cycle of meetings 2019-2020 "How's the city? Where is the city going?" at Unione Culturale Franco Antonicelli organized by Gruppo Città & Territorio, in Turin, on February 11, 2020. His talk, "Smart" city and data management, focused on the digital revolution and its effect on our communication system, reflecting on the enormous availability

of data, connections and services by citizens. The other speakers of the talk were Alberto Vanolo (Unito) and Niccolò Cuppini (SUPSI - Scuola Universitaria Professionale della Svizzera Italiana), and the chairman of the meeting was Davide Derossi (architect).

ICUAS 2019: on June 11-14, 2019, Eleonora Bassi was invited to speak at the International Conference on Unmanned Aircraft Systems, in Atlanta, Georgia (USA). The major themes of the conference were: design for trusted and assured autonomy, metrics for autonomy, and design for resilience; these focus area topics were center-stage in the attempt to design and build high confidence UAS/RPAS.

"Bitcoin and Blockchain: many talk about it, but what is it about?": Marco Conoscenti was invited at the Festival della Tecnologia (Turin, November 6-8, 2019) to talk about bitcoin, a cryptocurrency managed collectively by the network, without any central authority responsible for it, and bitcoin's economic transactions that are

stored in the blockchain, a public register, distributed and difficult to tamper with.

"Implementation of the guidelines for the acquisition and reuse of software for public administration": Marco Conoscenti participated in the laboratory "Implementation of the guidelines for the acquisition and reuse of software for public administration", which took place in Venice on December 3, 2019. On this occasion he presented to the public Administrations the comparative evaluation procedure of reused or open source software, developed by the Nexa Center in collaboration with AgID.

32nd Canadian Conference on Artificial Intelligence: Elena Beretta presented her paper "The Invisible Power of Fairness. How Machine Learning Shapes Democracy" (E. Beretta, A. Santangelo, A. Vetrò, B. Lepri, J.C. De Martin) at the 32nd Canadian Conference on Artificial Intelligence (Kingston, Canada, May 28-31, 2019).

Tracking Innovation Trajectories in the Complex Economy

- Network analysis and big data for risk mitigation, Big data for economics and innovation panel: Elena Beretta was invited to chair the workshop "Tracking Innovation Trajectories in the Complex Economy - Network analysis and big data for risk mitigation, Big data for economics and innovation panel" that was held at Talent Garden Fondazione Agnelli, in Turin, on October 7-9, 2019; the event focused on innovation as an evolutionary process in a complex space involving patents, countries, innovators, assignees, companies and products, thus reflecting on the importance of forecasting innovation trajectories and emerging value chains to mitigate and manage the innovation risks and their impact.

DataBeers: Giuseppe Futia held the seminar "Semantic Modeling Through Deep Learning" at the event DataBeers, in Turin, on January 14, 2019. The topic of the event was data analysis and its use in our everyday practices, reflecting on the possibility to build services on data or to create artistic data driven projects.

8.8 Website

During the ongoing year the site has been featured with in-depth analysis aiming to drive changes to contents placement in order to ensure more visibility into research, publishing and social networks.

During the reporting period the website collected a discrete amount of traffic: about 22.000 sessions from 21.000 different visitors, with an increase of 14.6% and 9.7% respectively, compared to the last year. In addition, we worked on pushing more contents through Nexa social media channel. This choice has been pursued by spreading not only the contents relating to the events and meeting of the Center, but also the most significant current news regarding the topics of interest

to the Center. It is worth noting that in 2019 – 2020 our website had three exceptional peaks in popularity in June 2019, in occasion of the 70th Nexa Lunch Seminar, focused on the understanding Airbnb in Southern European Cities, in November 2019, in occasion of the first edition of the Festival della Tecnologia 2019 organized by Politecnico di Torino, of which the Nexa Center was an active partner, and in December 2019, with the organization of the 11th Nexa Annual Conference.

During the reporting period the website obtained a good international exposure: if 75.8% of traffic came from Italy, about 4.1% came from the US, about 1.9% from Germany, about 1.7% from UK, about 1.6% from France,

(about 2% from Sweden and the UK, and about 1% each from India, Spain and Canada). Starting from January 2020, the Center has decided to adopt Matomo for data analysis instead of Google Analytics. Matomo is in fact the leading Free/Libre open analytics platform and it is a full-featured PHP MySQL software program that you download and install on your own webserver. Matomo aims to be a Free software alternative to Google Analytics and is already used on more than 1,400,000 websites.

The graphs, relevant to the reporting period, (Figure 1 from Google Analytics and Figure 2 from Matomo), which includes daily page-views of the Nexa website, show peaks in June,

November and December 2019, in the first graph, and a peak in April 21, 2020, in the second graph, with a registration of 9,366 unique visitors in that day due to the publication of an open letter on contact tracing and democracy during coronavirus pandemic addressed to policy makers.
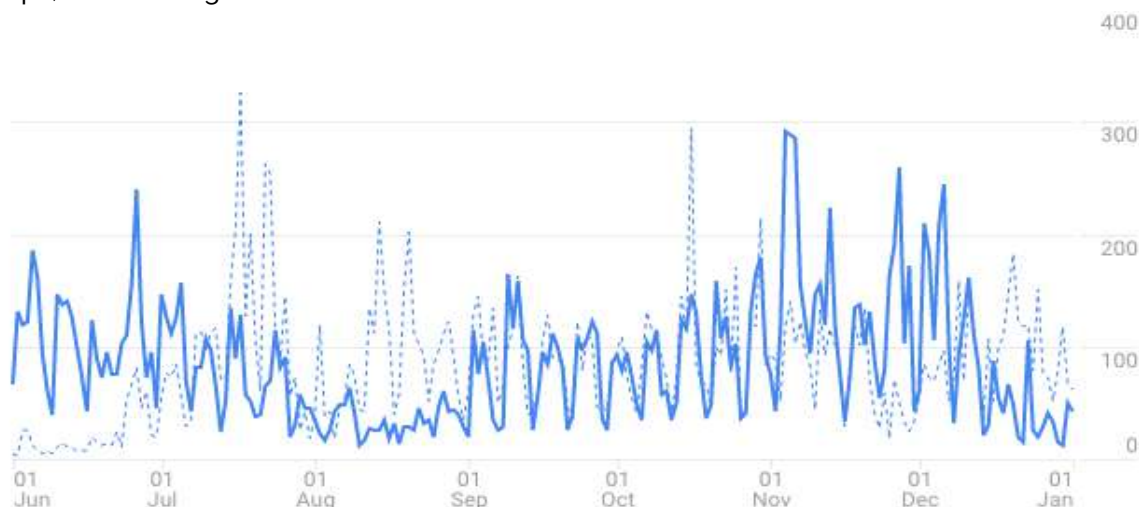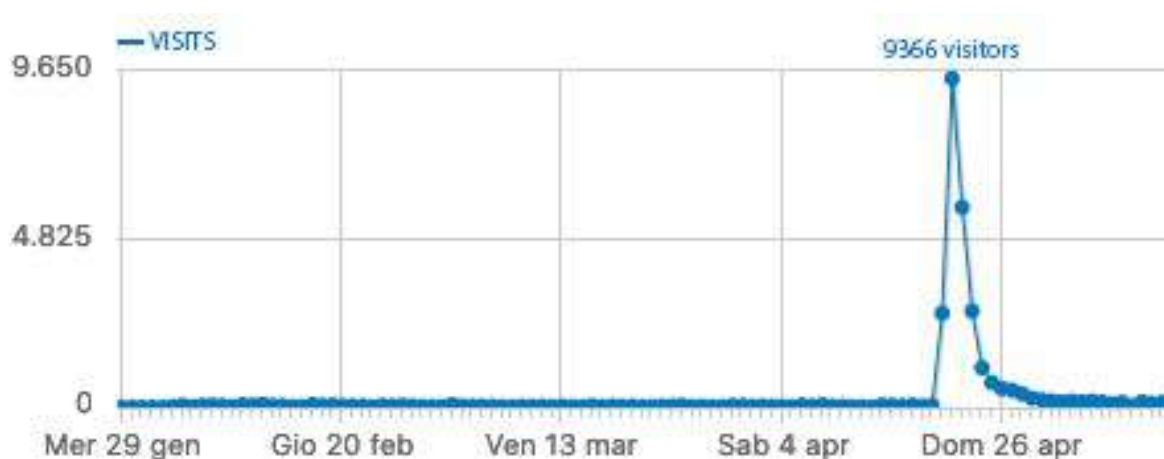

Fig. 1

Fig. 2

8.9 Mailing list and social media

The Center has three main mailing-lists:

The Nexa-Fellows mailing-list is a private list connecting the core Nexa Center collaborators; it is used for various purposes, including confidential communications and to coordinate the activities of the fellows on specific projects; the list has about 52 members (Nexa Center fellows, Faculty Associates, and staff) and relatively low traffic (about 123 messages since June 2019 until April 2020);

The Nexa mailing-list is used to inform all the fellows and friends of the Nexa Center about the events and publications of the Center, and to circulate information regarding books, reports and other materials about "Internet & Society" in general; the list is open to anybody, upon subscription, and all the members can both read and post new messages; the list has about 824 members (787 one year ago) and collected 1,992 posts since June 2019 until April 2020;

The Nexa-Announce mailing-list is a low traffic list used to spread information about Nexa Center public events and publications; it is open to anybody, upon subscription, in read only mode. The Center also uses various internal mailing-lists to connect the members of the staff and/or some sub-sets of them working on specific projects.

During the reporting period, the Center also increased the use of social networks Facebook (https://www.facebook.com/nexa.center) and twitter (https://twitter.com/nexacenter). On Twitter,

the Center has 4,020 followers (an increase of 6% over the previous year). The total number of fans on Facebook is 2,301 (an increase of 5% over the previous year). YouTube Channel: the channel has 286 subscribers and contains a total of 294 videos; lifetime views: 41,115; reporting period: about 4,300 views for a total of 28,368 minutes watched. The most watched video is the 128° Nexa Wednesday, held by Massimo Leone, Professor of Philosophy of Communication, Semiotics of Culture and Semiotics of the Image at the Department of Philosophy and Educational Sciences of the University of Turin.

8.10 DigitCult Journal

For ten years, the second and fourth Wednesdays of the month, the Nexa Center for Internet and Society has turned into a place where people discuss and analyze topics related to digital culture. Experts of various disciplines (scientists, jurists, sociologists, philosophers, journalists, artists and startuppers) present their researches and the issues that their work has tackled to a wide and heterogeneous audience, to promote public debates and the circulation of ideas.

The new section Parole in codice (Words in code) intends to enhance the work of scientific divulgation of the Centro Nexa on the Internet and Society, selecting some of the most fascinating and debated topics during the meetings and proposing them, in the form of in-depth analysis and with new features, to the readers of the magazine DigitCult (www.digit-cult.it/index.php/dc), with special attention to its online version. Words in code thus becomes an open window on the future, an original story about the relationship between man and the digital realm. Multimedia is the format proposed for the new section. Starting from the theme chosen from time to time, the Nexa Center on the Internet and Society develops five different contents, which can also be used individually but which can be summarized and followed according to the four phases of the canonical narrative scheme of greimasian type (Manipulation, Competence, Performance, Sanction).

Using the canonical narrative scheme, we organize the elements into a structure consisting of five components: the action component can be broken down into two components: competence, which results from the factors that are required in order to accomplish the action (wanting-to-do, having-to-do, knowing-how-to-do, and being-able-to-do) and performance, the actual realization of the action, made possible by the acquisition of competence. Manipulation is the component that deals specifically with wanting-to-do and having-to-do. The last component, sanction, deals with evaluating whether the action was truly realized, and the corresponding retribution (reward or punishment) that the performing subject has incurred.

The contents produced are then collected and published in a web page / interactive map "linked" to the on-line version of the DigitCult magazine. Map that ideally represents the city of the future and where the user, navigating from place to place, has the opportunity to explore topics and topics related to the digital culture. Among the contents realized, the scientific article - the heart and pivot of the storytelling path outlined above - is published as a paper in the paper version of the DigitCult Journal.

"Opera Viva" by Alessandro Bulgini. The (relational) art at the time of social networks, (https://nexa.polito.it/nexacen-terfiles/140-1-771-1-10-20191229.pdf) by Mattia Plazio, Francesco Ruggiero, Roberto Mastroianni, Published 31 December 2019.

Starting from "Opera Viva" by Alessandro Bulgini (myhomegallery.org), which has become an emblematic example of relational art that unites social networks, performance and visual production, the article – through the dialogue between Bulgini himself and the philosopher and art critic Roberto Mastroianni – proposes to investigate the connection between performative, imaginary and social network practices in the building of a community space able to hold together virtuality and a socio-political dimension.

Annex I - Nexa People

ANNEX I — NEXA PEOPLE

Some pieces of biographical information about the co-directors, staff, trustees and fellows of the Center follow.

1.1 Directors

Juan Carlos De Martin – Co-Founder and Co-Director

See dedicated box at page 3 of the EXECUTIVE SUMMARY.

Marco Ricolfi – Co-Founder and Co-Director

See dedicated box at page 3 of the EXECUTIVE SUMMARY.

1.2 Trustees

Philippe Aigrain

Dr. Philippe Aigrain was trained as a mathematician and theoretical computer scientist and holds a Doctorate and a "Habilitation à Diriger les Recherches" qualification from University Paris 7. From 1972 to 1981, he worked in software engineering research labs of software companies. He was a research fellow at U.C. Berkeley in 1982. Since then, and before joining the European Commission in 1996, he headed research teams in the field of computer processing, indexing, retrieval and user interface for audiovisual media (video, music, still images). He is the author of more than 50 research and technology assessment papers. He is one of the founders of La Quadrature du Net, a non-profit association that defends fundamental rights in the digital sphere in France and in Europe. He is active as an analyst of the stakes of the information revolution and engaged in actions for the reform of intellectual rights regimes. He has authored books on this subject among which: "Cause commune: l'information entre bien commun et propriété", Fayard 2005 (translated in Italian and Arabic), and "Sharing: Culture and the Economy in the Internet Age", Amsterdam Univ. Press, 2012 (translated in Polish). His books and numerous papers on the information commons, access to knowledge and intellectual rights are accessible under CC licenses on his blog paigrain.debatpublic.net. Philippe Aigrain also writes poetry and short fiction pieces that are published on his literary blog atelierdebricolage.net. He is President of Créateurs et associés, the editorial firm of publie.net, a reference publisher for French-speaking literary works whose forms originate or thrive in literature written and shared on the Web.

Yochai Benkler

Yochai Benkler is the Berkman Professor of Entrepreneurial Legal Studies at Harvard, and faculty co-director of the Berkman Center for Internet and Society. Before joining the faculty at Harvard Law School, he was Joseph M. Field '55 Professor of Law at Yale. He writes about the Internet and the emergence of networked economy and society, as well as the organization of infrastructure, such as wireless communications. In the 1990s he played a role in characterizing the centrality of information commons to innovation, information production, and freedom in both its autonomy and democracy senses. In the 2000s, he worked more on the sources and economic and political significance of radically decentralized individual action and collaboration in the production of information, knowledge and culture. His work traverses a wide range of disciplines and sectors and is taught in a variety of professional schools and academic departments. In real world applications, his work has been widely discussed in both the business sector and civil society. His books include *The Wealth of Networks: How social production transforms markets and freedom* (2006), which received the Don K. Price award from the American Political Science Association for best book on science, technology, and politics, the American Sociological Association's CITASA Book Award an outstanding book related to the sociology of communications or information technology, the Donald McGannon award for best book on social and ethical relevance in communications policy research, was named best business book about the future by Stategy & Business, and otherwise enjoyed the gentle breath of Fortuna. In

civil society, Benkler's work was recognized by the Electronic Frontier Foundation's Pioneer Award in 2007, and the Public Knowledge IP3 Award in 2006. His articles include Overcoming Agoraphobia (1997/98, initiating the debate over spectrum commons); Commons as Neglected Factor of Information Production (1998) and Free as the Air to Common Use (1998, characterizing the role of the commons in information production and its relation to freedom); From Consumers to Users (2000, characterizing the need to preserve commons as a core policy goal, across all layers of the information environment); Coase's Penguin, or Linux and the Nature of the Firm (characterizing peer production as a basic phenomenon of the networked economy) and Sharing Nicely (2002, characterizing shareable goods and explaining sharing of material resources online). His work can be freely accessed at benkler.org.

Maurizio Borghi

Maurizio Borghi is Professor of Law at Bournemouth University, where he is the Director of the Centre for Intellectual Property Policy & Management (CIPPM). Prior to joining Bournemouth, he has been lecturer at Brunel University Law School, research fellow at Bocconi University of Milan and visiting scholar at the Center for the Study of Law and Society at the University of California, Berkeley. His research is primarily focused on developing a right-based understanding of law for the information society. In this vein, he has extensively published on the subjects of copyright, data protection, and the role of law in the digital age. His monograph *Copyright and Mass Digitization* (co-authored with Stavroula Karapapa) has been published in 2013 by Oxford University Press.

Francesca Bria

Francesca Bria is a senior expert and advisor on technology and innovation policy. She is Visiting Professor at the Institute for Innovation and Public Purpose, UCL London and Associate Professor at ESADE Business School. She is currently the Commissioner of Digital Technology and Innovation for the City of Barcelona in Spain and she is leading the DECODE project on data sovereignty in Europe. Francesca is an advisor to the European Commission on next generation Internet and smart city policies. She has a PhD in Innovation and Entrepreneurship from Imperial College, London and MSc on Digital Economy from University of London, Birbeck. As Senior Programme Lead at Nesta, the UK Innovation Agency, she has led the EU D-CENT project, the biggest European Project on digital democracy and digital currencies. She also led the DSI project on Digital Social Innovation in Europe, advising the EU on digital social innovation policies. She has been teaching in several universities in the UK and Italy and she has advised governments, public and private organizations and movements on technology and innovation policy, and its socio-economic impact. Francesca has been listed in the Top 50 Women in Tech by the Forbes Magazine, and in the World's top 20 most influential people in digital government by Apolitical. She has been also featured in the Italian Magazine Repubblica "D", amongst the 100 Women Changing the World. Francesca Bria is an adviser for the European Commission on Future Internet and Innovation Policy. She is currently the new Commissioner of Digital Technology and Innovation for the city of Barcelona in Spain.

Mario Calderini

Mario Calderini, a Ph.D. in Economics from the University of Manchester, is full Professor at Politecnico di Milano, School of Management, where he teaches Social Innovation. He is the Director of Alta Scuola Politecnica and Executive Vice President of Fondazione Politecnico. He is the Director of Tiresia, the Politecnico di Milano School of Management's Research Centre for Impact Finance and Innovation. He is a member of the Scientific Advisory Board of the Minister of University Research and Innovation and a Government's Sherpa for the G7 Italian Presidency 2017. His numerous publications in highly ranked international journals cover several topics in the field of innovation and social impact finance. He has been a member of the G8 Task Force for Social Impact Investment, he chaired the Italian Advisory Board on

Social Impact Finance, he is the President of the Scientific Committee of the Social Impact Agenda for Italy Association (Italy's NAB). He sits in the Italian Government's Advisory Group on Social Entrepreneurship and Impact Measurement and he contributed to promote the social innovation agenda in Italy, launching the sector's first public consultation. He has been part of the Government's Advisory Group that drafted the new law on social entrepreneurship. He is currently a member of the Government's Task Force on Social Impact Investment. He sits in the Director's Board of the newly established Nesta Italy Foundation.

Sandra Cortesi

Sandra Cortesi is a Fellow at the Berkman Klein Center for Internet & Society at Harvard University and the Director of Youth and Media. She is responsible for coordinating the Youth and Media's policy, research, and educational initiatives, and is leading the collaboration between the Berkman Klein Center and UNICEF. At Youth and Media Sandra works closely with talented young people and lead researchers in the field as they look into innovative ways to approach social challenges in the digital world. Together with Berkman Klein Center's Executive Director Urs Gasser and the Youth and Media team, she focuses on topics such as inequitable access, information quality, risks to safety and privacy, skills and digital literacy, and spaces for participation, civic engagement, and innovation. Sandra works in close collaboration with the Digital Asia Hub and FIR.

Luca De Biase

Luca De Biase is a journalist and writer. He is the founder and chief editor of Nòva, the science and technology crossplatform section at Il Sole 24 Ore. He is the president of the scientific committee at MediaCivici Association, which is meant to research and help improve the information ecosystem emerging in the social media. He is author of Homo Pluralis, Economia della felicità, Il mago d'ebiz and In nome del popolo mondiale. He blogs at blog.debiase.com and lucadebiase.nova100.ilsole24ore.com. He edited with Giorgio Meletti "Bidone.com". He contributed to the project and implementation of various initiatives, such as Skillpass, ScienceXpress, I nonni raccontano, EquiLiber, Reporters Online. He teaches Knowledge Management and at Pisa university, journalism at Padova university and Sissa university. The Media Ecology Association awarded Luca with The James W. Carey Award for Outstanding Media Ecology Journalism 2016.

Josef Drexl

Professor Dr. Josef Drexl, LLM, graduated from the University of Munich and holds a Ph.D. degree (1990) and a habilitation degree of the same University, in addition to an LL.M. degree from the University of California at Berkeley. Josef Drexl worked as a law professor at the Universities of Würzburg and Munich from 1997 to 2006; he continues to be an honorary professor at the University of Munich. Since 2002 he has been a director of the Max Planck Institute for Innovation and Competition in Munich. In 2003, Professor Drexl was elected the first chair of the Academic Society for Competition Law (ASCOLA). As the Chair of the Maniging Board of the Munich Intellectual Property Law Center (MIPLC) he is responsible for an internationally renowned LL.M. program in IP. He acted as a visiting professor at Oxford University, LUISS University (Rome) and New York University. He regularly teaches in the LL.M. program in EU law at the University of Paris 2 Panthéon-Assas. Professor Drexl is an expert in international and European competition law, intellectual property law, consumer law and WTO law.

Brett Frischmann

Brett Frischmann joins Villanova as The Charles Widger Endowed University Professor in Law, Business and Economics, effective August 1, 2017. In this new role, Professor Frischmann will promote cross-campus research, programming and collaboration; foster high-visibility academic pursuits at the national and international levels; have the ability to teach across the University; and position Villanova as a thought leader and innovator at the intersection of law, business and economics. A renowned scholar in intellectual property and Internet law, Professor Frischmann comes to Villanova from Cardozo Law School at Yeshiva University, where he was director of the Cardozo Intellectual Property and Information Law Program (2011-2016) and a Professor of Law. He is an affiliated scholar of the Center for Internet and Society at Stanford Law School, and a trustee for the Nexa Center for Internet & Society, Polytechnic University of Turin. Professor Frischmann most recently served as the Microsoft Visiting Professor of Information and Technology Policy at Princeton University's Center for Information and Technology Policy. Professor Frischmann's work has appeared in leading scholarly publications, including Columbia Law Review, Cornell Law Review, Journal of Institutional Economics, Journal of Economic Perspectives, University of Chicago Law Review, and Review of Law and Economics, among others. His forthcoming book co-authored with philosopher Evan Selinger, Being Human in the 21st Century: How Social and Technological Tools are Reshaping Humanity (Cambridge University Press), will examine techno-social engineering of humans, various 'creep' phenomena and modern techno-driven Taylorism. Professor Frischmann's books on the relationships between infrastructural resources, governance, commons and spillovers include Infrastructure: The Social Value of Shared Resources (Oxford University Press, 2012); Governing Knowledge Commons (Oxford University Press, 2014, with Michael Madison and Katherine Strandburg); and Governing Medical Knowledge Commons (Cambridge University Press, forthcoming 2017, with Michael Madison and Katherine Strandburg). Prior to his appointment at Cardozo Law, Professor Frischmann was on the faculty of the Loyola University Chicago, School of Law from 2002 to 2010. He also has served as a visiting professor at numerous institutions, including Columbia Law School, Cornell Law School, Duke Law School, Fordham University School of Law and Syracuse University College of Law.

Jean-Claude Guédon

Prof. Jean-Claude Guédon began his career at Glendon College (York University) in Toronto, Ontario in 1970 and has been a professor at the Université de Montréal since 1973, first in the Institut d'histoire et de sociopolitique des sciences, and, since 1987, in the Département de littérature comparée. He is a long-time member of the Internet Society serving as co-chair of the program committee in 1996, 1998 and 2000, and member of the same committee in 1997, 1999 and 2002. In 1991, with Bill Readings and Walter Moser, he launched the first electronic scholarly journal in Canada: Surfaces. Between 1998 and 2003, he was Chair of the Advisory Board for CNSLP (Canadian National Site Licence Project, now known as CRKN (Canadian Research Knowledge network). From 2002 until 2006, he was a member of OSI's Information Program sub-board. Between 2003 and 2007, he was a member of the Advisory Board of eIFL (Electronic Information for Libraries). In 2006 he was elected (until November 2008) Vice-President of the Canadian Society for the Humanities and Social Sciences. He has advised numerous governmental bodies, including the Ministère de la Recherche (France) for their e-publication project in the humanities and the social sciences; the Agence de la francophonie for matters pertaining to new technologies; the Quebec Minister of Communication in charge of the information highway; and the Quebec Ministry of education for the integration of the new technologies into the curriculum. He regularly acts as expert for the European Commission. He is also on the editorial board of several journals, and his three books are all available in Italian. He is on the advisory board of Redalyc, an open access publishing platform based in Mexico, and he was invited to write an analysis for the 15th anniversary of the Budapest Open Access Initiative: "Open Access: Toward the Internet of the Mind". During his visit at the Nexa Center, prof. Guédon interacted with the staff and the fellows of the Nexa Center and worked on a research whose findings were presented during the 31st NEXA Wednesday (May 11, 2011): Toward a distributed mass digitization.

Lucie Guibault

After nearly twenty years at the Institute for Information Law of the University of Amsterdam, Dr. Lucie Guibault will join as of 1 July 2017 the Schulich School of Law of Dalhousie University in Halifax, Nova Scotia, Canada. She studied law at the Université de Montréal (Canada) and received in 2002 her doctorate from the University of Amsterdam, where she defended her thesis on Copyright Limitations and Contracts: An Analysis of the Contractual Overridability of Limitations on Copyright. She is specialized in international and comparative copyright and intellectual property law. Lucie Guibault has been carrying out research for the European Commission, Dutch ministries, UNESCO and the Council of Europe. Her main areas of interest include copyright and related rights in the information society, open content licensing, collective rights management, limitations and exceptions in copyright, and author's contract law. Lucie will pursue her work on the impact of digital technology on the development of intellectual property norms at the Law and Technology Institute of the Schulich School of Law.

Anna Masera

Anna Masera is an Italian journalist and Public Editor at La Stampa. She is also Director of the Labs and the Newspaper "Futura" of the Giorgio Bocca Journalism Master at the University of Turin. From 2014 to 2015, Anna was Head of Press and Communication Manager of the Chamber of Deputies. Anna Masera graduated in History at Yale in 1983. In 1984 she was awarded a master's degree in journalism from the Columbia University. In 1986 she started to work as journalist for "Italia Oggi", an Italian daily newspaper. Then she worked for the press agency Reuters and later for Mondadori, writing for two monthly magazines: "Fortune Italia" and "Espansione". In the meantime, she was also a consultant for the talk show "Milano, Italia" of the Italian public broadcaster. She started to work for Panorama "life and style" section in 1994 when Internet started to gain widespread diffusion. Since then she is following the development of new media: first she founded "Panorama Web", then she was hired by "La Stampa" in 1999 to launch their website.

Angelo Raffaele Meo

1961-1969 Assistant Professor of Electrical Engineering at Politecnico di Torino. 1970- Full Professor of Computer Science at Politecnico di Torino. 1970-1999 head of "Centro per l'Elaborazione Numerale dei Segnali" CNR. 1979-1985 director of the "Progetto Finalizzato Informatica", CNR. 1991-1996 scientific director of "Centro di Supercalcolo Piemonte". He has published more than one hundred papers dealing with computer science. In particular, he investigated switching theory, hardware design, signal processing, speech analysis and synthesis, and pattern recognition. He has coordinated many academic and industrial national research projects on computer science. He was president of the Academy of Sciences of Torino. In 2002 he was called by the Italian Minister of Technology to preside at a Commission entrusted with the task of promoting open source in the Italian Public Administration.

Charles Nesson

Charles Rothwell Nesson is the William F. Weld Professor of Law at Harvard Law School and the founder of the Berkman Center for Internet & Society and of the Global Poker Strategic Thinking Society. He is author of Evidence, with Murray and Green, and has participated in several cases before the U.S. Supreme Court, including Daubert v. Merrell Dow Pharmaceuticals. In 1971, Nesson defended Daniel Ellsberg in the Pentagon Papers case. He was co-counsel for the plaintiffs in the case against W.R. Grace that was made into the film A Civil Action. Nesson attended Harvard College as an undergraduate, and then Harvard Law School where he joined the list of only a handful of people in history to have graduated summa cum laude. Nesson was a law clerk to Justice John Marshall Harlan II on the United States Supreme Court, 1965 term. He then worked as a special

directions his future artwork would take: Division and Multiplication of the Mirror and Art Takes on Religion. In the early eighties he made a series of sculptures in rigid polyurethane, translated into marble for his solo show in 1984 at Forte di Belvedere in Florence. From 1985 to 1989 he created the series of "dark" volumes called Art of Squalor. During the nineties, with Project Art and with the creation in Biella of Cittadellarte - Fondazione Pistoletto and the University of Ideas, he brought art into active relation with diverse spheres of society with the aim of inspiring and producing responsible social change. In 2003 he won the Venice Biennale's Golden Lion for Lifelong Achievement. In 2004 the University of Turin awarded him a laurea honoris causa in Political Science. On that occasion the artist announced what has become the most recent phase of his work, Third Paradise. In 2007, in Jerusalem, he received the Wolf Foundation Prize in the Arts, "for his constantly inventive career as an artist, educator and activist whose restless intelligence has created prescient forms of art that contribute to fresh understanding of the world."

David Post

Prof. David Post recently retired from his position as the I. Herman Stern Professor of Law at the Beasley School of Law at Temple University, where he taught intellectual property law and the law of cyberspace. He is currently a contributor to the influential Volokh Conspiracy blog at the Washington Post, a Fellow at the Center for Democracy and Technology, and an Adjunct Scholar at the Cato Institute, while maintaining an active legal practice focused on the First Amendment. Professor Post is the author of In "Search of Jefferson's Moose: Notes on the State of Cyberspace" (Oxford, 2009), a Jeffersonian perspective on Internet law and policy, "Cyberlaw: Problems of Policy and Jurisprudence in the Information Age" (West, 4th Ed 2011) (with Brett Frischmann, Paul Berman, and Tricia Bellia), and numerous scholarly articles on intellectual property, the law of cyberspace, and complexity theory. He holds a Ph.D. in physical anthropology and taught in the Anthropology Department at Columbia University before attending Georgetown Law Center, from which he graduated summa cum laude in 1986. After clerking with then Judge Ruth Bader Ginsburg on the DC Circuit Court of Appeals, he spent 6 years at the Washington D.C. law firm of Wilmer, Cutler & Pickering, after which he then clerked again for Justice Ginsburg during her first term at the Supreme Court (1993 - 1994), before joining the faculty of the Georgetown University Law Center (1994 – 1997) and then Temple University Law School (1997 – 2015). Professor Post's writings can be accessed online at www.davidpost.com

Stefano Quintarelli

Stefano Quintarelli is a serial entrepreneur (and prolific blogger), who pioneered the commercial development of the Internet in Italy. In 2013 he was elected to the Chamber of Deputies of the Italian Parliament as an independent candidate in the list "Scelta Civica". He graduated in IT science at the University of Milan. In 1989 he founded MI.NE.R.S. (Milano Network Researchers and Students), the student telecom association that developed the first e-mail independent system in Italy. In 1994, he was one of the founders of I.NET, the first commercial ISP in Italy. He was one of the founding members of: CLUSIT, Italian association for IT security; AIPSI, Italian association of professionals of IT security (Italian division of ISSA.org). He has been a supporter of civic IT backing the first civic networks in Italy (e.g. RCM the civic network of Milan and ONDE - Online Desenzano). He is a supporter of network neutrality and knowledge sharing and he sustained since the beginning the activities of "Condividi la Conoscenza", the conferences organized by sen. Fiorello Cortiana and in 2005 he introduced in Italy the network neutrality topic in a congress with Lawrence Lessig and in other occasions. He is author of many books and papers on the Internet, published on the most important Italian newspapers. He chaired the Italian ISP association (AIIP) till January 2007. He has been awarded by "Corriere della Sera-Economia" as one of the 30 most innovative Italian entrepreneurs.

Bruce Sterling

Bruce Sterling, author, journalist, editor, and critic, was born in 1954. Best known for his ten science fiction novels, he also writes short stories, book reviews, design criticism, opinion columns, and introductions for books ranging from Ernst Juenger to Jules Verne. His nonfiction works include "The Hacker Crackdown: Law and Disorder on the Electronic Frontier" (1992), "Tomorrow Now: Envisioning the Next Fifty Years" (2003), and "Shaping Things" (2005). He is a contributing editor of WIRED magazine and writes a weblog. During 2005, he was the "Visionary in Residence" at Art Center College of Design in Pasadena. In 2008 he was the Guest Curator for the Share Festival of Digital Art and Culture in Torino, Italy, and the Visionary in Residence at the Sandberg Instituut in Amsterdam. In 2011 he returned to Art Center as "Visionary in Residence" to run a special project on Augmented Reality. He has appeared in ABC's Nightline, BBC's The Late Show, CBC's Morningside, on MTV and TechTV, and in Time, Newsweek, The Wall Street Journal, the New York Times, Fortune, Nature, I.D., Metropolis, Technology Review, Der Spiegel, La Stampa, La Repubblica, and many other venues

Sacha Wunsch-Vincent

Dr. Sacha Wunsch-Vincent is the Senior Economist at the World Intellectual Property Organization (WIPO) and Co-Editor of the Global Innovation Index. He joined WIPO in 2010 to help set up WIPO's economics work under the Chief Economist. At WIPO, he is one of the main authors of the World Intellectual Property Report and the Global Innovation Index. His primary research foci and current area of work are concerned with the interaction of innovation, intellectual property, and economic development. Before joining WIPO, he was an Economist at the OECD Directorate for Science, Technology, and Industry for seven years. Earlier he was the Swiss National Science Fellow at the Berkeley Center for Law and Technology (University of California, Berkeley) and the Peterson Institute for International Economics (Washington, D.C.). He has served as advisor to organizations such as the World Bank and the World Economic Forum, and has testified before governments and parliaments. His recent WIPO-CUP book on "Innovation in the Informal Economy of Developing Counties – Hidden Engine of Innovation?" was published by Cambridge University Press in December 2016. Sacha holds a Master of International Economics from the University of Maastricht with a Masters Thesis at MERIT and a PhD in Economics from the University of St. Gallen, Switzerland. He teaches International Economics at Sciences Po Paris, and the World Trade Institute in Bern.

1.3 Fellows

Antonio Casilli – Faculty Fellow

Antonio Casilli is associate professor at the Paris Institute of Technology (ParisTech) and research fellow at the School for Advanced Studies in Social Sciences (EHESS). His research foci are digital technologies and human rights: privacy, free speech, health, and workers' rights. He is the co-founder of the European Network on Digital Labour (ENDL). Among his most recent books: The 'Pro-Ana' Phenomemon [Le phénomène 'pro-ana'], Presses des Mines, 2016; What is digital labor? [Qu'est-ce que le digital labor?], INA Editions, 2015; Against the Hypothesis of the End of Privacy, Springer, 2014; Digital Relationships [Les liaisons numériques], Editions du Seuil, 2010. His work is regularly featured in international media (Le Monde, BBC, Repubblica, CNN, La Vanguardia, Hankyoreh Shinmun, Kathimerini).

Alessandro Cogo – Faculty Fellow

Alessandro Enrico Cogo (Ph.D., Pavia-Munich) is associate professor at the University of Turin Law Department. He lectures on IP, media and ICT law. He is also scientific director of the LLM in IP jointly offered by the University of Turin, WIPO and ITC-ILO. Author of a book on copyright contracts and of essays mainly on copyright and trademarks law, lately he has been dealing mostly with secondary liability issues, focusing in his later works on contributory infringement in patent law

Enrico Donaggio – Faculty Fellow

Enrico Donaggio teaches Philosophy of History at the Università di Torino; Figures du pouvoir and Écrire et penser at the Université Aix-Marseille. He is author of *Una sobria inquietudine. Karl Löwith e la filosofia* (Feltrinelli, 2004; translated in French and Spanish), *Che male c'è. Indifferenza e atrocità tra Auschwitz e i nostri giorni* (L'ancora del Mediterraneo, 2005), *A giusta distanza. Immaginare e ricordare la Shoah* (L'ancora del Mediterraneo, 2010), *Direi di no. Desideri di migliori libertà* (Feltrinelli, 2016). He has edited *La Scuola di Francoforte. La storia e i testi* (Einaudi, 2005), *Karl Marx. Capitalismo, istruzioni per l'uso* (Feltrinelli, 2007), *C'è ben altro. Criticare il capitalismo oggi* (Mimesis, 2014),), *K. Marx, Manoscritti economico-filosofici del 1844*, Feltrinelli 2018, *K. Marx - F. Engels, Manifesto del partito comunista*, Feltrinelli, 2017.

Massimo Durante – Faculty Fellow

Massimo Durante is Researcher in Philosophy of Law at the Department of Law of the University of Turin. He holds a Ph.D. in Philosophy of Law, Department of Law, University of Turin, and a Ph.D. in History of Philosophy, Faculty of Philosophy, University of Paris IV Sorbonne. He teaches courses in Legal Informatics and Philosophy of Law at the Department of Law, University of Turin. He is member of the Board of the International Erasmus Mundus Ph.D. Program "Law, Science, and Technology". His main fields of research concern the relation between Law and Ethics, Legal Informatics, Computer and Information Ethics. Author of several books, he has widely published articles, essays and book chapters in Italian, English and French. He is also member of editorial boards and peer-reviewer for several international reviews. He has been involved in many research projects in the fields of Philosophy of Law, Legal Informatics, and ICTs policies. He is also currently interested in Governance Theory and Digital Democracy.

Marco Torchiano – Faculty Fellow

Marco Torchiano is an associate professor at the Control and Computer Engineering Dept. of Polytechnic University of Turin, Italy; he has been post-doctoral research fellow at Norwegian University of Science and Technology (NTNU), Norway. He received an MSc and a Ph.D. in Computer Engineering from Polytechnic University of Turin. He is Senior Member of the IEEE and member of the software engineering committee of UNINFO (part of ISO/IEC JTC 1). He is author or co-author of over 130 research papers published in international journals and conferences, of the book 'Software Development—Case studies in Java' from Addison-Wesley, and co-editor of the book 'Developing Services for the Wireless Internet' from Springer. He recently was a visiting professor at Polytechnique Montréal on the software energy consumption topic. His current research interests are: green software, UI testing methodologies, open-data quality, and modeling notations. The methodological approach he adopts is that of empirical software engineering.

Davide Allavena – Fellow

Davide Allavena is a master student of Physics at Università di Pavia. He is completing his thesis about biologically detailed computational models of the cerebellar cortex. In April 2015 he started his work as IT Manager at Nexa Center. His main research interests focus on network measurements, network neutrality, and open data technologies. Davide regularly contributes into the software development projects of the Nexa Center

Mauro Alovisio – Fellow

Mauro Alovisio graduated in Law at the University of Turin, Italy. He has specialized in Data Protection and New Technologies Law. Currently he is working at the Legal Office of the University of Turin. During his professional activity he dealt with the privacy and the reorganization of the public administration through the use of the new technologies. Mauro is author of scientific articles published in Italian journals and co-author on law books. He is the President of "Centro Studi di Informatica Giuridica" and he is a member of the "Commissione Informatica del Consiglio dell'Ordine degli Avvocati di Torino". As part of his Nexa fellowship, Mauro will focus on research topics related to personal data in the EVPSI project and within the implementation of pilots in the Open-DAI project, also touching other issues related to public administrations in digital environment.

Claudio Artusio – Fellow

Claudio Artusio graduated in Law at the Univerisity of Turin in 2009. He collaborates with the Nexa Center since the spring of 2010 focusing on Public Sector Information (PSI) and open licenses. As Staff Research Fellow, from 2013 to 2015, he performed support and research in the field of open contents and open licenses: he provided front office assistance for Creative Commons Italia and was the operation manager of SeLiLi – the Free Licenses Service clinic. In addition, he followed the advancement of the LAPSI2.0 and PASTEUR4OA projects and managed the development of the research performed by the Nexa Center on the Legal Aspects of Service Robotics and on the exploitation of Open Data within the Italian Parliament. Previously, he managed the contents of the EVPSI Research Project and the LAPSI Thematic Network websites, both dedicated to PSI, and studied the potential connections between Trademarks (and related IP rights) and PSI within the EVPSI Project.

Eleonora Bassi – Fellow

Eleonora Bassi is a researcher and consultant with a legal and philosophical background. She graduated in Law and holds a Ph.D. in Philosophy of Law and Legal Theory (University of Torino). She worked at the Law School of the University of Torino (2008-2012) and at the Computer Science Department of the University of Trento (2012-2015). Her research fields are legal theory and political philosophy, privacy law, data governance, European IT policy, and legal theory.

Lorenzo Benussi – Founding Fellow

Lorenzo Benussi, master's degree in Communication Sciences and Ph.D. in Economics of Innovation, is advisor for digital policy at the TOP-IX Consortium where he develops projects and policies to support digital innovation. He was counsellor of the Italian Minister of Education and Research and member of task forces to promote online engagement and e-participation at the Ministry of Reforms and the Ministry of Foreign Affairs. Lorenzo is also member of the scientific board of Opencoesione, open data project of the Ministry of Treasury, and member of the board for innovation of the IREN Group. Lorenzo is fellow of the Nexa Center for Internet & Society at the Polytechnic of Turin where he conducts researches on the economics of innovation, strategic management and economics of knowledge. Lorenzo main interest both as professional and researcher is the evolution of innovation models due to the pervasive diffusion of digital networks.

Enrico Bertacchini – Founding Fellow

Dr. Enrico Bertacchini is assistant professor at the Department of Economics and Statistics "S. Cognetti De Martiis", University of Turin, where he teaches Cultural Economics and Governance of Economic Processes. He graduated in Economics at the University of Turin and holds a Master in Economics from CORIPE–Collegio Carlo Alberto and a Ph.D. in Institutions, Economics and Law from the Universities of Turin and Gent. His main interests within the "Internet & Society" field concern Internet as an infrastructure for the production of and access to information goods and the economic analysis of the information society. He has multidisciplinary competences concerning the economics of culture and the economic analysis of intellectual property, with a particular focus on commons-based models for the production of and access to information goods. His works has been published, among others, in the Journal of Cultural Economics, International Journal of Cultural Policy, International Journal of Arts Management, Review of Law and Economics, Ecological Economics and Regional Studies.

Marco Ciurcina – Founding Fellow

Italian lawyer, working in the field of commercial and contractual law, Information Technology law, Copyright, Patent, Trademark, and Privacy law, particularly, with special focus on free software licenses, open content and open data. He teaches "Law and ethics of communication" at the Polytechnic University of Turin. Free software and digital fundamental rights activist.

Carlo Blengino – Fellow

Carlo Blengino lives in Turin and is a lawyer and a partner of the legal firm "Studio Legale Catalano Penalisti Associati". Carlo deals exclusively with criminal law cases, with special reference to professional liabilities, economics criminal laws, intellectual property rights, ICT law, privacy and data protection. Since the early '90s he faced before the Courts main legal issues related to copyright, cybercrime, and ISP liability: among his many defenses, the one in the well-known sentence on downloading (Cass.149/07), the defense of many users in the Peppermint case, and on behalf of Google Inc., he was the defense lawyer of the Google Global Privacy Counsel in the Google vs. Vividown leading case. He is fellow of NEXA Center for Internet & Society at the Polytechnic University of Turin. He writes for some on-line journals and for scientific magazines and He has published contributions for several publishers: Giappichelli, UTET Giurdica, Egea ed Aracne. He has a personal blog on IlPost.it.

Nicola Bottero – Founding Fellow

Nicola Bottero is a practicing lawyer with a degree in Law from the University of Turin with a thesis on comparative law. He also graduated in the Intellectual property Specialization Course jointly organized by the University of Turin and the WIPO Academy. On top of practicing private law, industrial law and commercial law, works with the Chairs of Commercial and Industrial Law at the Law Faculty of the Universities of Turin. He also teaches industrial law within some master degrees. He has been a member of the working group of Creative Commons Italy since its beginnings in 2003.

Lorenzo Canova – Fellow

Lorenzo is Junior Product Manager at Prima Industrie S.p.a. for digital innovative products (Augmented reality, digital Twin and IIOT) while attending a 2 year Specialising Master in Manufacturing 4.0 at Politecnico di Torino. He is adjunct professor of the "Digital Revolution" course (Rivoluzione Digitale) held by prof. De Martin at Politecnico di Torino since 2015 (rivoluzionedigitale.polito.it/). Between 2014 and January 2017, he has been research fellow and subsequently managing director of the Nexa Center for Internet & Society. For one year he has been managing coordinator of the Global Network of Internet & Society Research Centers.

Fabio Chiusi – Fellow

Fabio Chiusi is a freelance journalist (Wired, L'Espresso, Repubblica) and blogger (ilNichilista, Chiusi nella rete) who regularly writes about Internet censorship, surveillance and the complex relationship between digital technologies, politics and society. He holds a MSc in Philosophy of Science from the London School of Economics. He is the author of *Critica della democrazia digitale. La politica 2.0 alla prova dei fatti* (Codice Edizioni).

Deborah De Angelis – Founding Fellow

Lawyer expert in copyright, entertainment and new technologies law. Admitted to practice law in Italy before the Supreme Court. In 2001, she founded the DDA law firm (http://www.ddastudiolegale.it/). On January 23, 2019, she was assigned as legal advisor of the Minister of Cultural Heritage for Copyright Law (Ministerial Decree of 23.01.2019, No. 17), renewed with Ministerial Decree 17.07.2019, n. 320, until the Minister remained in charge. In May 2016, she obtained the certificate of completion for the "CopyrightX - Harvard course on International Copyright Law". On November 20, 2015 she received the recognition of the title of expert in the field of copyright and entertainment law from the Bar Association of Rome.

In 2013 she was the correspondent for Italy of the Institute for Information Law of the University of Amsterdam (Ivir) and of the European Economics for the study EU MARKT/2013/080/D on remuneration for authors and artists and for the study EU MARKT / 2014/088/D on remuneration for the authors of scientific books and journals and visual arts for the use of their products. She carries out teaching and training activities and she organizes numerous conferences on the subject of digital copyright and entertainment law. Since 2010 she has been scientific coordinator and lecturer of the Altalex Master in Entertainment Law. She also is the coordinator and lecturer of the Lexenia Advanced Courses on Music Law, on the protection of the work of art, the procedural protection of intellectual property and digital copyright. She also had lecturer at Luiss and La Sapienza University, Luiss, University of Trento. She is authored several publications and articles. Since 2008 she is President of the A-DJ, representative trade association of the professional figure of the DJ, signatory of the Convention on the online DJ license issued by SIAE (http://www.a-dj.org/). Since 2008, she has been fellow of NEXA - Center for the Internet & Society (www.nexa.polito.org), research center of the Department of Automation and Computer Science of the Polytechnic of Turin. Since 2004 she has been a member of the Creative Commons IT legal study group, representing which she coordinated the CC-it / SIAE Joint Legal Working Group. On 6 December 2018, after the creation of the Italian Chapter of the new Creative Commons Global Network, she was elected Representative for the Creative Commons Global Network Council and Chapter Lead.

Giulio De Petra – Fellow

Giulio De Petra received his degree in Economics from University of Siena, Italy. He worked in the service organization in BNL (Banca Nazionale del Lavoro), one of the top italian banks, as expert in software design methodologies and in database administration. Later, he moved to the consulting division of IPACRI (Istituto per l'Automazione della Casse di Risparmio Italiane), where he was in charge of the research activities and projects. It has been senior consultant for the RSO Institute and it was for several years ICT advisor for the major of the city of Rome. Later, he became executive manager in AIPA (Autorità per l'Informatica nella Pubblica Amministrazione) - public local administration division. After he became director general for eGovernment at the Prime Minister's department of Public Administration where he promoted the first national plan for eGovernment. Afterwards he became general manager in CNIPA (Centro Nazionale per l'Innovazione della Pubblica Amministrazione) leading as a director the public local administration department. Giulio De Petra then became general executive manager for Innovation before for the Autonomous Region of Sardinia and later for the Calabria Region. It has been member of the Prime Minister's Committee for the Statistical Information Assurance and he was vice president of ASSINTER (National association of the regional public administration companies working in the ICT field). Since 2010 he has been working at Informatica Trentina, as executive manager. Giulio De Petra founded and supported many national associations working on political and social issues of technological innovation, including "ICT for Democracy","Network","The NetCentury – for a Free Knowledge Society".

Antonio Langiu – Fellow

Antonio Langiu is a student of computer engineering at the Politecnico di Torino. He got in touch with the Nexa Center attending the Rivoluzione Digitale course. In November 2014 he started an internship at the Nexa Center to study the permission models used by applications available via app stores. He also studied how the advertising network libraries, included in mobile applications, use (or abuse) permissions to collect user's data. Actually he is participating in the Neubot project and in the development of the MeasurementKit library..

Stefano Leucci – Fellow

Stefano Leucci works in the field of data protection. He combines a legal background with IT skills for assessing and solving data protection issues, bridging the gap between legal teams and ICT departments. He has a wide range of experience in strategic advising for improving organizational efficiency and reducing risks of data breaches through gap analysis and digital forensics techniques. His main research interests are privacy-by-design methodologies and privacy enhancing technologies. @stefanoleucci

Alessio Melandri – Fellow

Alessio Melandri is full stack developer at Synapta in Turin (https://synapta.it/) , company specialized in the semantic Web and data driven applications. Having graduated in software engineering at Politecnico di Torino he has experience as programmer, in particular he works with data, refining, quering, providing visualizations and evaluating its quality. He joined the Nexa Center in 2014 after the course Rivoluzione Digitale (http://rivoluzionedigitale.polito.it/) held by Professor Juan Carlos De Martin. During 2014-2015 he collaborated with Nexa as intern, developing software, contributing to TellMeFirst (http://tellmefirst.polito.it/) and linked data projects. He has also experience in the open data field collaborating to Wikipedia, Wikidata and OpenStreetMap.

Lara Merla – Fellow

Lara Merla is currently a Ph.D. candidate in Law and Institutions at the University of Turin. Lara earned her Degree in Law from the University of Turin in 2015 and her LLM in Comparative Law, Economics and Finance from the International University College in 2017. Since law school, she has been interested in issues of technological transformations and the law. Accordingly, both her basic degree and her master thesis were on big data and privacy. She has lectured on law and technology in a variety of continuing education programs. She is also engaged in part-time legal practice in the area of digital crimes. Her publication record includes the article "Droni, privacy e tutela dei dati personali" published by Informatica e Diritto, Redazione Ittig in 2016. She is also a peer reviewer for the international review Global Jurist. Since 2014 she regularly attended seminars and lectures at the Nexa Center for Internet & Society

Federico Morando – Fellow

Federico is an economist, with interdisciplinary research interests focused on the intersection between law, economics and technology. His research activity mainly concerns models of production and sharing of digital contents, with a focus on linked (open) data. He also taught intellectual property and competition law at Bocconi University in Milan, and he lectures at the Politecnico di Torino and at the WIPO LL.M. in Intellectual Property. He has an undergraduate degree in Economics from Bocconi Univ. and a master's degree in Economic theory and econometrics from the Univ. of Toulouse. He holds a Ph.D. in Institutions, Economics and Law from the Univ. of Turin and Ghent with a dissertation about software interoperability. Federico joined the working group of the Nexa Center in 2006 at the beginning of its first year of formal activity. From Dec. 2012, he leads the Creative Commons Italy project and he is a member of the Open Team of Regione Piemonte that launched and steers the development of the first Italian open government data portal. From 2008 to 2012, in his position as the first Managing Director of the Center, he worked closely with the Directors to define staff and project goals and to coordinate the Center's fellows. From 2013 to 2015 he served as Director of Research and Policy of the Nexa Center, focusing on the coordination of the cross-disciplinary research activities of the Center and on the related policy support actions. At the end of 2015 Federico left the staff of the Center to become a co-founder and the CEO of Synapta, an innovative start-up specializing in linked data and the first spin-off of the Nexa Center. He continues to serve as a fellow of the Center and as the public lead of CC Italia.

Fabio Nascimbeni – Fellow

Fabio Nascimbeni, an economist with a PhD on Information and Knowledge Society, works as Assistant Professor in the Universidad Internacional de La Rioja (UNIR) in Spain, is a fellow at the Centro de Estudos sobre Tecnologia e Sociedade of the University of Sao Paulo (USP) in Brazil and a Senior Fellow of the European Distance and eLearning Network (EDEN). He has been active in the field of learning innovation and ICT for learning since 1998, working across Europe as well as in Latin America, the Caribbean, the South Mediterranean and South-East Asia. His main research interests are open education, learning innovation, digital literacy, social networking.

Monica A. Senor – Fellow

Former criminal lawyer specializing in privacy, data protection, ICT law and digital forensics, Monica A. Senor has been a member of the staff of the Italian Supervisory Authority (Garante per la protezione dei dati personali) since December 2018. She is fellow of the Nexa Center for Internet & Society at the Politecnico di Torino (DAUIN), an indipendent research center focusing on interdisciplinary analysis of the force of the Internet and of its impact on society. She is the author or co-author of many publications, including online reviews (Medialaws.eu, ictsecuritymagazine.com, AgendaDigitale.eu), scientific journals and law textbooks (edited by Egea, Giappichelli, Springer, UTET Giuridica and Aracne publishing houses).

Massimo Travostino – Founding Fellow

Massimo Travostino graduated in law from University of Turin (1993) and has a post-graduate degree in international and comparative law (1996). He is a practicing lawyer at Studio Legale Pecoraro–Travostino and assists public entities and private companies in commercial and contract law, with a focus on intellectual property/information technology and telecommunication sectors. He carries out regular teaching activity and is author of articles and essays.

Giuseppe Vaciago – Fellow

Giuseppe Vaciago has been a lawyer of the Milan Bar since 2002 and he is actually a partner of R&P Legal Firm. For the last 10 years his primary focus has been IT Law with a focus on cyber crime. He has assisted many national and international IT companies. Academically, he received his Ph.D. on Digital Forensics from Università di Milano and he is a Professor at Insubria University (Varese and Como) where he holds a course on IT law. He recently attended Fordham Law School and Stanford Law School as a Visiting Scholar to expand his studies in his own particular research area. Giuseppe Vaciago is the author of many publications on cybercrime, including both scientific journals and text-books, which have been adopted by the University where he teaches. He has also delivered many lectures and presentations in both Italy and abroad. He is fellow at the Cybercrime Institute of Koln and member of the Editorial Board of Journal of Digital Investigation. As part of his Nexa fellowship, Giuseppe will propose research topics related to digital forensics and fundamental rights from an "Internet & Society" perspective and big data and social control.

1.4 Faculty Associates

Simone Arcagni – Faculty Associate

Simone Arcagni è professore all'Università di Palermo e insegna allo IULM di Milano e alla Scuola Holden di Torino. Studioso, consulente, curatore e divulgatore di nuovi media e nuove tecnologie. Collabora con «Nòva-Il Sole24Ore», «FilmTV», «Segnocinema», «Che Fare», «Impactscool Magazine» e altre riviste e giornali. Tiene una rubrica per l'inserto «Scienze» di «Repubblica» e un blog sul sito «Nòva100». Ha fondato e dirige la rivista scientifica «ESJournal» e cura "VR Stories", festival e mercato internazionale di realtà virtuale. Recentemente in qualità di curatore ha firmato la mostra Futuri passati (Biennale Democrazia/Polo del '900) e #FacceEmozioni (con Donata Pesenti Campagnoni per il Museo Nazionale del Cinema). Tra le sue pubblicazioni, Oltre il cinema (2010) e Screen City (2012). Per Einaudi ha pubblicato: Visioni digitali (2016) e L'Occhio della macchina (2018).

Giancarlo Frosio – Faculty Associate

Giancarlo Frosio is an Associate Professor at the Centre for International Intellectual Property Studies (CEIPI), University of Strasbourg. He is a qualified attorney with a doctoral degree (S.J.D.) in IP law from Duke Law School. Additionally, he holds an LL.M. from Duke Law School, an LL.M. in IT and Telecoms law from Strathclyde University, and a law degree from Università Cattolica of Milan.

Giancarlo is also a Non-Residential Fellow at the Center for Internet and Society at Stanford Law School. Previously—from 2013 to 2016—he was the Intermediary Liability fellow with Stanford CIS. At Stanford CIS, Giancarlo launched the Intermediary liability research focus area of the Center, the World Intermediary Liability Map (WILMap), and the Stanford Intermediary Liability Lab (SILLab). Since 2013, Giancarlo also serves as affiliate faculty at the Harvard CopyrightX program, where he lectures and coordinates the Turin University Affiliated Course, whose first edition he personally launched. He is a Lecturer of the LL.M. in Intellectual Property law jointly organized by WIPO and the University of Turin, where he also served as the Deputy Director and Lecturer from 2010 to 2013. He is a Faculty Associate of the NEXA Research Center for Internet and Society in Turin. Previously, Giancarlo served as a post-doctoral researcher at KU Leuven Center for IT & IP (CiTiP), COMMUNIA Fellow at the NEXA Center and CREATe Fellow at the University of Nottingham. As a COMMUNIA and CREATe fellow, Giancarlo drafted extensive reports on the digital public domain and open access publishing respectively. As an attorney, Giancarlo worked with the Intellectual Property & Technology Group of a prominent international law firm. Giancarlo dedicated most of his academic career to studying the interface between technology, innovation, creativity, and intellectual property through the lens of international, European and American law. His research focuses on copyright law, digitization, history of creativity, public domain, open access, Internet and user based creativity, intermediary liability of online service providers, data protection, network information economy, access to knowledge (A2K), and identity politics. Giancarlo is the author of numerous legal articles and publications. His last book "Reconciling Copyright with Cumulative Creativity: the Third Paradigm" (Edward Elgar 2018) builds on interdisciplinary research exploring the communal and collaborative nature of creativity from a historical perspective to make predictions about creativity's future policies. He is also the editor of the forthcoming collection titled "The Oxford Handbook of Intermediary Liability Online" from Oxford U Press.

Daniele Trinchero – Faculty Associate

Daniele Trinchero is professor at Politecnico di Torino (Dept. of Electronics and Telecommunications), where he manages the iXem Labs (which he co-founded with Riccardo Stefanelli in 2004). His research interests encompass Wireless Networks, Sensor Networks, Internet of Things, and solutions to reduce digital divide in developing countries, and in marginal areas of developed ones. He is member of the Institute of Electrical and Electronics Engineers (IEEE).

Giorgio Ventre – Faculty Associate

Giorgio Ventre is Professor of Computer Networks in the Department of Electrical and Information Engineering of the University of Napoli Federico II where he is leader of the COMICS research group on computer networking and multimedia communications. He owns a laurea degree in Electronic Engineering and a Ph.D. in Computer Engineering, both from the Federico II. From 1991 to 1993 he was with the Tenet Group at the International Computer Science Institute and the University of California at Berkeley. In 1993 he joined the University of Napoli Federico II first as an assistant professor. In 1999 Giorgio Ventre was co-founder of ITEM, the first national research laboratory of the Italian University Consortium for Informatics (CINI), and from 2004 to 2011 was President of CRIAI, an industrial research center on ICT in Napoli. He is now Director of ITEM and member of the board of CINI. He has been principal investigator for a number of national and international research projects and in four EU-funded research projects on the Future Internet. Giorgio Ventre has co-authored more than 200 publications and he is senior member of the IEEE and of the ACM, and he is member of AICA and of IET. He is area editor for the Computer Networks journal, Elsevier. His researches are sponsored by the European Commission, the Italian Government and by several national and international companies. He has also launched four start-up companies from the research activities developed in his lab.

1.5 Alumni

Federica Giordano – Intern 2019
Marc Perrin – Intern 2018-2019
Francesco Mecca – Intern 2018-2019
Enrico Gobbo – Intern 2018-2019
Beatrice Bolzonella – Intern 2018-2019
Claudia Guccione – Intern 2018
Simone Basso – Senior Research Fellow 2015-2019
Pasquale Pellegrino - Research Fellow 2017-2019
Urs Gasser - Trustee 2012-2019
Stefano Rodotà - Trustee 2009-2017
Giovanni Arata - Fellow until 2018
Elena Pavan - Fellow until 2018
Andrea Cairola - Faculty Associate 2014-2018
Thomas Margoni - Faculty Associate 2008-2018
Emanuele Mottola - Intern 2018
Carlo Barone - Intern 2018
Leonardo Vezzani - Intern 2018
Luciano Floridi - Trustee 2013-2018
Simone Montrucchio - Intern 2018
Davide Brunello - Intern 2017
Elisa Botto - Intern 2017-2018
Marco Abrate - Intern 2017
Diego Mariani - Staff Research Fellow 2017-18
Alessandro Mantelero – Faculty Fellow 2011 - 2017
Marco Berlot – Intern 2017
Carolina Nicosia – Intern 2017
Carmine D'Amico – Intern 2016
Cristina Sappa - Fellow 2011-2016
Federico Cairo – Fellow 2012-2016
Myriam Bianco – Staff Research Fellow 2015-2016
Nicola Rustignoli – Intern 2015
Dario Chaifouroosh – Intern 2015
Alessandro Quaranta – Intern 2015
Luca Leschiutta – Staff 2007-2015
Roberta Bruno – Intern 2015
Fiorenza Oppici – Intern 2013
Alberto Sega – Staff 2013
Nadia Tecco – Staff 2012-2013
Silvia Bisi – Fellow 2010-2012
Elias Carotti – Research Fellow 2009 – 2012
Irene Cassarino – Fellow 2009-2012
Davide Bardone – Research Fellow 2009-2011
Carolina di Vonzo – Fellow 2009-2011
Corrado Druetta – Research Fellow 2009-2011
Valentin Vitkov – Fellow 2009-2011
Maria Crea – Staff 2011
Federica Cedriano – Staff 2009-2011
Antonella Giulia Pizzaleo – Research Fellow 2009-2010
Ilaria Buri – Staff 2009-2010
Anna Piccitto – Staff 2009-2010
Maria Teresa Medina Quintana – Staff 2006-2008
Andrea Glorioso – Staff 2006-2007

1.6 Staff

Antonio Santangelo – Executive Director

See dedicated box at page 3 of the EXECUTIVE SUMMARY.

Mattia Plazio – Managing Director

See dedicated box at page 3 of the EXECUTIVE SUMMARY.

Selina Fenoglietto – Administrative Manager

See dedicated box at page 3 of the EXECUTIVE SUMMARY.

Francesco Ruggiero – Communication Manager (until September 2019)

See dedicated box at page 3 of the EXECUTIVE SUMMARY.

Anita Botta – Communication Manager (from October 2019)

See dedicated box at page 3 of the EXECUTIVE SUMMARY.

Giovanni Garifo – IT Manager

See dedicated box at page 3 of the EXECUTIVE SUMMARY.

Antonio Vetrò – Senior Research Fellow

See dedicated box at page 3 of the EXECUTIVE SUMMARY.

Eleonora Bassi – Senior Research Fellow

See dedicated box at page 3 of the EXECUTIVE SUMMARY.

Marco Conoscenti – Ph.D. Student

See dedicated box at page 3 of the EXECUTIVE SUMMARY.

Giuseppe Futia – Ph.D. Student

See dedicated box at page 3 of the EXECUTIVE SUMMARY.

Elena Beretta – Ph.D. Student

See dedicated box at page 3 of the EXECUTIVE SUMMARY.

Giacomo Conti – Junior Researcher (from December 2019)

See dedicated box at page 3 of the EXECUTIVE SUMMARY.

1.7 Interns

Irene Domenicale - Intern

Irene Domenicale graduated in 2019 from the University of Turin with a master's degree in Philosophical Sciences. For the Nexa Center she worked on the organization and management of the PoliTo pilot training course foreseen by the Edu-Hack project.

Nicolas D'Amanzio - Intern

Nicolas D'Amanzio is a student from the University of Turin (DAMS). He studies cinema and his interest is to work in the film industry. During his studies, he started making some interviews and shorts films for several local Film Festivals. He worked for the Nexa Center realizing video and interviews in the context of "Nexa City" project.

Viola Inui Biffi - Intern

Viola Inui Biffi is a student from the University of Turin. She attends the DAMS course (Art Music and Enter-tainment Disciplines). She is passionated about photography, cinema, music, video making, videoclips, elec-tronic music, visual arts. She worked for the Nexa Center realizing video and interviews in the context of "Nexa City" project.

Cosma Alex Vergari - Intern

My goal is to understand the deepest relations underlying everyone's ideals and safeguard them in the ever-evolving Internet era. It is a matter of social justice and I think that we have the responsability of keeping the web the democratic place that it is intended to be. I am involved in Nexa Center's project "Geranium" as well as in a research project on the extraction of meaningful semantic relations among semantic types exploiting Linked Data knowledge.

Flavio Emanuele Cannavò - Intern

Flavio Cannavò recently got a master's degree in Computer Engineering at Politecnico di Torino with a thesis developed in collaboration with NEXA Center. His thesis is about Fairness and Distributive justice criteria ap-plied to machine learning algorithms. Flavio is a technology enthusiast and during academic years worked in many projects as Web developer and data scientist

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Annex II – Nexa Publications

Annex II – Nexa Publications

This section includes published articles, but also other products of the research by the Nexa Staff and Nexa Fellows, encompassing reports and some selected blogposts and presentations. Please, notice that the list of the Nexa Fellows publications just includes the set of contributions signaled by the Nexa Fellows themselves. All Nexa Staff members and Fellows are listed in bold type.

Publications by Nexa Staff

Peer Reviewed Articles in Journals and Magazines

E. Bassi, *European Drone Regulation: Today's Legal Challenges*, 2019, in "Proceedings of the 2019 International Conference on Unmanned Aircraft Systems (ICUAS)", pp. 435-442, disponibile su https://ieeexplore.ieee.org;

E. Bassi, *From here to 2023: Civil Drones Operations and the Setting of New Legal Rules for the European Single Sky***,** in "Journal of Intelligent and Robotic Systems", Springer, 2020 (1), pp. 1-20 (forthcoming).

E. Bassi; N. Bloise; J. Dirutigliano; G. Fici; S. Primatesta; U. Pagallo; F. Quagliotti**,** *The Design of GDPR-abiding Drones through Flight Operation Maps: A Win-Win Approach to Data Protection***,** Aerospace Engineering, and Risk Management, in "Minds and Machines", Springer, 2019, https://doi.org/10.1007/s11023-019-09511-9.

E. Bassi, *Urban Unmanned Aerial Systems Operations: On Privacy, Data Protection, and Surveillance*, in "Law in Context" 2020 (37), pp. 1-22.

M. Trevisan, S. Traverso, **E. Bassi**, M. Mellia, *4 Years of EU Cookie Law: Results and LessoEU Cookie*, in "Proceedings in Privacy Enhancing Technologies", 2019 (2), pp. 126-145.

M.Conoscenti, V. Besner, A, Vetrò, D. Méndez Fernández**,** *Combining Data Analytics and Developers Feedback for Identifying Reasons of Inaccurate Estimations in Agile Software Development*, Journal of Systems and Software, 19 June 2019.

E. Beretta, A. Santangelo, A. Vetrò, B. Lepri, **J.C. De Martin**. (2019), *The Invisible Power of Fairness. How Machine Learning Shapes Democracy*. In: Meurs MJ., Rudzicz F. (eds) Advances in Artificial Intelligence. Canadian AI 2019. Lecture Notes in Computer Science, vol 11489. Springer, Cham. https://doi.org/10.1007/978-3-030-18305-9_19

G. Futia, A. Vetrò, *On the Integration of Knowledge Graphs into Deep Learning Models for a More Comprehensible AI—Three Challenges for Future Research*, INFORMATION, MDPI - Information, pp. 10, 2020, Vol. 11, ISSN: 2078-2489, DOI: 10.3390/info11020122

S. Wagner, D.M. Fernández; M. Felderer; **A. Vetrò**; M. Kalinowski; R. Wieringa; D. Pfahl; T. Conte; M.T Christiansson; D. Greer; C. Lassenius; T. Männistö; M. Nayebi; M. Oivo; B. Penzenstadler; R. Prikladnick; G, Ruhe; A. Schekelmann; S. Sen; R. Spínola; A. Tuzcu; J.L. De La Vara; D. Winkler, *Status quo in requirements engineering: A theory and a global family of surveys*, ACM TRANSACTIONS ON SOFTWARE ENGINEERING AND METHODOLOGY, Association for Computing Machinery, pp. 48, 2019, Vol. 28, ISSN: 1049-331X, DOI: 10.1145/3306607

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