



Nexa Center for Internet & Society
Politecnico di Torino

Annual Report 2021

Studying the Internet, exploring its potential & experimenting new ideas



Nexa Center

for Internet & Society

Nexa Center for Internet & Society

Via Pier Carlo Boggio 65/A, 10138 Torino, Italy

(to reach us, see: <https://nexa.polito.it/contacts-en>)

+39 011 090 7217 (Phone)

+39 011 090 7216 (Fax)

info@nexa.polito.it

Mailing address:

Politecnico di Torino – DAUIN

Corso Duca degli Abruzzi, 24

10129 TORINO

ITALY

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 Giacomo Conti, Anita Botta and Giovanni Garifo, with the contributions from the Nexa Staff, Directors and Community.



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FOREWORD

As it is the case for all of society, this past academic year was marked by the global pandemic. Inevitably, life at the Nexa Center changed as well. Researchers and fellows were forced to work from home; professors had to teach remotely. While we certainly lost the important element of physical sociality, which had characterized the Nexa Center since its foundation in 2006, the year 2020 also brought new opportunities for research. The use of the Internet and of its tools became necessary for many activities: the increasing reliance on information technology and modern software, together with the use of artificial intelligence and pervasive data collection techniques, exacerbated by the unique situation caused by Covid-19, accelerated and exposed in plain view many topics that were often already at the forefront of the Nexa Center's interests. Just to make one example, our activities regarding the study of the impact of A.I. on society turned out to be even more important and necessary than previously thought.

Let us begin with a special mention regarding Giuseppe Futia and Elena Beretta, who successfully discussed their PhD theses, respectively on the automatic knowledge graphs generation and on algorithms for social goods: congratulations to both of them! Then, it is perhaps worth mentioning that one of us, JC De Martin, had a role in strengthening the curricula of students at Politecnico di Torino through the creation of the new Politecnico course titled "Grandi Sfide Globali" ("*Major Global Challenges*", an interdisciplinary course on six major challenges facing humanity). JC also designed "Tempi Difficili" ("*Hard Times*", quoting Charles Dickens), a series of 11 public lectures on the ongoing pandemic with experts from different disciplines. The latter initiative has been organized as a follow-up activity of Biennale Tecnologia, which was curated by Prof. Juan Carlos De Martin and by the Nexa Trustee Luca De Biase as a periodic evolution of the previously organized Festival della Tecnologia: from 12 to 15 November 2020, more than 140 events were organized, with the participation of about 300 speakers and more than 20.000 people following it online (and many more afterwards, by watching the recordings). The next edition will be in November 2022. At long last, another one of us, Marco Ricolfi, has been asked to organize and direct the implementation of the European Digital Single Market Directive in his capacity as President of the Comitato Consultivo permanente per il Diritto d'Autore which advises the Italian Government in Copyright matters.

Many other teaching activities, University courses and seminars have been carried out by the Nexa Center, with an intense interaction between the humanities and social sciences with the engineering disciplines, to better face the issues that technology and its use pose on individuals and collectives. The Nexa Center also continued to participate in three institutional networks: the Global Network of Internet & Society Research Centers, CINI - Laboratory for Informatics and Society and "Scienza Nuova", a center devoted to studying the digital revolution interdisciplinary co-founded by the Politecnico di Torino and the University of Torino.

In 2020 saw our Center was awarded two EU-funded projects: "StrategyHack", which is meant to be the follow up to the well-received EDUHack project that the Nexa Center coordinated between 2018 and 2020, and "CLIKC", an ERASMUS+ project that aims at the development of a new adaptive learning platform. StrategyHack is meant to produce a series of courses for mid-level institutional leaders aiming at leveraging the opportunities offered by the digital revolution in their areas of competence. CLIKC, instead, has as main objective the development of a new learning system based on an online recommendation system - of which Nexa is in charge - empowered by semantic web and by machine learning technologies. With the participation to these two research projects, the Nexa Center continues its commitment to research and develop new learning tools.

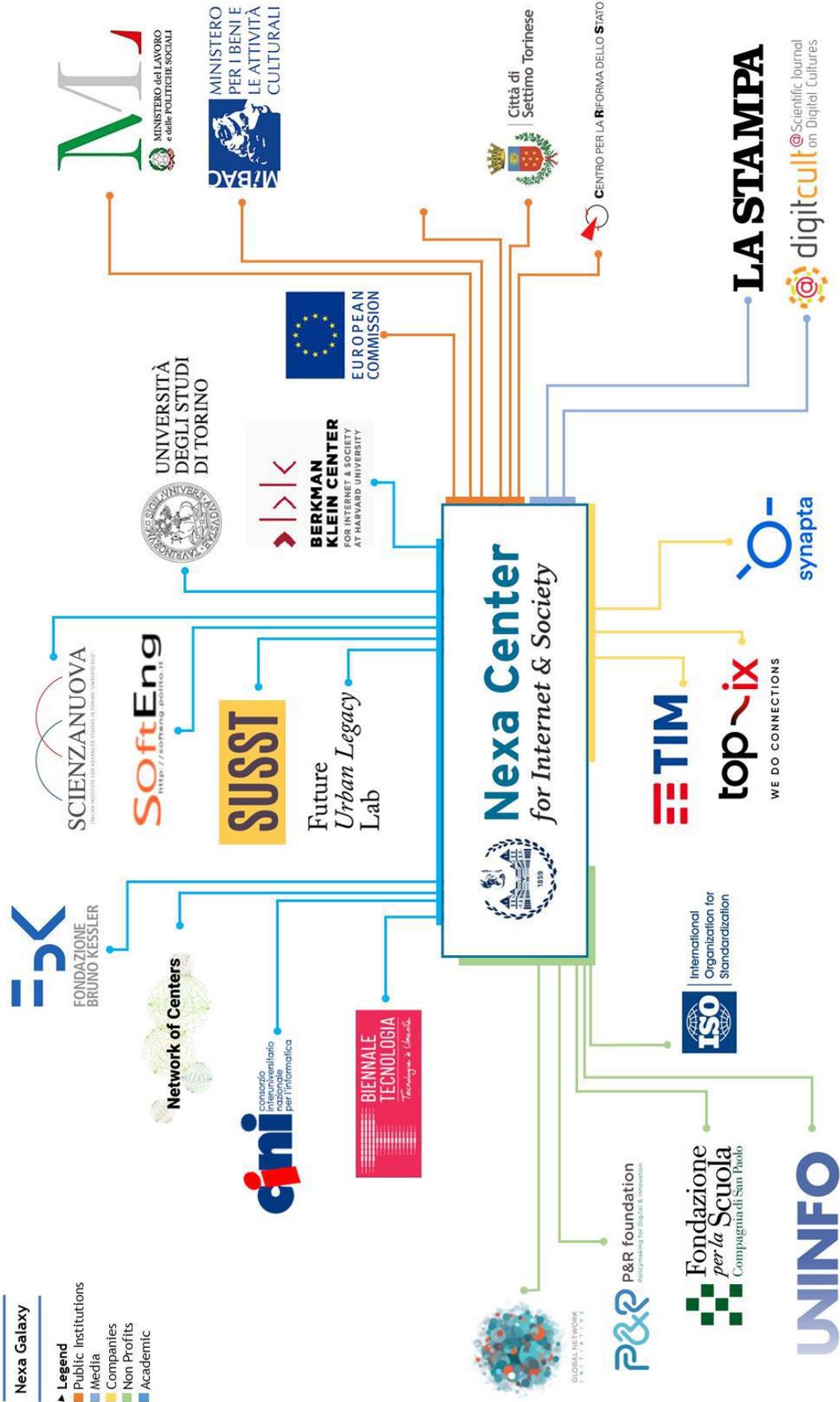
In the reporting period, the Nexa Center renewed its research collaboration with TIM, the main Italian Telecommunications company. Our cooperation with TIM resulted in two documents on the blockchain, its problems and its possible fixes, and its alternatives. The blockchain, and Bitcoin in particular, was also the main topic of the Payment Channel Networks for Blockchain Scalability project, which challenged the limitations of Bitcoin's payment channel network, proposing a testing environment through the CLoTH simulator, developed by Marco Conoscenti.

An unusual but nonetheless stimulating Annual Conference was organized, remotely and for two days, in December 2020, titled "Speakable and unspeakable: who decides in the age of digital communication?", during which several experts discussed topics related to fake news, hate speech, political correctness.

Due to the Covid-19 global emergency, there were no in person events this year but we are still proud to have successfully organized EduHack's Online Workshop *EduHackaton* on the 7th of July 2020 and all our usual public seminars (overall more than 30).

In spite of all the hardships that this year has brought on us, or possibly because of them, we certainly carry with us a renewed awareness of the importance of real, face-to-face social interactions. On the other hand, we have further understood how deeply digital tools affect the life of all of us every day and, even more so during exceptional times like these, as it was necessary to use them constantly in our private lives as well as in the workplace. We will resort to this increased practical experience and on the reflections and studies reported herein to renew our efforts in protecting individual and collective rights in cyberspace, hence preserving also freedom in our physical life and in our democratic societies.

Juan Carlos De Martin and Marco Ricolfi – Faculty Directors



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 2020-2021 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 2020-2021 Timeline", which reports the most relevant events of the last 12 months for our Center's life.

The activities of the Nexa Center over the period July 2020-May 2021 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" (see p. 9) 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 fairness in machine learning, in semantic modeling through deep learning and on the building of knowledge graphs, and on automated decision-making systems and their use.

For what concerns data and algorithms ethics, our project regarding the debate on fairness in machine learning continued, 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. 10). Two new papers were published: the first, a conference proceeding, focused on detecting discriminatory risks through data annotation, and the other regarding equality of opportunity in ranking models.

A research on semantic modeling through deep learning (see p. 11) was carried on and concluded in September with a Ph.D. thesis from Giuseppe Futia, "Neural Networks for Building Semantic Models and Knowledge Graphs". In general, the research tried to reconstruct the semantics of semi-structured sources of data, to automatically build and complete knowledge graphs. This year, two new journal papers were published, focused on the integration of knowledge graphs in deep learning models.

The work with Softeng research group, started in 2019 and due to end in 2022, on the topic of Data Bias, continued with the final goal to ensure a more conscious and responsible use of automatic decision-making (ADM) systems. This year, this resulted in a study which was accepted for publication at the EGOV-CeDEM-ePart 2020 conference and has been selected as the "most innovative research contribution or case study" (see p. 12).

TECHNOLOGY AND SOCIETY

As in the last years, the relationship between "Technology and society" was a very important topic in 2020-2021. Born last year as a permanent evolution of the Festival della Tecnologia, Biennale Tecnologia (p. 15) has been a series of wide-ranging national and international appointments aimed at proposing a broad reflection on the relationship between technology and society. More than 20.000 people participated at the events. Biennale Tecnologia will alternate with another very important Festival in town: Biennale Democrazia.

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 also used to describe SUSST (Scienze Umane e Sociali per le Scienze e la Tecnologia, see p. 16), 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. Among this project, a new university course was launched this year, "Grandi Sfide".

The technology of the Blockchain was also the focus of another project, Distributed architectures for private and efficient data management (p. 17), which took into account the impossibility to modify the data contained in blockchains, and the absence of a centralized figure to be held accountable, to show its incompatibilities with the current European legislation regarding privacy. Solutions and alternatives were proposed inside the two documents that were published, and a workshop was organised with TIM to showcase and present the results of the research.

INTERNET POWER AND RIGHTS

The work on Blockchain network and scalability continued, and in particular on the lighting network, the mainstream payment channel network built for Bitcoin, through the Payment Channel Networks for Blockchain Scalability project (p. 19). The goal was to analyze the capabilities and limitations of a payment channel network. To accomplish it, a simulator for payment networks was developed, under the name CLoTH. CLoTH made it possible to continue studying the scalability of the Bitcoin payment channel network.

EDUCATION

In the field of "Education", the Edu-Hack Erasmus+ project (see p. 22) was concluded. It supported many teacher's professional development through open online courses and online *hackatons*, and is now being followed by the new StrategyHack project (p. 24). It is aimed at mid-level institutional leaders and builds upon the experience gained through Edu-Hack to facilitate the digital transformation of many leaders' areas of competence, promoting personalized learning environments with strong digital components: an objective more and more sought, especially after the COVID-19 pandemic.

Moreover, the Nexa Center will participate in the CLIKC Erasmus+ project (see p. 25), which intends to find a way to train unemployed people by developing an adaptive learning web platform based on state of the art online recommendation systems.

The development of the Geranium platform, whose aim was to reduce the barriers for accessing scientific publications by citizens and to create new collaboration opportunities between researchers, was unfortunately suspended (see p. 26) due to lack of funding from the central administration. An alpha version of the Geranium platform is available at: <https://geranium.polito.it/>.

STAFF

Antonio Santangelo

*Senior Research Fellow
(former Executive Director)*



Antonio Santangelo is a semiotician. He is tenured Assistant Professor at the University of Turin, where he teaches Semiotics and Semiotics of television programmes. He also teaches Semiotics and philosophy of language, Textual Semiotics and New Media Languages at eCampus University. His main interest is in the field of media studies, where he works on the development of semiotics as a social science that can be used to understand and also to predict the meaning people may give to their experience of communication products and to their mutual interactions around them. In the last two years, he has been working on Artificial Intelligence and on the way, it can affect the public sphere, in particular the construction of public opinion. Because of his expertise, he has worked for the Italian Institutions, as he contributed to draw up the Italian White Paper on Artificial Intelligence and Public Administration, together with the Agency for Digital Italy (Agid).

Mattia Plazio

Managing Director (until Sept. 2020)



Mattia Plazio earned a degree in History and Criticism of Cinema from the Faculty of Humanities at the University of Turin. He worked in the field of e-learning, as instructional designer, and in the organization of cultural events. Since 2012 he has developed, coordinated, and managed cultural projects (Borderscapes, Spaesamenti, Gamblers) funded by private and public institutions. He writes about cinema and new media, and also collaborates with the film production company Azulfilm, as a screenwriter.

Selina Fenoglio

Administrative Manager



Selina Fenoglio joined the Nexa Center for Internet & Society in May 2009 as an administrative assistant. She holds a bachelor's degree in Economics from the University of Turin and her former experiences include the administrative management of projects funded by the European Commission, the World Bank, and the Italian Foreign Office. Since December 2010 she is the Administrative Manager of the Center.

STAFF

Giacomo Conti

Managing Director

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.

Anita Botta

Communication Manager

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 system 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. From October 2020 he is Co-Founder and CTO of Column, innovative startup which operates in the digital publishing sector.

INSTITUTIONAL NETWORKS

Beyond the work done in the four working areas mentioned above, the Nexa Center continued its participation in three important institutional networks:

- The Global Network of Internet & Society Research Centers (<https://networkofcenters.net/centers>),

- CINI, Laboratory for Informatics and Society (<https://www.con-sorzio-cini.it/index.php/it/laboratori-nazionali/lab-informatica-e-societa>)

- Scienza Nuova (<https://labont.it/areas/scienza-nuova/>).

Different from last year is the fact that Nexa Center decided to stop actively contributing to The Global Network Initiative, and the fact that prof. De Martin is no more the director of the CINI lab on Internet and Society (see p. 30), having left this role to prof. Viola Schiaffonati of the Politecnico of Milano.

TEACHING

Regarding the Nexa Center's teaching activities, the Undergraduate Course Digital Revolution (see p. 32) ended, but its aim of providing students with the multidisciplinary knowledge required to understand the digital revolution, and of teaching them practical online-world skills, continued in the new Politecnico courses Grandi Sfide Globali ("Big Global Challenges") and Politica e Tecnica ("Politics and Technology").

Director Juan Carlos De Martin held a presentation on the pandemic and its consequences in the digital world during the Tempi Difficili series of 11 lessons at the Politecnico of Turin, during which famous experts reflected upon the pandemic from various points of view (see p. 33).

The master course Digital Technologies and Society (see p. 34), which aimed at raising awareness on what it means to be a computer engineer in the age of AI and algorithms, continued throughout 2020. The second edition of the course counted 40 students enrolled and has been done through remote classes due to the pandemic. During the course, students have been asked to give a presentation on a real case of algorithmic discrimination and discuss it with the rest of the classes.

Data Ethics and Protection (see p. 35), a Master Course of Science in Data Science and Engineering, was launched last year and will continue throughout mid-June 2020. 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.

The new ongoing Semiotics of digital cultures course (see p. 35) for postgraduate degrees in Communication and Media Culture of the University of Turin started this year, lectured by prof. Antonio Santangelo. The course aims to reflect on how digital technologies that permeate our daily lives are changing the way we assign meaning to what we experience and communicate. Prof. Santangelo aims to bring to the students of the University of Turin some of the contents and themes of the research carried on at the Nexa Center, making them reflect on how digital technologies influence the functioning of our culture.

Professor Antonio Vetrò, together with Marco Torchiano, Nexa Fellow, lectured the Software Engineering II (see p. 36) master course, which provides students with basic knowledge regarding software development methods, software quality assurance and process improvement and software evolution dynamics.

The course is organized with a balance of theory (20%) and practice (80%), which reverberates on the way the final evaluation is scored. The first two editions of the course were attended by 70 and 125 students respectively.

The Nexa Center was also active in other teaching activities:

- 1) A module coordinated by Antonio Vetrò, "Blockchain for Governance", part of the Executive Master Digital Policy and Technology, of the LUISS School of Government, held from September to February 2021.
- 2) Lectures and meetings by J.C. De Martin, M. Conoscenti and A. Vetrò among the Biennale Tecnologia for Teachers and Students of Secondary Schools. These courses are meant to support teachers and students of secondary schools in understanding the digital revolution and the relationships between technology, man and society.

STAFF

Giuseppe Futia

Senior Research Fellow (until Jan. 2021)



Giuseppe Futia is Research Scientist and Knowledge Graph Engineer at the Nexa Center for Internet and Society. He received the Ph.D. degree in Computer Engineering from the Politecnico di Torino in September 2020. His research interests focus on semantic modeling, data integration, and Graph Neural Networks. He is currently the technical supervisor of Geranium, a semantic recommendation system to explore the Politecnico di Torino publications. He is also the main developer and the project manager of TellMeFirst, a tool based on Wikipedia for the semantic classification of textual contents. He is currently the assistant of Prof. Juan Carlos De Martin within the Digital Revolution course of the Politecnico. During his research activities, Giuseppe contributed to the first prototype of the ContrattiPubblici.org search engine, born within the Nexa Center, and currently developed by the start-up Synapta. In his professional career, he was also responsible for the communication of the Nexa Center and freelance journalist for the La Stampa newspaper.

Elena Beretta

Ph.D. Student (until May 2021)



Elena Beretta is a postdoctoral researcher at Vrije Universiteit Amsterdam. She is also a member of the User-Centric Data Science group (VU). She received the Ph.D. degree in Computer and Control Engineering from Politecnico University of Turin in May 2021, with a thesis entitled "Algorithms for Social Good: A Study of Fairness and Bias in Automated Data-Driven Decision-Making Systems". The Ph.D. was held in collaboration with the Nexa Center for Internet & Society and the Fondazione Bruno Kessler (Trento, Italy). She has a passion for promoting a fairness-aware-technologies development. Her research and fields of interest include: Bias and Fairness in Machine Learning and Automated Systems, Ethics of AI, Statistics and Data Science, Machine Learning and Computational Social Science.

ORGANIZATION AND COMMUNITY

Regarding the organizational aspects, there was a new entry in the Staff: Giacomo Conti became a Research Fellow and substituted Mattia Plazio in the role of Nexa Center Managing Director, working together with Giovanni Garifo (IT Manager) and Anita Botta (Communication Manager). Antonio Santangelo became a Senior Research Fellow, definitively leaving the role of Nexa Center Executive Director. Giuseppe Futia and Elena Beretta finished their Ph.D.s: Giuseppe Futia presented his doctoral thesis titled "Neural Networks for Building Semantic Models and Knowledge Graphs" in September 2020, while Elena Beretta presented her doctoral thesis titled "Algorithms for Social Good: A Study of Fairness and Bias in Automated Data-Driven Decision-Making Systems" in May 2021.

Due to the Covid-19 pandemic, there has been no chance of organizing our beloved Community Activities this year.

OUTREACH

Finally, as to the outreach work, the 12th annual conference of the Nexa Center was organized in December 2020, with the title *Speakable and unspeakable: Who decides in the age of digital communication* (<https://nexa.polito.it/conf2020>). The Nexa Center also contributed to organize the *Biennale Tecnologia*, which took place from November 12th to November 15th, 2020, an initiative that 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. (<https://nexa.polito.it/biennale-tecnologia-20>).

LOOKING AHEAD

The many European projects in which the Nexa Center is currently engaged in will certainly be the main activities of this year and the next. We are also looking forward to going back to normal after the pandemic crisis and to find funding for our researchers in this peculiar times. 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*.

Another objective is to find new valuable students that may participate in PhD studies. Indeed, the goal of education remains at the forefront of NEXA's spirit, as we strive to offer new university-level courses at the Politecnico and many publicly available activities.

STAFF

Antonio Vetrò

Senior Research Fellow



Antonio Vetrò is Assistant Professor at the Department of Control and Computer Engineering of Politecnico di Torino. He serves as Senior Research Fellow at the Nexa Center for Internet and Society and at the Future Urban Legacy Lab, in the same polytechnic university. Antonio is specialized in empirical methodologies for software engineering, with a focus on software and data quality improvement. He also conducts interdisciplinary studies on the relationship between digital technologies and society. Relying on both approaches, he is currently studying how to detect and mitigate potential discriminations deriving from biases in the data and in the algorithms of automated decision systems. He teaches in three different master courses at Politecnico di Torino: "Digital technologies and society", "Data Ethics and Data Protection", and "Software Engineering 2".

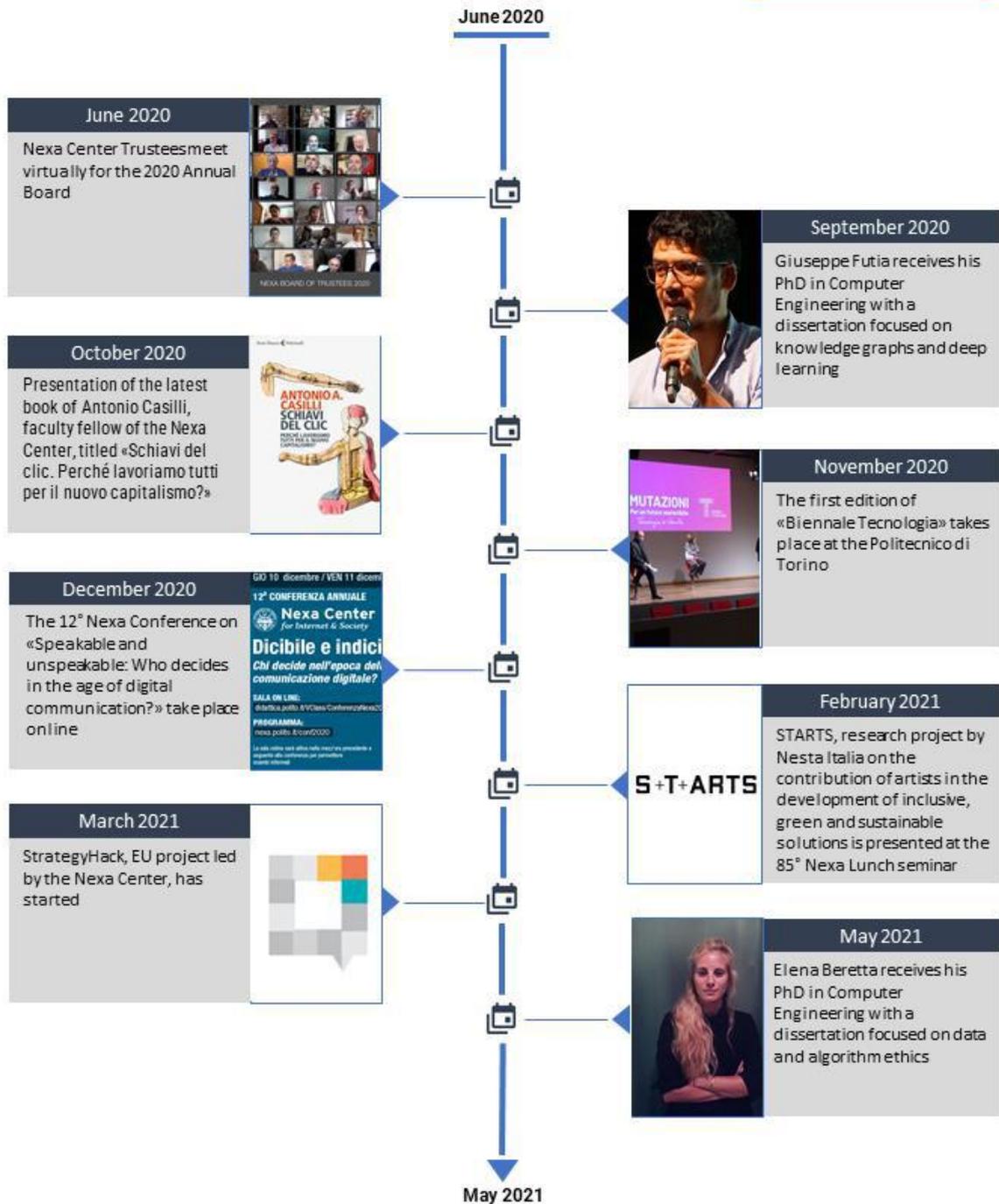
Marco Conoscenti

*Senior Research Fellow
(until May 2021)*



Marco Conoscenti is a postdoctoral researcher at the Nexa Center. He received the Ph.D. degree in Computer Engineering from Polytechnic University of Turin in October 2019, with a thesis entitled "Capabilities and Limitations of Payment Channel Networks for Blockchain Scalability". His research interests include the blockchain, Bitcoin and the Lightning Network, a payment network which aims to solve the problem of scalability of Bitcoin. He developed a simulator of the Lightning Network to identify its issues and analyze possible solutions.

Nexa Annual Story



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 Vetrò, Bruno Lepri, Juan Carlos De Martin. (2021) *Detecting discriminatory risk through data annotation based on Bayesian inferences*. In Proceedings of the 2021 ACM Conference on Fairness, Accountability, and Transparency (FAccT '21). Association for Computing Machinery, New York, NY, USA, 794–804. <https://doi.org/10.1145/3442188.3445940>

(ii) 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

(iii) Elena Beretta, Antonio Vetrò, Bruno Lepri, Juan Carlos De Martin. (2018) *Ethical and Socially Aware Data Labels*, Information Management and Big Data. SIM-Big 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.

Accepted for publication:

(i) Elena Beretta, Antonio Vetrò, Bruno Lepri, Juan Carlos De Martin. (2021) *Equality of opportunity in ranking: a Fair-Distributive Model*, Second International Workshop on Algorithmic Bias in Search and Recommendation (April 2021)

1.2 Knowledge Graphs and Deep Learning

Modeling the semantics of Data Sources with Graph Neural Networks

Project Website	https://nexa.polito.it/knowledge-graphs-and-deep-learning
Status	concluded
Period	November 2016 - January 2021
Funding	99,500 €
Funding organization	Italian Ministry of Education – University and Research; Comitato ICT
Persons in charge	Giuseppe Futia (Postdoc Researcher)

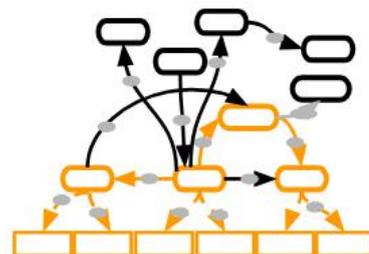
Knowledge Graphs (KGs) have emerged as a core abstraction for incorporating human knowledge into intelligent systems. This knowledge is encoded in a graph-based structure whose nodes represent real-world entities, while edges define multiple relations between these entities. KGs are gaining attention from both the industry and academia because they provide a flexible way to capture, organize, and query a large amount of multi-relational data. Deep Learning on Graphs, also known as Graph Representation Learning (GRL), represents the standard toolbox to learn from graph data. GRL techniques are able to drive improvements for high-impact problems in different fields, such as content recommendation or drug discovery. Unlike other types of data such as images, learning from graph data requires specific methods. As defined by Michael Bronstein (Imperial College London) "these methods are based on some form of message passing

on the graph allowing different nodes to exchange information".

Background

Structured data sources play a fundamental role in the data ecosystem because much of the valuable (and reusable) information within organizations and the Web is available as structured data. Publishing these data into KGs is a complex process because it requires extracting and integrating information from heterogeneous sources. The goal of integrating these sources is harmonizing their data and leading to a coherent perspective on the overall information. Heterogeneous sources range from unstructured data, such as plain text, to structured data, including table formats such as CSVs and relational databases, and tree-structured formats, such as JSONs and XMLs. The integration process of structured data is enabled

by mappings that describe the relationships between the global schema of an ontology (the semantic skeleton of a KG) and the local schema of the target data source. The results of the mapping can be seen as a graph, known as a semantic model, which can express the links between the local schema, represented by the attributes of the target data source, and the global schema, represented by the reference ontologies. A semantic model is a powerful tool for representing the mapping for two main reasons. In the first place, it frames the relations between ontology classes as paths in the graph. Secondly, it enables the computation of graph algorithms to detect the correct mapping. The research



activity related to this project concerns the automatic publishing of data into KGs from structured data sources through a mapping-based approach based on semantic models.

Objectives

The main goal of this research project is to automatize the process of creating semantic models. This goal is reached by exploiting a novel approach based on Graph Neural Networks (GNNs) to automatically identify the relations which connect already-annotated data attributes. GNNs are a subset of GRL techniques that are specialized in neighborhood aggregation to encode the representation of graph nodes and edges. In this approach, GNNs are trained on Linked Data (LD) graphs that contain semantic information and act as background knowledge to reconstruct the semantics of data sources: the intuition is that relations used by other people to semantically describe data in a domain are more likely to express the semantics of the target source in the same domain.

Results

The main achievements of this research project are the following:

(i) A PhD Thesis entitled: "Neural Networks for Building Semantic Models and Knowledge Graphs".

(ii) A journal publication: Futia, G., Vetrò, A., & De Martin, J. C. (2020). SeMi: A SEMantic Modeling machine to build Knowledge Graphs with graph neural networks. *SoftwareX*, 12, 100516.

(iii) A journal publication: Futia, G., & Vetrò, A. (2020). On the integration of knowledge graphs into deep learning models for a more comprehensible AI—Three Challenges for Future Research. *Information*, 11(2), 122.

(iv) A workshop paper: Futia, G., Garifo, G., Vetro, A., & De Martin, J. C. Modeling the semantics of data sources with graph neural networks, BRIDGE BETWEEN PERCEPTION AND REASONING: GRAPH NEURAL NETWORKS & BEYOND, ICML 2020 WORKSHOP.

(v) A conference publication: "Training Neural Language Models with SPARQL queries for Semi-Automatic Semantic Mapping" (G. Futia, A. Vetrò, A.

Melandri, J.C. De Martin), *Procedia Computer Science* 137, 187-198, describing the use of neural language model called Word2Vec for the semi-automatic semantic type detection.

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

(vii) A conference publication: "Removing barriers to transparency: A case study on the use of semantic technologies to tackle procurement data inconsistency" (G. Futia, A. Melandri, A. Vetrò, F. Morando, J.C. De Martin) - European Semantic Web Conference, 623-637.

1.3 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.
- (ii) Collect empirical evidence concerning the actual impact of the measured data quality issues on automated decisions made by software systems.
- (iii) Design of mitigation and remediation strategies and specific



techniques to reduce the problem.

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 remediation techniques for the problem.

Results

First of all, an exploratory study has been conducted ("Identifying risks in datasets for automated decision-making") with a view to investigating measurable characteristics of datasets which can lead to discriminating automated decisions. This initial study has been accepted for publication at the EGOV-CeDEM-ePart 2020 conference (<http://dqsociety.org/egov-2020/>) and has been selected as the Best Paper in the category "The most innovative research contribution or case study" (which "Awards the paper

with the most out of-the-box and forward-looking idea and concept"). After that, a more detailed research has been submitted to the Government Information Quarterly - An International Journal of Information Technology Management, Policies, and Practices (<https://www.journals.elsevier.com/government-information-quarterly>).

This subsequent study has been carried out by extending the set of imbalance measures with a view to examining in more depth the capability of such measures to detect imbalance among the classes of a given attribute in a dataset. Then, it has been taken into account a much larger number of datasets belonging to various application domains (from the criminal justice systems to financial services, but also social related topics, such as personal earnings and education), for the purpose of assessing whether the existing imbalance measures are able to reveal a discrimination risk when an ADM system is trained with such data. The final goal is to ensure a more conscious and responsible use of automatic decision-making systems.

2. Technology and Society

2.1 Biennale Tecnologia

A big cultural event with 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://2020.biennaletecnologia.it/
Status	concluded
Period	November 12th-15th, 2020
Funding	in-kind
Funding organization	Politecnico di Torino
Persons in charge	Juan Carlos De Martin (coordinator), Mattia Plazio (organization assistant)

Background

After the success of Festival della Tecnologia (<https://2019.festivaltecnologia.it/>), Politecnico di Torino, under the coordination of Professor Juan Carlos De Martin, hosted the first edition of Biennale Tecnologia (November, 12th-15th 2020, <https://2020.biennaletecnologia.it/>). Biennale Tecnologia, as well as the Festival, is 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, Biennale Tecnologia presents itself 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

Biennale Tecnologia is aimed to describe the key role that technology has taken on in all spheres of human life, from health to the environment, from personal relationships to the economy and democracy itself. To do this, Biennale Tecnologia decided to embrace an interdisciplinary approach and to adopt multiple languages, that of science, of course, but also of the humanities, art, literature, cinema, music and sport. Politecnico di Torino promoted the first edition of Biennale Tecnologia not only as its own direct expression but also as the expression of a vast and widespread network of partners

(<https://2020.biennaletecnologia.it/partner>), 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, due to the Covid-19 pandemic, took place entirely online, experimenting new way to involve a very transversal audience in a common reflection of nowadays most relevant challenges that we must face as human being. In a very difficult time of the human history, the first edition of Biennale Tecnologia wanted 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 its strategy of production and sharing of knowledge for the whole community.



Program

The first edition of Biennale Tecnologia proposed a series of online events (<https://2020.biennaletecnologia.it/programma/biennale>) mainly devoted to the topic "Mutations – for a sustainable future". Its program officially opened on November 12 with a double lecture held by two important guests who have always been attentive to innovation and new technologies: Francesca Bria, President of the National Innovation Fund, and Bruce Sterling, writer and main representative of

cyberpunk literature. Over the next three days, over 180 online lectures, panels, concerts, reading, exhibitions and other activities were scheduled, with more than 300 speakers from all over the world, included scientists, writers, sociologists, economists, philosophers and many others, who carried on the reflection on technology's impact on our society from different perspectives and with different languages. The Nexa Center, one of key partner of Festival della Tecnologia, contributed to the first edition of Biennale Tecnologia collaborating to the organization of several meetings that involved its large community of scholars and researchers (<https://nexa.polito.it/biennale-tecnologia-20>).

Results

The first edition of Biennale Tecnologia was a great success with over 20,000 attendees in 4 days, 180 online meetings and activities, 6 exhibitions, 8 online shows, more than 60 collaborations activated, 116 laboratories (online and offline) for the primary and secondary school, and a significant presence on national press. The second edition of Biennale Tecnologia will take place in autumn 2022. In the 2021, Biennale Tecnologia is collaborating to the realization of the 7th edition of Biennale Democrazia (<http://biennaledemocrazia.it>), the "friendly" event with which it shares the same interest for the promotion of a real democratic culture, also as a result of a more awareness way of thinking to technology.

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

A project that aims at strengthening the dialogue between the engineering sciences and humanities and social sciences to improve engineering education and research.

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, the Politecnico di Torino, under the guide of Prof. Juan Carlos De Martin, has founded, in October 2018, the SUSST working group, 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/>).

This project also benefits from the expertise gained throughout the University in the Digital Age research project.



Objectives

The core objective of SUSST working 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 and their research activities. Following a well-established international path, they have been introducing the contributions 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 strengthen the social impact of technical universities, adopting an interdisciplinary approach and a specific focus on nowadays controversies and challenges.
- (ii) the will to educate 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 the 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) June 2020: drafting of the first course proposal, 'Grandi Sfide', consisting of 6 great challenges to discuss with first-year bachelor students via frontal lessons and group works.
- (v) December 2020 – March 2021: institution of Grandi Sfide working group, composed by professors and researchers representing PoliTO departments and aimed at collecting

spontaneous proposals from each department.

(vi) From April 2021: finalisation of 'Grandi Sfide' teaching proposal and next formal steps.

Planned activities: additional open calls for researchers and collaborators, institution of a University-wide Center for Technology and Society.

2.3 Distributed architectures for private and efficient data management

The objective of this project is to analyze -both from the juridical and the software point of view- the potential of distributed data management architectures for telecommunications companies.

Project Website	https://nexa.polito.it/distributed-architecture-data-management
Status	Concluded
Period	August 2020- December 2020
Funding	30.000€ (VAT excluded)
Funding organization	TIM
Persons in charge	Antonio Vetrò (Senior Researcher), Marco Conoscenti (Researcher), Giacomo Conti (Researcher)

Background

Data contained in Blockchains is practically impossible to edit. Moreover, a blockchain does not contemplate the appointment of a specific and identifiable figure responsible for the content found in the blockchain itself.



Its Peer to Peer nature and the absence of a Data Controller, together with the fact that there is no easy way to edit what's already stored inside the blockchain, causes it to be incompatible with the rules regarding the

processing of personal data inside the European Union, and especially the GDPR.

Objectives

The goal of the analysis, from the juridical point of view, is to clearly and precisely list the rules that enterprises must follow, with respect to privacy, when adopting decentralized architectures, with a focus on blockchain. From the point of view of the information systems, real experimentations of distributed architectures in scenarios relevant to telecom companies are synthesized.

Results

The research found that while a traditional blockchain is in-

deed incompatible with the current legislations, there are indeed many tools that can be of aid while trying to set up a database of personal data based on blockchain technology.

These solutions are both technical and juridical, and often twist the nature of the blockchain to the point where it almost becomes not a blockchain anymore.

Through some of these solutions, however, the data stored in the blockchain can reach sufficient standards of anonymity and protection, and a central figure, the Data Controller, can be identified more easily if the blockchain becomes more centralized, therefore solving the main incompatibility problems.

3. Internet Power and Rights

3.1 Payment Channel Networks for Blockchain 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 allow 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

4. Education

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

A project that builds a new approach to teaching and learning in order to improve digital skills of the Higher Education teachers

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 Fenoglio (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 (2013) to "support teachers' professional development through open online courses" 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), the Edu-Hack project 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.



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 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 three 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

Throughout its development, the Edu-Hack project has created:

(i) *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.

(ii) *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 to each learner is granted a web-space in which build and share knowledge in collaboration with other learners.

(iii) *EduHack intensive training sessions* (<https://eduhack.eu/eduhackathons/>). 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.

(iv) *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.

(v) *EduHack Toolbox* (<https://eduhack.eu/outputs/04/the-toolbox-contents-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 the project, the first experimentation of the EduHack capacity-building programme (EduHack online course + EduHackathon, offline and online) has been successfully performed 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/network/>), a network of institutions interested in using EduHack materials and services in the future.

4.2 STRATEGYHACK – Hacking Institutional Strategy for Rapidly Deployed Digital Education

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

Project Website	https://nexa.polito.it/StrategyHack
Status	ongoing
Period	March 2021 - March 2023
Funding	292.450 € (54.880 € 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), Giacomo Conti (Project Manager), Anita Botta (Senior Researcher), Selina Fenoglietto (Administrative Manager), Giovanni Garifo (IT Technician)

Building upon the experience previously obtained through the EduHack project, and run by Politecnico di Torino (Italy), Universidad Internacional de La Rioja (Spain), Coventry University (UK), Knowledge Innovation Centre (Malta), MEDEA (Belgium), and Association Europeenne d'Institutions de l'Enseignements Superieur (Belgium), Strategyhack aims to build skills for mid-level institutional leaders to accelerate the digital transformation of their areas of competence.

Background

Efforts to curb the outbreak of COVID-19 led to the closure of education and training buildings, campuses and other sites and a forced shift to emergency modes of digital education.

In many Member States, most institutional leaders, in particular those in mid-level positions, had little if any experience of organising teaching and learning online or the different infrastructural, human resource and administrative challenges associated with it.

The gulf between responses of different institutions to the crisis has shown that leadership is one of the most important enabling factors for a successful move-to-digital.

Institutions that had previously invested in building the digital capacity of their management were better prepared to adapt teaching approaches, keep learners engaged, and continue the education and training process.



Objectives

StrategyHack supports the priorities of the Digital Education Plan, focuses on capacity building on mid-level institutional leaders since a resilient transformation requires strengthening the connecting tissue between the high-level management strategy level and the digital-pedagogy level which these personnel provide. It intends to:

- Accelerate digital transformation of staff, programmes and institutional processes within Higher Education;
- Promote and nourish high quality self-directed personalised learning environments.
- Lock in gains made to perceptions of digital learning during the COVID crisis, and using these to promote more sustainable models of digital education.

Results

The following results are expected upon completion of the project:

- A *Capacity Building Course on Digital Education Strategies for Institutional Leaders*. This online course will be based around a set of 15-20 essential skills, with one micro-module being designed to teach each skill.
- Providing a *Peer-Learning Methodology for Institutional Strategies based on Hackathon-Style Events*. Inspired by the idea of hackathons, StrategyHack will propose and design intensive online events, with participants over several sessions identifying a problem, sharing best practices on potential solutions and then working in small groups to propose solutions.
- A strategy-guidance document, *Model Management System for digital education*, that will give institutional leaders amap to build their institutional strategies meant to integrate digital learning into the institution's identity and brand, to provide strategic approaches to manage risks and sustainability, methodologies to manage resources efficiently and to provide tools and techniques to tackle the

most challenging operational activities in digital education.

4.3 CLIKC

An Erasmus+ project which intends to experiment with an innovative way to effectively train unemployed people

Project Website	N/A
Status	ongoing
Period	June 2021 - May 2023
Funding	48.244 € for Nexa
Funding organization	European Commission (Erasmus+)
Persons in charge	Giovanni Garifo (Machine Learning Engineer and Software Developer)

CLIKC is an Erasmus+ project which intends to experiment with an innovative way to effectively train unemployed people, in an attempt to shorten the duration of the unemployment period and allow the active labor market system to focus on weaker categories. The project aims to create and test an educational catalog and a new distance learning tool of their kind, focusing on 4 innovations described as follows:

- innovations regarding the teaching methodology (Content Language Integrated Learning and Micro-Learning)
- innovations concerning the ICT intermediation tool (Adaptive Learning and Advanced Analytics)

Moreover, the training catalogue will focus on 4 specific skills in the area of basic personal and relational skills.

Background

Unemployment is one of the more relevant issues in the European Union. In 2019 7,5% of work force in the EU-19 area was unemployed (6,7% in EU-27 area) and 44% of them was jobless since more than 12 months. The 2012 EFSI (European Fund for Strategic Investments) study asserts that the annual cost of each unemployed person is roughly

25.000 euros and, although only 25,2% of unemployed people receives economic public subsidies, the total annual cost of unemployment is around 90 billion euros per year. In particular, it is the length of individual unemployment periods which constitutes a threat for the social and economic sustainability of the system. It is crucial to support rapidly unemployed people with placement and career services. Training is a powerful driver of employability support. Skills are the main asset capable of qualifying the job offer and their enhancement is essential to support entry and permanence in the market. Among the skills that have the greatest impact on employment, a specific weight is covered by transversal skills: "personal, relationships and learning skills" are defined by (Recommendation of the EU Council 189/2018 as key competences.

Objectives

The project will develop one deliverable, namely the adaptive learning web app containing a multilingual catalog of modular teaching pills on the above-mentioned key competences, to be used in different foreign languages (CLIL): Italian, English, Spanish and German. Furthermore, the contents will be divided into 15-minute didactic objects (micro-

learnings) to allow a fruition in pills provided through ICT devices (desktop or mobile). The courses will be included in a Web Application for the use of asynchronous e-learning. The platform will use 2 technologies: adaptive learning and advanced analytics. A system powered by artificial intelligence will select for each user the didactic objects (among 544) most suitable for him and update the path based on individual learning outcomes. Advanced analysis and reporting systems will feed user dashboards aimed at both individual users (unemployed) and labour market operators who will be able to integrate the tool into the ordinary methods of verifying skills, orientation and training.

Results

No results have been achieved, as the project is still in the beginning stages.

4.4 Geranium

Empowering Open Access of Polito publications using Semantics and Deep Learning.

Project Website	https://geranium.polito.it
Status	Suspended
Period	January 2019 – Present
Funding	In-kind
Funding organization	N/A
Persons in charge	Giuseppe Futia (Research Fellow), 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 KnowledgeGraph (KG), (ii) a search engine to explore the publications of PoliTO researchers and (iii) a recommendation system based on Graph Neural Networks. An alpha version of the Geranium platform is available at: <https://geranium.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.biblio.polito.it/13163/>. The research project is currently suspended due to the lack of fundings.

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 imple-

mented 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 first version of Geranium has been developed by: (i) Giuseppe Futia (Project lead), (ii) Giovanni Garifo (lead software developer), Mehdi Khrichfa (back-end developer), Cosma Alex Vergari (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

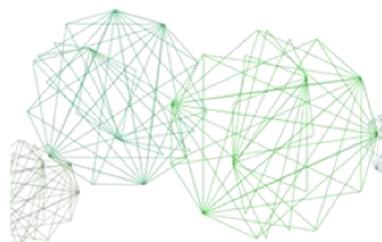
Project Website	http://networkofcenters.net/
Status	ongoing
Period	October 2014 - present
Funding	80.000 € (until 2016)
Funding organization	Compagnia di San Paolo (in-kind from 2017)
Persons in charge	Juan Carlos De Martin (Coordinator), Antonio Santangelo (Senior Researcher)

The Global Network of Internet & Society Research Centers (NoC) is a collaborative initiative among academic institutions (<https://networkofcenters.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.networkofcenters.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.nexacenter.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/nexacenterfiles/Beretta_Data_Ethics.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).

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/nexacenterfiles/Beretta_Data_Ethics.pdf) within the Conference "AI: Legal & Ethical Implications" held in the Center for Cyber Law & Policy, University of Haifa (<http://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).

From 2019 onwards, the Nexa Center continued to collaborate with its community by participating in the ["NoC @IGF 2020"](#) and in the [Research Sprint "AI and Content Moderation"](#). As part of the Internet Governance Forum 2020, the NoC organized, in collaboration

with Wikimedia Italia, the Virtual Village Booth: the Nexa Center participated in the ["Interactive Chats"](#), with a speech by Juan Carlos De Martin (available [here](#)) to talk about the projects of the center and the experience of Biennale Tecnologia, and contributed to populating a virtual exhibition space dedicated to the works of the centers pertaining to the NoC. As part of the project ["The Ethics of Digitalisation – From Principles to Practices"](#), organized by Alexander von Humboldt Institute for Internet and Society (HIIG), the Nexa Center participated in the Research Sprint "AI and Content Moderation", with an interview with Juan Carlos De Martin and Antonio Vetrò:

the sprint, which took place virtually over the course of ten weeks from August until October 2020, was the first research format of the project "The Ethics of Digitalisation – from Principles to Practices" under the patronage of the German Federal President Frank-Walter Steinmeier. This project, which will run until July 2022, aims to foster a global dialogue on the ethics of digitalisation by involving stakeholders from academia, civil society, policy, and the industry. The project comprises research sprints and smaller clinic formats hosted by several research institutes of the Global Network of Centers..

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. Since 2020, Nexa stopped following the Initiative's activities and actively contributing to its efforts.



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



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.consortio-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	Viola Schiaffonati (Director, since January 2020) Antonio Santangelo (Senior Researcher), Antonio Vetrò (Senior Researcher), Mattia Plazio (Management)

The CINI - Italian National Inter-University Consortium for Informatics (<https://www.consortio-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.consortio-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://infosocieta-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	concluded
Period	2012 – 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), Giuseppe Futia (teaching assistant).

Background

"Rivoluzione Digitale" (Digital Revolution) was 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 aimed 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

**RIVOLUZIONE
DIGITALE**

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). Although the course is no longer offered, two new ones ("Grandi sfide globali" and "Politica e tecnica") have been activated. Both courses partly continue Rivoluzione Digitale's mission.

6.2 "Tempi difficili"

Maps to find our way out of the first pandemic of the 21st Century

Project Website	http://biennaletecnologia.it/tempi-difficili
Status	ongoing
Period	March – June (2021)
Funding	Standard funding by Politecnico di Torino
Funding organization	Politecnico di Torino
Persons in charge	Juan Carlos De Martin

Background

The Covid-19 pandemic caused a worldwide crisis that is having a deep impact in every aspect of our life: economic, political, cultural, psychological and social. After a particularly difficult year, the Politecnico di Torino wanted to promote a new initiative: a short course - intended for students in the first place but open to everyone - to try and find our way out of a crisis that is causing confusion and uncertainty.



pandemic from various points of view, trying to provide useful means to cope with the predicament in which we found ourselves in.

Results

Throughout "Tempi difficili" we successfully livestreamed 11 lessons, about 45 to 60 minutes long, followed by 10 to 15 minutes of live interaction with our audience. The on-demand videos are available [here](#).

Objectives

That is why the University designed "Tempi Difficili - Mapped to orient oneself in the first pandemic of the XXI century": a journey in 11 stops during which famous experts will reflect upon the

6.3 "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, 2021)
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 interdisciplinary, 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 oral 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 and third edition of the course counted respectively 40 and 32 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 class.

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

A Politecnico di Torino master course (Master of Science in Data Science and 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 (2020,2021)
Funding	Standard funding by Politecnico di Torino (additional support in-kind)
Funding organization	Politecnico di Torino + Nexa internal funding
Persons in charge	Alessandro Mantelero (co-coordinator and lecturer), Juan Carlos De Martin (co-coordinator and 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.



tems.

Results

The first edition of the course is taking place in the Academic Year 2019/2020: lectures are from March 2020 until mid-June 2020. The students enrolled in the course first edition were 164, while those enrolled in the new academic year are 209.

Due to the Covid-19 global emergency, in both editions, the classes were held remotely.

6.5 Semiotics of digital cultures

A course at the postgraduate degree in Communication and Media Cultures of the University of Turin

Project Website	https://media.campusnet.unito.it/do/corsi.pl/Show?id=7lso
Status	ongoing
Period	2021-present
Funding	Standard funding of Università degli Studi di Torino
Funding organization	Università degli Studi di Torino
Persons in charge	Antonio Santangelo (lecturer)

"Semiotics of digital cultures" is a course for the postgraduate degree in Communication and Media Cultures of the University of Turin. The course aims to reflect on how the digital technologies that permeate our daily lives are changing the way we assign meaning to what we experience and communicate. Specifically, it focusses on how the advent of computers, the Internet, smartphones and now artificial intelligence have brought a structural change in the way the media system works, giving rise to new forms of media experience and new ways of telling ourselves and reality.

Background

The course is an attempt of Antonio Santangelo to bring to the students of the University of Turin (who are students in the field of humanities) some of the contents and themes of the research carried on at the Nexa Center. In particular, the idea is to "translate" for the students of

the University of Turin some of the contents of the old course "Digital Revolution", that Juan Carlos De Martin held at the Politecnico of Turin.



Objectives

The overall training objectives of the course are the following:

- to understand the meaning of the choices made by those who design digital technologies such as, for example, Artificial Intelligence applications. In this regard, the focus is on the influence of certain cultural models and values on the ideas that have led us to imagine and use these technologies as we do today;

- to understand how certain digital technologies, designed

according to these choices, influence the functioning of our culture. In this regard, the focus is on some communication practices typical of our time, such as social networking around selfies, the processes of public opinion formation around the so-called "viral" contents, the spread and the "battle" against fake news and post-truth, the use of social networks by politicians and mass media, storytelling techniques that integrate the "old" media and the most advanced digital technologies.

Results

In the first year, the course has been attended from 120 students and has been very appreciated, in particular the parts concerning the critics to the surveillance capitalist system put in place by the digital platforms, and the part on the ethics of algorithms and of Artificial Intelligence.

6.6 "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,

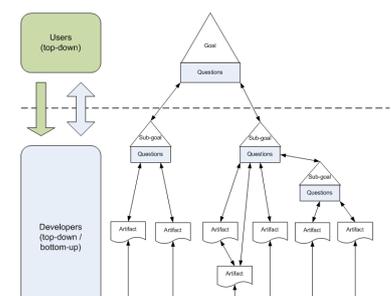
iv) set up self-organizing teams.

Results

The first two editions of the course were attended by respectively 70 and 125 students.

The course is organized with a balance of theory (20% of the evaluation) and practice (80% of the evaluation): conventional

lectures introduce the theory concerning the main topics of the course. Such lectures are followed by practical sessions (either collective exercises or hands-on development sessions). A key component of software development that is exercised is teamwork, including coordination of individuals and their interactions, leveraging stakeholders' collaboration, and achieving self-organization. The course obtained very high satisfaction among students.



6.7 Other teaching activities

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

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

Riconessioni is an education project (www.riconessioni.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 <https://www.riconessioni.it/to/laboratori/essere-digitali/> (in Italian).

Executive Master "Digital Policy and Technology" - LUISS School of Government

Antonio Vetrò has been responsible for a teaching module at the Executive Master "Digital Policy and Technology" of the LUISS School of Government, held from September to February 2021. The Master Executive, realized in collaboration with Facebook, offered a multidisciplinary and training path, combining the study of political communication with the latest trends in technological development. The Master's program addressed four main areas: Fundamentals; Technology and Policy; Methods and Techniques; and Network Policy. The Master has been addressed to graduates in political, sociological and communicative disciplines, as well as to an audience of professionals in the world of

politics and public administration, to deepen the main issues related to the relationship between democracy, politics and technology. The professional figures trained included public policy-makers, private decision-makers and innovation managers of companies with a strong technological vocation, public communicators and press officers of public and private organizations operating in the field of digital technologies, and digital strategists of actors such as parties, trade unions, non-governmental organizations.

The module coordinated by Vetrò Antonio was "Blockchain for Governance" with a duration of 10 hours and the following content: development of blockchain; applications in decision-making; blockchain governance and public administration. Lectures have been given by Antonio Vetrò for the part on automated decision making with a focus on bias and fairness, while Marco Conoscenti introduced the blockchain working mechanisms and illustrated use cases for governance purposes.

More information on the Executive Master can be retrieved at <https://sog.luiss.it/it/formazione-executive/executive-digitali>

Biennale Tecnologia for Teachers and Students of Secondary Schools

In 2021, the Biennale Tecnologia has decided to strongly relaunch its commitment to supporting teachers and students at secondary schools, following up on the proposal of activities and laboratories promoted and carried out during its first edition. The new proposal of the Biennale Tecnologia, in line with the current scholastic context, has been designed as a useful complement to traditional and

mixed presence-distance teaching, which integrates and expands the classroom work of teachers and individual study. At the center of the training offer is the rich archive of lessons and online meetings of the Biennale Tecnologia 2020, a wealth of living knowledge that becomes a precious tool in the hands of teachers and students to deepen, with an interdisciplinary approach, topical issues around the relationship between technology, man and society. This valorization of the rich archive of content of the Biennale Tecnologia passed through the selection and the proposal of five thematic paths that deal with sensitive themes ranging from Artificial Intelligence to environmental sustainability, from health to the impact of the digital revolution, up to investigating the unusual but fervent relationship between technology and literature. For each path, the formula is as follows: (a) an introductory lecture on the subject by a teacher to be delivered preferably live; b) a critical in-depth study of the topic by the teachers of the schools, through the deferred use of some of the Biennale meetings dedicated to it; c) a follow-up meeting in which the teacher, or more likely some of his researchers, will once again be the protagonist, in a live dialogue with the students and aimed at answering their doubts and curiosity.

The Nexa Center has been involved both in the organization of the initiative (J.C. De Martin and M. Plazio) and in the thematic path, with lectures (J.C. De Martin) and meetings (M. Conoscenti and A. Vetrò) on "We and the digital revolution". More information at <https://www.biennaletecnologia.it/biennale-tecnologia-le-scuole> (in Italian)

7. Funding, Organization, Relationships & Community

7.1 Budget summary

Table 1 below summarizes the total costs sustained by the Nexa Center in fiscal year 2020.

Research personnel		230,200 €
Nexa Center staff	146,900 €	
Tenured personnel	64,000 €	
Research Ph.D.	19,300 €	
Other personnel		60,300 €
Other costs		91,500 €
Events organization and communication	2,900 €	
Travel (Nexa)	1,100 €	
Travel (guests/speakers)	600 €	
Equipment	2,400 €	
Functioning costs (heating, phone, cleaning, etc.)	3,900 €	
Outlays for the use of the Center venue	20,000 €	
Surplus from projects to PoliTo personnel	16,500 €	
Indirect costs (contribution to the Polytechnic University of Turin budget, deducted from Nexa projects)	44,100 €	
Total costs		382,000 €

Table 1 Nexa Center: costs sustained in 2020

"Research Ph.D." (see Table 1) includes Ph.D. student: 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 (Anita Botta), 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). 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 Poly-

technic 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 decrease: it was 44,100 € in 2020 and it will be at least 6,100 € in 2020.

7. Funding, Organization, Relationships & Community

Project / other source of funding	2020	2021	2022
StrategyHack		18,900 €	36,000 €
Clikc		12,600 €	35,600 €
SIFIS-HOME		7,900 €	22,100 €
EDU- HACK	31,200 €		
DECODE	17,000 €	35,700 €	
Past projects leftover	5,400 €	3,000 €	55,100 €
Grant from Telecom Italia (Distributed architectures)		27,100 €	2,900 €
Grant from TIM S.p.A. (Connected Drones)	25,800 €	6,300 €	
Grant from TIM S.p.A. (AI)	30,600 €		
Grant from AGID (White paper on Artificial Intelligence)	31,600 €	13,000 €	
Riconessioni project - Fondazione per la Scuola della Compagnia di San Paolo	14,500 €	13,400 €	
Digital library education project - Fondazione Esperienze di Cultura Metropolitana	2,500 €		
Gift from Foundation P&R	21,800 €		23,300 €
Gift from Urs Gasser	1,000 €		
Gift from Comitato ICT	25,100 €		
Research Ph.D.	19,300 €		
Research funding by Polytechnic University of Turin	2,800 €	5,000 €	53,200 €
Contribution in kind from Polytechnic University of Turin (mainly personnel effort)	123,400 €	123,600 €	123,600 €
Contribution in kind from Prof. Marco Ricolfi	30,000 €	30,000 €	30,000 €
Total	382,000 €	296,500 €	381,800 €
Project / other source of funding	2020	2021	2022

Table 2 Nexa Center: expected funding in 2020, 2021 and 2022 (as of April 2021)

Table 2 provides an overview of the sources of funding in 2020 and an estimation of the expected funding in 2021 and 2022, 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 2020. In those cases, the figures reported do not capture the entire amount of the funding.

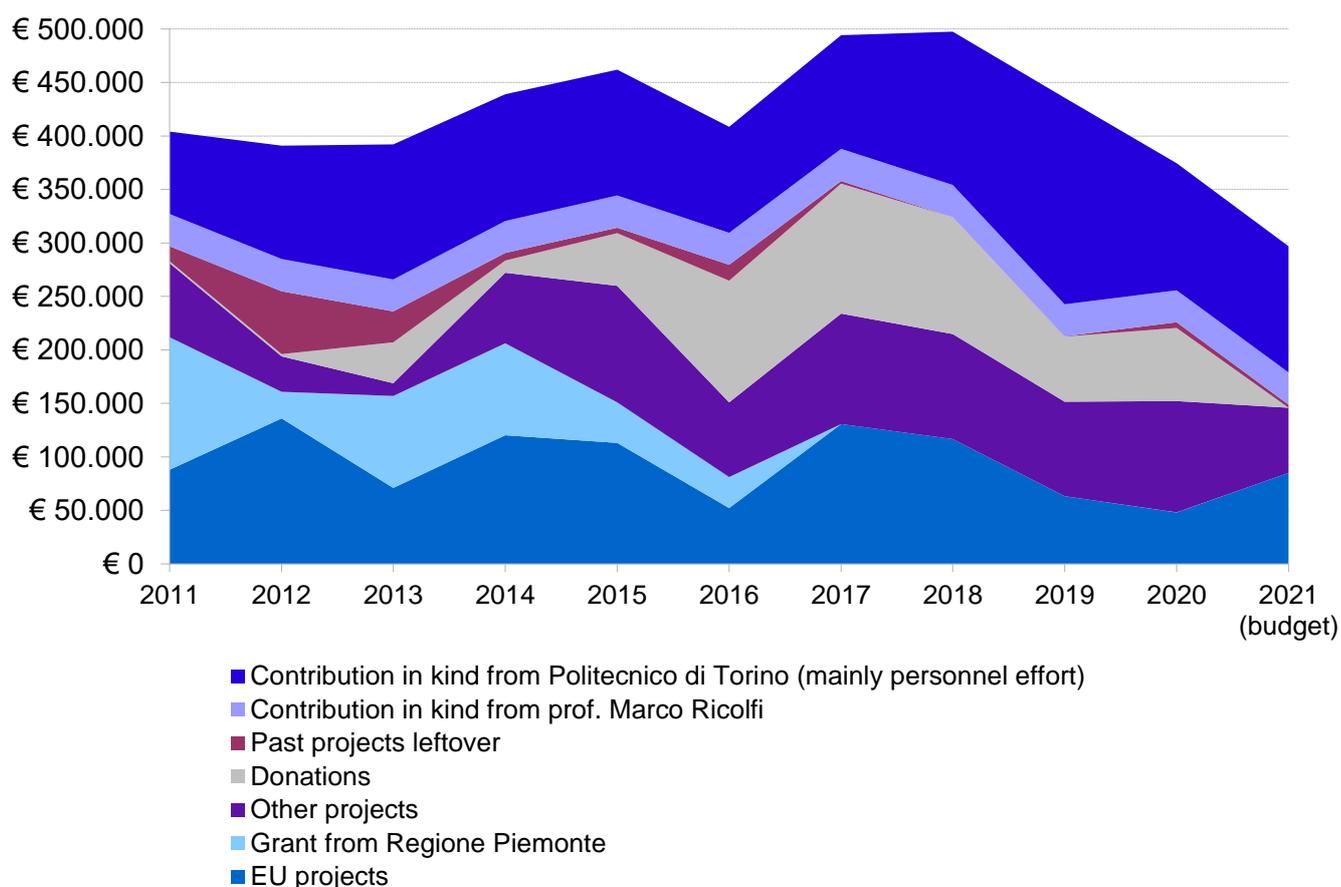


Figure 1 Composition of available financial resources (in Euros), 2011-2021

Figure 1 reports the composition of the available financial resources from 2011 to 2021 (forecasts only for 2021). 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 Center budget 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 TIM, Foundation P&R and Fondazione per la Scuola della Compagnia di San Paolo) remained below the 15% cap (implying a maximum funding of about 57,300 € in 2020). The same goes for the criteria expressed at point 3. Given the estimations of the 2021 budget, all criteria will be respected also in the next reporting period.

Funding coming from for-profit entities	% of 2020 budget (absolute value)	% of 2021 budget (absolute value)
TIM	14,76 %	11,26 %
TIM S.p.A. Via G. Negri 1, 20123 Milano	(56,400 €)	(33,400 €)
Total from for-profit entities	14,76 %	11,26 %

Funding coming from no-profit entities	% of 2019 budget (absolute value)	% of 2020 budget (absolute value)
Foundation P&R	5,71 %	
Foundation P&R, <i>Via dell'Annunciata 23/2 20121 Milano</i>	(21,800 €)	
Fondazione per la Scuola della Compagnia di San Paolo	3,80%	4,52 %
Corso Ferrucci, 3 10138 Torino	(14,500 €)	(13,400 €)
Total from for-profit entities	9,51 %	4,52 %

7.3 Project Proposal

7.3.1 Next ITA (Next Generation ITA)

Content and Language Integrated Learning for Key Competences

Project Website	N/A
Status	Under evaluation
Period	N/A (duration: 36 months)
Funding	1.043,322 € (224,029 € for Nexa)
Funding organization	MIUR (Ministry for Education, University and Research) – PRIN 2020
Persons in charge	Antonio Vetrò, Juan Carlos De Martin, Marco Ricolfi

Abstract

The result of this project will be threefold: (1) to conceptualize the notion of documedial capital, (2) to analyze implications of this analysis

in related notions of labor, capitalization and values, (3) to explore the notion of big data in relation to the very large digital platforms and in a way that is

functional to the establishment of a FTI.

NEXA's role in the project will be: (1) to conceptualize the notion of documedial capital and to analyze implications of this analysis in related notions of labor and value;

(2) analyze the concentrations of power within the ICT world, especially in what are known as

very large platforms, and to propose strategies for rebalancing them;

(3) identify the technical tools best suited to make documedia capital a source of resources for welfare. NEXA will partner with Università di Torino, Politecnico di Torino, Università di Trento, Università Cattolica del Sacro Cuore and Scuola Superiore Sant'Anna di Pisa.

7.4 Organizational aspects

During the reporting period, there have been significant changes in the Nexa Staff.

One new person has joined the Nexa Staff:

Giacomo Conti became a Research Fellow of the Nexa Center for Internet & Society and substituted Mattia Plazio in the role of Nexa Center Managing Director, working together with Giovanni Garifo (IT Manager) and Anita Botta (Communication Manager). His research interests include law studies concerning contemporary technologies. Giacomo graduated in Law with a thesis on contractual liability for defective software and is a member of the Order of Journalists of Piedmont since 2016.

A special mention is due to the Senior Research Fellow of the Nexa Center, Antonio Vetrò.

A special thanks for his work is due to Antonio Santangelo, who left the role of Nexa Center Executive Director and became officially a Senior Researcher of the Center, maintaining the role of tenured Assistant Professor at the Philosophy Department of the University of Turin.

A special thanks for their work is also due to people who left the Nexa Staff:

Mattia Plazio: left the Nexa Center in October 2020, after collaborating with it since 2017 as Managing Director. He started working at the Culture and Communication Office of the Politecnico di Torino.

Giuseppe Futia: received the Ph.D. degree in Computer Engineering from the Politecnico di Torino in September 2020 presenting a thesis focused on "Knowledge Graphs and Deep Learning".

Elena Beretta: received the Ph.D. degree in Computer Engineering from the Politecnico di Torino in in May 2021, presenting a thesis focused on "Data and Algorithm Ethics".

Marco Conoscenti: left the Nexa Center at the end of May 2021, concluding his postdoctoral research focused on "Payment Channel Networks for Blockchain Scalability".

In addition, as every year, young scholars collaborated

with the Nexa Center, working to support the Nexa Staff in the current activities. In the academic year 2020/2021, Andrea Ciccarello graduated in Computer Engineering (Master's de-

gree) with a thesis entitled "Design of a mobile payment application and performance comparison with the Lightning Network", under the supervision of Antonio Vetrò and Marco Conoscenti; Angelo Pili

is currently working on a thesis to study the centrality of Lightning Network payment channel, under the supervision of Antonio Vetrò and Marco Conoscenti.

7.5 Nexa Community

Nexa Trustees

The current list of the Nexa Trustees is available on page 55 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 63 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.

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 to collaborate with the University of Turin in order to promote an interdisciplinary approach to the topics covered during the monthly meetings. On January 13, 2021, on the occasion of the 136° Nexa Wednesday, Giovanni Leghissa, Associate Professor at the Department of Philosophy and Educational Science of the University of Turin, was invited to talk about power structures and control technologies, with particular attention to the connection between digital technologies and organizational life. The Center also invited Simone Natale and Cristina Voto, professor and researcher at the University of Turin, to hold two meetings focused on the relationship between artificial intelligence, media and art: on March 10, 2021, on the occasion of the 138° Nexa Wednesday, Simone Natale presented his latest book, "Deceitful Media: Artificial Intelligence and Social Life after the Turing Test", while on March 24, 2021, on the occasion of the 86° Nexa Lunch Seminar, Cristina Voto held a seminar about "Facial Recognition in Art".

The Center also actively participated in the organization of the first edition of "Biennale Tecnologia", which follows the success of the Festival della Tecnologia, organized in 2019 by the Politecnico di Torino to celebrate the 160th anniversary of its foundation. This year the Politecnico di Torino has proposed, in close synergy with the local actors, a permanent appointment dedicated to the decisive role that technology has taken on in all areas of human life, from health to the environment, from personal relationships to democracy itself: the Biennale Tecnologia, which took place from November 12th to November 15th, 2020. 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.

This year the Center has also begun to collaborate with the *Italian Institute for Advanced Studies in Torino 'Umberto Eco'* "Scienza Nuova" in order to reflect on the "Digital Revolution" through different perspectives. Together with "Scienza Nuova" we have so far organized seven internal seminars with guests from the two centers, and two public meetings with special guests who have recently published books on relevant topics

in the discussed field. The two books selected were: "Gli schiavi del clic. Perché lavoriamo tutti per il nuovo capitalismo?", written by Antonio Casilli (University Télécom Paris), and "Il tuo capo è un algoritmo. Contro il lavoro disumano", written by Antonio Aloisi (University of Madrid) and Valerio De Stefano (University of Leuven).

To deal with the health emergency, every event organized by the Center has been moved online; we have decided to adopt Jitsi Meet, an open source teleconference service, for holding remote meetings.

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 storytelling, which is a multimedia product that communicates its narrative through a multitude of integrated media channels for several Educational uses.

8.2 12th Annual Conference: *Speakable and unspeakable: Who decides in the age of digital communication?*

On December 10th and 11th, 2020, the 12th yearly Nexa Conference on Internet & Society took place virtually due to the health emergency.

This year the Conference focused on the contribution of communication technologies to the formation of public opinion,

highlighting issues such as the relationship between the so-called "traditional media" and the "new media", the circulation of information on social platforms and the problems that can arise from practices such as "hate speech", "politically correct" and the spread of so-called "fake news". In order to

help the public find their way around these issues, the conference supported the dialogue between different knowledge, including information technology, law, economics, philosophy and journalism.

Several sector experts who

come from the scientific and humanistic academic fields have been involved, but also businessmen and media professionals. The Conference included researchers, professionals and lawyers. The keynote and panel speeches foresaw an array of different perspectives: economic, legal, societal and engineering. For instance, an interesting keynote speech, held by Stefania Maurizi (Il Fatto Quotidiano) in dialogue with Anna Maserà (La Stampa), proposed a reflection on the Assange Case, while another panel speech, held by Mario Tedeschini Lalli

(Journalist and Educator), Giovanna Cosenza (Università di Bologna) and Dino Amenduni (Proforma), focused on the role of social media in our society.

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 #nexa2020).

For additional information, see <https://nexa.polito.it/conf2020>.



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, 140th Nexa Wednesday have taken place.

During the meetings, the audience following the live streaming can join the discussion via Twitter. Attendance at Nexa Wednesdays as a rule exceeds 20 and sometimes 30 participants. 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/mercoledì>.

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

130th Nexa Wednesday: Computational power. The impact of ICT on law, society, knowledge; June 10, 2020; guests: Massimo Durante (Università degli Studi di Torino) and Luciano Floridi (University of Oxford).

131th Nexa Wednesday: For an ethical Big Data sharing strategy: from Coop to Co-App; July 8, 2020; guest: Giovanni Rinaldi (Legacoop).

132th Nexa Wednesday: Natural Intelligence and Artificial Intelligence: Reflections between Science and Ethics; September 9, 2020; guest: Marcello Lenca (ETH Zurich).

133th Nexa Wednesday: Software Preservation in Networked Art; October 14, 2020; guest: David Schumde (Software Engineer).

134th Nexa Wednesday: The governance of drones: the new services between European rules, freedom of individuals and public security; November 11, 2020; guests: Eleonora Bassi (Fellow Nexa Center) and Giovanni Battista Gallus (Fellow Nexa Center).

135th Nexa Wednesday: Legal Tech and deontology: the experience of "Who Hates Pays"; December 9, 2020; guest: Giuseppe Vaciago (Fellow Nexa Center).

136th Nexa Wednesday: Organizations as artifacts. Power structures and control technologies; January 13, 2021; guest: Giovanni Leghissa (Università degli Studi di Torino).

137th Nexa Wednesday: The right 'of' artificial intelligence; February 10, 2020; guest: Ugo Pagallo (Trustee Nexa Center).

138th Nexa Wednesday: Deceptive machines: Artificial Intelligence after the Turing test; March 10, 2021; guest: Simone Natale (Università degli Studi di Torino).

139th Nexa Wednesday: The Imagined Future. Speculative Design in the exploration of the future; April 14, 2021; guest: Gloria Puppi (Novus Lab).

140th Nexa Wednesday: Open Education. OER, MOOC and open teaching practices towards educational digital inclusion; May 12, 2021; guest: Fabio Nascimbeni (Fellow 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:

79th Nexa Lunch Seminar: Data-Driven Economy: holistic approach in regulation ex ante and ex post; June 24, 2020; guest: Emanuele Fazio (Università degli Studi di Trento).

80th Nexa Lunch Seminar: Children and digital literacy, during and beyond the COVID-19 emergency; July 22, 2020; Fabio Nascimbeni (Fellow Nexa Center).

81th Nexa Lunch Seminar: From equality to equity: an interdisciplinary perspective on mitigating algorithmic unfairness in ranking systems; September 23, 2020; guest: Elena Beretta (PhD Nexa Center).

82th Nexa Lunch Seminar: "It can be done!" Hackathon, Self-efficacy and critical digital skills of teachers; October 28, 2020; guest: Luca Morini (University of Coventry).

83th Nexa Lunch Seminar: Not just Zoom. Digital platforms for distance learning, between copyright and personal data protection; November 25, 2020; guests: Guido Noto La Diega (Fellow Nexa Center) and Rossana Ducato (University of Aberdeen).

84th Nexa Lunch Seminar: eXplainable AI for Everyone. Interpreting artificial intelligence through semantic technologies; January 27, 2021; guest: Giuseppe Futia (PhD Nexa Center).

85th Nexa Lunch Seminar: STARTS (Science + Technology + Arts): the contribution of artists in the development of inclusive, green and sustainable solutions; February 24, 2021; guest: Simona Bielli (Nesta Italia).

86th Nexa Lunch Seminar: Facial recognition in art. Opacity of machines and attempts to unveil; March 24, 2021; guest: Cristina Voto (Università degli Studi di Torino).

87th Nexa Lunch Seminar: The risks of digital sovereignty; April 28, 2021; guests: Simone Basso (OONI) and Edoardo Celeste (Dublin City University).

88th Nexa Lunch Seminar: Blockchain e Privacy: an impossible combination?; May 26, 2021; guest: Giacomo Conti (Research Fellow 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. Since 2020 the Nexa Center has decided to collaborate with the *Italian Institute for Advanced Studies in Torino 'Umberto Eco' "Scienza Nuova"* in order to reflect on the "Digital Revolution" through different perspectives.

This is a short summary of Nexa Research Seminars that have

taken place during the last reporting period:

Le potenze del capitalismo politico. Stati Uniti e Cina (Alessandro Aresu, 2020): September 17, 2020; held by Juan Carlos De Martin (Politecnico di Torino).

Gli schiavi del clic. Perché lavoriamo tutti per il nuovo capitalismo? (Antonio Casilli, 2020): October 23, 2020; held by Antonio Casilli (University Télécom Paris).

Dominio e sottomissione. Schiavi, animali, macchine, intelligenza artificiale (Remo Bodei, 2019): November 20, 2020; held by Enrico Donaggio (Università di Torino).

Il tuo capo è un algoritmo. Contro il lavoro disumano (Antonio Aloisi e Valerio De Stefano, 2020): December 18, 2020; held by Antonio Aloisi (University of Madrid) and Valerio De Stefano (University of Leuven).

The Internet Myth. From the Internet imaginary to network ideologies (Paolo Bory, 2020): January 22, 2021; held by Antonio Santangelo (Università di Torino).

The Twenty-Six Words That Created the Internet (Jeff Koseff, 2019): February 19, 2021; held by Carlo Blengino (Lawyer, Il Post).

Superintelligence. Paths, Dangers, Strategies (Nick Bostrom,

2016): March 19, 2021; held by Giovanni Leghissa (Università di Torino).

Documanità. Filosofia del mondo nuovo (Maurizio Ferraris, 2021): April 23, 2021; held by

Maurizio Ferraris (Università di Torino).

Weapons of Math Destruction. How Big Data Increases Inequality and Threatens Democ-

racy (Cathy O'Neil, 2016) compared to Hello World: Being Human in the Age of Algorithms (Hannah Fry, 2018): May 21, 2021; held by Stefano Leucci (Law and Technology Officer).

8.6 Other Meetings

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

Biennale Tecnologia: after the success of the Festival della Tecnologia organized in 2019 by the Politecnico di Torino to celebrate the 160th anniversary of its foundation, the University has proposed, in close synergy with the local actors, a permanent appointment dedicated to the decisive role that technology has taken on in all areas of human life, from health to the environment, from personal relationships to democracy itself: the Biennale Tecnologia, which took place from November 12th to November 15th, 2020. The initiative, of which the Nexa Center was an active partner, 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, fellows and staff members of the Nexa Center within the festival:

Inaugural lecture: November 12, 2020; held by Francesca Bria (Trustee Nexa Center) and Bruce Sterling (Trustee Nexa Center).

8.7 External Events

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

1st Critical Requirements Engineering Workshop

Squaring the circle: how to integrate circular economy and innovation: November 13, 2020; chaired by Luca De Biase (Trustee Nexa Center).

Psychoanalysis and Technology: November 13, 2020; held by Juan Carlos De Martin (Co-Director Nexa Center).

New technologies and the future of energy: the challenge of the ecological transition: November 13, 2020; chaired by Luca De Biase (Trustee Nexa Center).

Democracy and Digital: November 13, 2020; held by Fabio Chiusi (Fellow Nexa Center).

Special supervised. Artificial Intelligence in our lives: November 13, 2020; held by Stefano Quintarelli (Trustee Nexa Center).

What the crisis did not teach us: November 14, 2020; held by Luca De Biase (Trustee Nexa Center).

Machines that decide, and how to make them democratic: November 14, 2020; held by Fabio Chiusi (Fellow Nexa Center) and Juan Carlos De Martin (Co-Director Nexa Center).

Arts, Science and Technology for the development of cities: the experience of the STARTS Project in Europe November 14, 2020; chaired by Francesca Bria (Trustee Nexa

Center).

The free software revolution: November 14, 2020; held by Marco Ciurcina (Fellow Nexa Center) and Angelo Raffaele Meo (Trustee Nexa Center).

Hybrid school in the time of the pandemic: November 14, 2020; chaired by Lorenzo Benussi (Fellow Nexa Center).

Criticism of unlimited development, between hopes and contradictions: November 14, 2020; chaired by Luca De Biase (Trustee Nexa Center).

Age without secrets: how hackers and leaks change the public sphere: November 14, 2020; held by Anna Masera (Trustee Nexa Center).

Screen will be you. No more protagonists, but part of the theater: November 15, 2020; introduced by Luca De Biase (Trustee Nexa Center).

Immersed in the future. The virtual reality new frontier of cinema and tv: November 15, 2020; held by Simone Arcagni (Faculty Fellow Nexa Center).

Technology and young humanity: November 15, 2020; held by Juan Carlos De Martin (Co-Director Nexa Center).

(CREW2020): Power, Politics, Values and Responsibilities in RE practice and theory: Antonio Vetrò participated by invitation in the workshop organized within the 28th IEEE International

Requirements Engineering Conference (Zurich, August 31 – September 4, 2020).

21st International Conference on Product-Focused Software Process Improvement: Antonio

Vetrò was the Journal First chair of the 21st International Conference on Product-Focused Software Process Improvement, which took place online on November 26-27, 2020.

Webinar 5 "Tools for Public Administrations", organized by EOLE (European Open-source and free software law event): Marco Conoscenti presented an open source software evaluation procedure for the Public Administration, the result of the 2019 collaboration between the Nexa Center and AgID (March 17th, 11:30 – 13:00 CET).

Bridge between perception and reasoning: graph neural networks & beyond, ICML 2020 Workshop: Giuseppe Futia presented his paper "*Modeling the semantics of data sources with graph neural networks*"

(Giuseppe Futia, Giovanni Garifo, Antonio Vetrò, Juan Carlos De Martin) at the ICML 2020 Workshop focused on deep learning and graph neural networks (July 18, 2020).

AI + Knowledge – a match made in heaven?: Giuseppe Futia participated in the talk about Knowledge Graphs and Machine Learning/Deep Learning, organized within the event Knowledge Connexions 2020 (November 30, December 1 and December 2). Giuseppe spoke at the event together with Isabelle Augenstein (University of Copenhagen), Nathan Benaich (Air Street Capital), Amy Hodler (Neo4j), Katariina Kari (Zalando SE) and Fabio Petroni (Facebook AI Research).

WiDS Conference 2021: on July 15-16, 2021, Elena Beretta was invited to speak at Women

in Data Science Conference. The Women in Data Science (WiDS) initiative aims to inspire and educate data scientists worldwide, regardless of gender, and to support women in the field.

ACM Conference on Fairness, Accountability, and Transparency (ACM FAccT '21): on March 3-10, 2021, Elena Beretta presented her paper "Detecting discriminatory risk through data annotation based on Bayesian inferences".

Second International Workshop on Algorithmic Bias in Search and Recommendation (Bias 2021): on April 1, 2021, Elena Beretta presented her paper "Equality of opportunity in ranking: a Fair-Distributive Model".

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 36.396 sessions from 17.810 different visitors, with an increase of 39.55%, compared to the last year's sessions.

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 2020 – 2021 our website had three exceptional peaks in popularity in May 2020, in occasion of the 129th Nexa Wednesday, focused on evaluation and comparison of open source software for Public Administration, in June 2020, in occasion of the 130th Nexa Wednesday, focused on the computational power and the impact of ICT on law, society, knowledge, and in December 2020, in occasion of the 12th Nexa Annual Conference, focused on the contribution of communication technologies to the formation of public opinion.

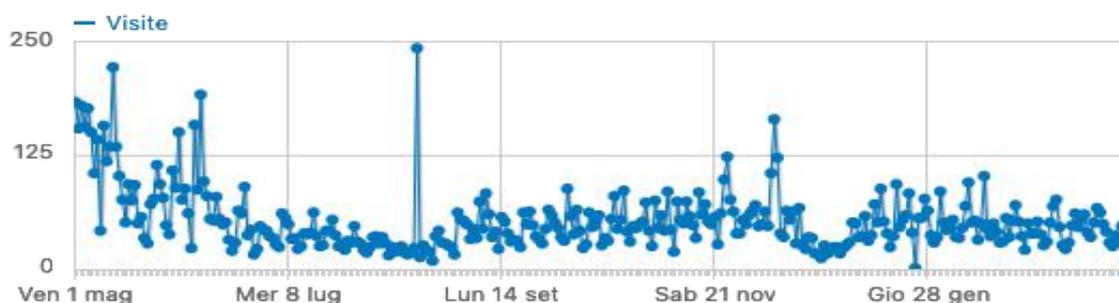
During the reporting period the website obtained a good international exposure: if 66,9% of traffic came from Italy, about 13,5% came from the US, about 3,3% from UK, about 2,3% from France, about 2% from Germany

(about 1% each from Spain, Canada, India, China and Russia).

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 graph, relevant to the reporting period, (Figure 1 from Matomo), which include daily page-views of the Nexa website, show peaks in May, June, and December 2020, as previously described, and a peak in August

Figure 1



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 120 messages since May 2020 until March 2021);

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"

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 startappers) 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.



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 851 members (824 one year ago) and collected 3.390 posts since May 2020 until April 2021 (last year the list collected 1.992 posts);

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

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.digitcult.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.

use of social networks Facebook (<https://www.facebook.com/nexa.center>) and twitter (<https://twitter.com/nexacenter>). On Twitter, the Center has 4.425 followers (an increase of 10% over the previous year). The total number of fans on Facebook is 2.508 (an increase of 10% over the previous year). YouTube Channel: the channel has 373 subscribers (an increase of 30% over the previous year) and contains a total of 328 videos; lifetime views: 47.408; reporting period: about 5.932 views for a total of 46.794 minutes watched. The most watched video is the 12th Nexa Annual Conference, focused on the contribution of communication technologies to the formation of public opinion.

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.

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 2 of the EXECUTIVE SUMMARY.

Marco Ricolfi – Co-Founder and Co-Director

See dedicated box at page 2 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 Strategy & 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, LL.M., 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 Managing 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 assistant in the Department of Justice Civil Rights Division. His first case, White v. Crook, made race

and gender-based jury selection in Alabama unconstitutional. Nesson joined the Harvard Law School faculty in 1966, and was tenured in

1969. He is "currently leading a project to reify university as a meta player in cyberspace, to legitimize and teach poker and the value of strategic poker thinking, and to advance restorative justice in Jamaica". In 2006 he taught *CyberOne: Law in the Court of Public Opinion* with Rebecca Nesson and Gene Koo. He teaches courses in the law and practice of Evidence (how to prove the "truth"), Trials in Second Life, and a reading group with Fern Nesson on Freedom.

Ugo Pagallo



Ugo Pagallo is a former lawyer and current professor of Jurisprudence at the Department of Law, University of Turin (Italy), member of the Expert Group set up by the EU Commission on liability and new technology/new technologies formation, he is also working with the European Institute for Science, Media, and Democracy (Atomium), in order to set up AI4People, the first global forum in Europe on the Social Impacts of Artificial Intelligence. He is also collaborating with the IEEE Global Initiative for Ethical Considerations in AI and Autonomous Systems; the European Science Foundation of Strasbourg,

France; and the Joint International Doctoral (PhD) degree in Law, Science and Technology, part of the EU's Erasmus Mundus Joint Doctorates (EMJDs). Author of eleven monographs and numerous essays in scholarly journals and book chapters, his main interests are Artificial Intelligence & law, network and legal theory, and information technology law (specially data protection law and copyright). The Japanese edition of his book on *The Laws of Robots* is available since Spring 2018.

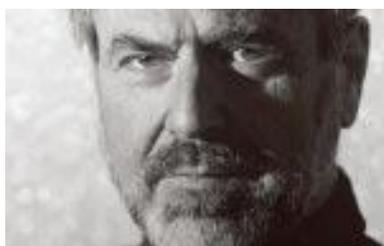
Maria Chiara Pievatolo



Maria Chiara Pievatolo is professor of political philosophy in the Department of Political Sciences at the University of Pisa. She has been theorizing and practicing the open access publishing in the field of humanities since the 90s of the last century, first as political philosophy editor of the *Sito Web Italiano per la Filosofia* (SWIF) founded by Luciano Floridi, and then as curator and founder of the "Bollettino telematico di filosofia politica", of the "Giuliano Marini" Archive, and of the book series *Methexis*. She is also a member of the open access Crui committee and one of the founding members

of the Aisa (Associazione italiana per la promozione della scienza aperta). Since the end of 2014 she has been one of the associate editors of the *Directory of the Open Access Journals* (Lund University). Since 2015, she has been the vice-president of the Associazione Italiana per la promozione della scienza aperta. A detailed list of her works, many of which hypertextual, experimental, openly accessible, can be found here: https://unimap.unipi.it/cercapersone/dettaglio.php?ri=5829&template=dett_publicazioni.tpl

Michelangelo Pistoletto



Michelangelo Pistoletto was born in Biella in 1933. He began to exhibit his work in 1955 and in 1960 he had his first solo show at Galleria Galatea in Turin. An inquiry into self-portraiture characterizes his early work. In the two-year period 1961-1962 made the first *Mirror Paintings*, which directly include the viewer and real time in the work, and open up perspective, reversing the Renaissance perspective that had been closed by the twentieth-century avant-gardes. These works quickly brought Pistoletto international acclaim, leading, in the sixties, to one-man shows in important galleries

and museums in Europe and the United States. The *Mirror Paintings* are the foundation of his subsequent artistic output and theoretical thought. In 1965 and 1966 he produced a set of works entitled *Minus Objects*, considered fundamental to the birth of *Arte Povera*, an art movement of which Pistoletto was an animating force and a protagonist. In 1967 he began to work outside traditional exhibition spaces, with the first instances of that "creative collaboration" he developed over the following decades by bringing together artists from different disciplines and diverse sectors of society. In 1975-76 he presented a cycle of twelve consecutive exhibitions, *Le Stanze*, at Galleria Stein in Turin. This was the first of a series of complex, year-long works called "time continents". Others are *White Year* (1989)

and Happy Turtle (1992). In 1978, in a show at Galleria Persano in Turin, Pistoletto defined two main 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



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).

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;

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



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.

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.*

Massimo Durante – Faculty Fellow



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.

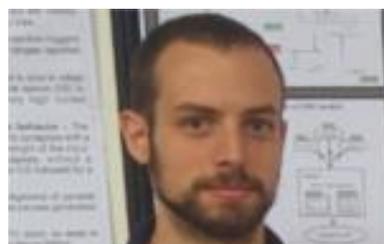
Massimo Durante is Researcher in Philosophy of Law at the Department of Law of the University of Turin. He holds a Ph.D. in Philosophy of Law, Department of Law, University of Turin, and a Ph.D. in History of Philosophy, Faculty of Philosophy, University of Paris IV Sorbonne. He teaches courses in Legal 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, Com-

Marco Torchiano – Faculty Fellow



Marco Torchiano is an associate professor at the Control and Computer Engineering Dept. of Politecnico di Torino, Italy; he has been post-doctoral research fellow at Norwegian University of Science and Technology (NTNU), Norway. He received an MSc and a PhD in Computer Engineering from Politecnico di Torino. He is Senior Member of the IEEE, member of the software engineering committee of UNINFO (part of ISO/IEC JTC 1), faculty fellow of the Nexa Center on Internet & Society. He is author or co-author of over 150 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 studying software energy consumption. His current research interests are: green software, UI testing methods, open-data quality, and software 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 University 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. Cogneetti 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 Giuridica, 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 an Application Engineer for Machines Systems dedicated to sheet metal working at Prima Industrie S.p.A. While showing potentialities of automated production lines, he is also taking care of projects related to Augmented Reality and Artificial Intelligence in the context of processes optimization.

He has been adjunct professor of the "Digital Revolution" course (Rivoluzione Digitale) held by prof. De Martin at Politecnico di Torino from 2015 (<https://rivoluzionedigitale.polito.it/about-en>).

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.

Lorenzo holds a II level master degree in Manufacturing 4.0 from Politecnico di Torino. He is registered at the Engineers register (Albo Ingegneri) of Torino as industrial engineer..

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".

Arturo Filastò – Fellow



Arturo Filastò (@hellais) is Vice President of Hermes - Center for Transparency and Digital Human Rights and he is a free software developer at GlobaLeaks and The Tor Project. He studied Mathematics and is currently student of Computer Science at Università di Roma "La Sapienza". He collaborates with the Nexa Center in software development for network measurements, in particular those aimed at identifying cases of censorship.

Giovanni B. Gallus – Fellow



Giovanni Battista Gallus is a lawyer, admitted before the Supreme Court, ISO 27001:2005 Certified Lead Auditor, founding member of the law firm "GM-LEX Studio Legale", and member of Array.eu, a network of IT Lawyers. He holds an LL.M. granted by the University of London - UCL, and a PhD by the University of Molise. He practices mainly in the field of Criminal Law, ICT Law, Copyright and Data Protection Law, Drone Law. He is teaching assistant in Information Technology Law and Advanced Information Technology Law at the School of Law of the University of Milan.

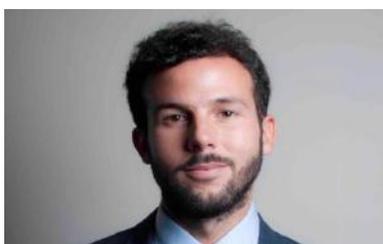
Former President of the Italian Association of Cyberlawyers ("Circolo dei Giuristi Telematici"), and fellow of the Hermes Center for Transparency and Digital Human Rights, and a passionate user and supporter of Free Software. Author and co-author of several books and articles, among which "Contenuti aperti, beni comuni" (McGraw-Hill, 2009) and "The new Information Technology Crimes" (Giappichelli, 2009).

Raimondo Iemma – Fellow



Raimondo Iemma is application manager in the ICT dept. of FCA Italy. Between 2007 and 2011, he worked for research and no profit institutions. He joined the Nexa Center in 2012 as Staff Research Fellow, serving as Managing Director for three years between 2013 and 2015, and managing coordinator of the Global Network of Internet & Society Research Centers for one year. His interests encompass open data, linked data, and open government (a list of his publications is available at iris.polito.it/cris/rp/rp14877). He holds a MSc in Engineering management from Politecnico di Torino.

Guido Noto La Diega – Fellow



Guido Noto La Diega is a Sicilian academic and practitioner who has been working on law & innovation for over a decade in Italy, the UK, Switzerland, Germany, Brazil, and Russia.

Noto La Diega is Associate Professor of Intellectual Property and Privacy Law at the University of Stirling (Scotland), where he is Deputy Director of the LLB Programmes, teaches Media Law and Intellectual Property Law, and carries out research at the Center for Research on Information, Surveillance, and Privacy (CRISP). His main expertise is in Internet of Things, Artificial Intelligence, cloud

computing, robotics, and blockchain. Holder of a PhD (Unipa), a postdoc (QMUL), and an HEA Fellowship, Noto La Diega has a strong publication and bidding record and their works on Cyber Law and Intellectual Property have been cited by the EU Court of Justice's Advocate General, the House of Lords, the European Commission, and the Council of Europe, amongst others. In parallel to his commitments at Stirling and Nexa, Noto La Diega is Coordinator of the Scottish Law and Innovation Network (SCOTLIN) funded by The Royal Society of Edinburgh; Director of 'Ital-IoT' Centre of Multidisciplinary Research on the Internet of Things; Visiting Professor at the University of Macerata; Fellow of NINSO Northumbria Internet & Society Research Group; and Trustee & Executive Committee Member of the Society of Legal Scholars, the oldest and largest society of law academics in the UK and the Republic of Ireland.

Alongside research and teaching, Noto La Diega is a qualified lawyer called to the Bar of Italy in 2013 (non-practising) and Co-founder of consultancy firm DPA2018. He was part of the team who carried

out "The law of Service Robots" collaboration between TIM's JOL CRAB and the Nexa Center for Internet and Society. He is currently completing a monograph on "Internet of Things and the Law" for Routledge and on research projects about copyright and lecture capture.

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 Estudios 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 independent 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 textbooks, 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'inserito «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 Center for International Intellectual Property Studies (CEIPI), University of Strasbourg, the Director of the CEIPI Master 2 in European and International Intellectual Property Law, and the Academic Coordinator of the CEIPI Advanced Training in Artificial Intelligence and Intellectual Property Law. 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). For over eleven years now, he has been 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 from 2010 to 2013. Giancarlo is also a Visiting Professor at the University of Turin, School of Management, a Visiting Professor and Chief Researcher at the Int'l Laboratory of IT and IP law of the Higher School of Economics of the National Research University in Moscow, and a Faculty Associate of the NEXA Research Center for Internet and Society in Turin. 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. 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. In this context, his research has been covering a vast array of topics, including copyright law, digitization, history of creativity, public domain, open access, Internet and user based creativity, IP rights at large and IP enforcement online, Internet regulation, fundamental rights online, intermediary liability of online service providers, data protection, networked information economy, access to knowledge (A2K), identity politics, and artificial intelligence and the law. Giancarlo is the author of numerous legal articles and publications. His latest book is titled *Reconciling Copyright with Cumulative Creativity: the Third Paradigm* and was published with Edward Elgar in 2018. He is also the editor of the *Oxford Handbook of Online Intermediary Liability* published by Oxford University Press (2020).

Daniele Trincherò – Faculty Associate



Daniele Trincherò 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

Irene Domenicale – Intern 2019-2020
Cosma Alex Vergari - Intern 2018-2019
Nicolas D'amazio – Intern 2019
Viola Inui Biffi – Intern 2019
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 Segà – 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 – Senior Research Fellow

See dedicated box of the EXECUTIVE SUMMARY.

Antonio Vetrò – Senior Research Fellow

See dedicated box of the EXECUTIVE SUMMARY.

Selina Fenoglietto – Administrative Manager

See dedicated box of the EXECUTIVE SUMMARY.

Anita Botta – Communication Manager

See dedicated box of the EXECUTIVE SUMMARY.

Giovanni Garifo – IT Manager

See dedicated box of the EXECUTIVE SUMMARY.

Mattia Plazio – Managing Director (until September 2020)

See dedicated box of the EXECUTIVE SUMMARY.

Giacomo Conti – Managing Director

See dedicated box of the EXECUTIVE SUMMARY.

Marco Conoscenti – Senior Research Fellow (until May 2021)

See dedicated box of the EXECUTIVE SUMMARY.

Giuseppe Futia – Senior Research Fellow (until January 2021)

See dedicated box of the EXECUTIVE SUMMARY.

Elena Beretta – Ph.D. Student (until May 2021)

See dedicated box of the EXECUTIVE SUMMARY.

1.7 Interns

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 applied to machine learning algorithms. Flavio is a technology enthusiast and during academic years worked in many projects as Web developer and data scientist.

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

M. Ricolfi, A. Cogo, [Administrative Enforcement of Copyright Infringement in Europe](#), in G. Frosio (ed) [The Oxford Handbook of Online Intermediary Liability](#), Oxford University Press, 2020, 586-610.

Giuseppe Futia; Vetrò, Antonio; De Martin, Juan Carlos, *SeMi: A SEmantic Modeling machine to build Knowledge Graphs with graph neural networks*, SOFTWAREX, Elsevier, pp. 10, 2020, Vol. 12, ISSN: 2352-7110, DOI: 10.1016/j.softx.2020.100516,

Giuseppe Futia, and Antonio Vetrò. "On the integration of knowledge graphs into deep learning models for a more comprehensible AI—Three Challenges for Future Research." *Information* 11.2 (2020): 122.

Giuseppe Futia, Antonio Vetrò, and Juan Carlos De Martin. "SeMi: A SEmantic Modeling machine to build Knowledge Graphs with graph neural networks." *SoftwareX* 12 (2020): 100516.

Marco Conoscenti, Antonio Vetrò, Juan Carlos De Martin, *CLoTH: a Lightning Network Simulator*, SoftwareX.. Accepted.

Peer Reviewed Articles in Conference proceedings

Beretta, Elena; Vetro', Antonio; Lepri, Bruno; De Martin, Juan Carlos, *Equality of Opportunity in Ranking: a Fair-Distributive Model. Second International Workshop on Algorithmic Bias in Search and Recommendation (BIAS@ECIR2021)*. Accepted.

Beretta, Elena; Vetro', Antonio; Lepri, Bruno; De Martin, Juan Carlos, *Detecting discriminatory risk through data annotation based on Bayesian inferences In: Proceedings of the 2021 ACM Conference on Fairness, Accountability, and Transparency (ACM FAccT 2021)*, Online March 3-10, 2021, pp. 11,

Futia, Giuseppe, Giovanni Garifo, Antonio Vetrò, and Juan Carlos De Martin. "Modeling the Semantics of Data Sources with Graph Neural Networks", ICML Workshop.

Mecati, Mariachiara; Cannavò, Flavio Emanuele; Vetrò, Antonio; Torchiano, Marco, *Detecting discriminatory risk through data annotation based on Bayesian inferences Identifying Risks in Datasets for Automated Decision-Making*, LECTURE NOTES IN COMPUTER SCIENCE, In: Electronic Government, Springer (SVIZZERA), EGOV2020 – IFIP EGOV-CeDEM-EPART 2020, Linköping University (Sweden) 31 August (Monday) – 2 September (Wednesday), 2020, pp. 13, 2020, Vol. 12219, ISSN: 0302-9743, ISBN: 978-3-030-57598-4, DOI: 10.1007/978-3-030-57599-1_25

Book Chapters

M. Ricolfi, *I segni distintivi di impresa, Marchio ditta insegna*, in P. Auteri-G. Florida-V. Mangini-G. Olivieri-M. Ricolfi-R. Romano-P. Spada, *Diritto Industriale. Proprietà Intellettuale e concorrenza*, Giappichelli, Torino, 2020, 75-207.

M. Ricolfi, *Trademarks and Human Rights*, in P. Torremans (ed), *Intellectual Property*.

Other Publications

M. Ricolfi, *Le operazioni di garanzia su marchio*, in *Giur. comm.* 2020, I, 475-489.

Publications by Nexa Fellows

Books

Antonio A. Casilli (2020) *Schiavi del clic. Perché lavoriamo tutti per il nuovo capitalismo?*. Feltrinelli Editore.

Book Chapters

Paola Tubaro, Louise Ryan, **Antonio A. Casilli**, Alessio D'angelo (2020). *Social network analysis: New ethical approaches through collective reflexivity. Introduction to the special issue of Social Networks*, Social Networks, Online first.

Paola Tubaro, **Antonio A. Casilli** & Marion Coville (2020). *The trainer, the verifier, the imitator: Three ways in which human platform workers support artificial intelligence*. *Big Data & Society*, 7(1).

Antonio A. Casilli (2020). *Le travail à inégales distances [Scalable labor]. Par ici la sortie ! : cahiers éphémères et irréguliers pour saisir ce qui nous arrive et imaginer les mondes de demain*, pp. 147-153. Paris: Editions du Seuil, 2020.

Paola Tubaro, Clément Le Ludec, **Antonio A. Casilli** (2020). *Counting 'micro-workers': societal and methodological challenges around new forms of labour*. *Work Organisation, Labour & Globalisation*, 14 (1): 67-82.

Laura Robinson, Jeremy Schulz, Aneka Khilnani, Hiroshi Ono, Shelia R. Cotten, Noah McClain, Lloyd Levine, Wenhong Chen, Gejun Huang, **Antonio A. Casilli**, Paola Tubaro, Matias Dodel, Anabel Quan-Haase, Maria Laura Ruiu, Massimo Ragnedda, Deb Aikat, Natalia Tolentino (2020). *Digital inequalities in time of pandemic: COVID-19 exposure risk profiles and new forms of vulnerability*. *First Monday*, 25(7).

Laura Robinson, Jeremy Schulz, Hopeton S. Dunn, **Antonio A. Casilli**, Paola Tubaro, Rod Carvath, Wenhong Chen, Julie B. Wiest, Matias Dodel, Michael J. Stern, Christopher Ball, Kuo-Ting Huang, Grant Blank, Massimo Ragnedda, Hiroshi Ono, Bernie Hogan, Gustavo S. Mesch, Shelia R. Cotten, Susan B. Kretchmer, Timothy M. Hale, Tomasz Drabowicz, Pu Yan, Barry Wellman, Molly-Gloria Harper, Anabel Quan-Haase, Aneka Khilnani (2020). *Digital inequalities 3.0: Emergent inequalities in the information age*. *First Monday*, 25(7).

Antonio A. Casilli (2020). *Economia, genealogia e conflitti del capitalismo delle piattaforme*. In: Niccolò Cuppini e Maël Dif-Pradalier (eds). *La digitalizzazione del lavoro. Sguardi globali, nuove forme e nuovi attriti, impatto sul lavoro sociale*, SUPSI, pp. 60-64.

M. Durante, "Governance del digitale. Aporie della nuova intermediazione" in L. Taddio, G. Giacomini (a cura di), *La filosofia del digitale*, Mimesis, Udine, 2020, pp. 223-242.

Peer Reviewed Articles in Journal and Magazines

E. 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* 100 (2), 493-503;

E. Bassi, *The Governance of Unmanned Aircraft Systems (UAS): Aviation Law, Human Rights, and the Free Movement of Data in the EU*, pubblicato da *Minds and machines* 30 (3), 439-455.

Ciurcina M., *Etica hacker?*, in DigitCult | Scientific Journal on Digital Cultures, 2020, 5, 1, 67-76,

M. Durante, *Computational Power. The Impact of ICT on Law, Society and Knowledge*, Routledge, New York-London, 2021

M. Durante, "Technology and the Ontology of the Virtual" in S. Vallor (ed.), *The Oxford Handbook of Philosophy of Technology*, Oxford University Press, 2020

G. Frosio, *Sharing or Platform Urban Mobility? Propertization from Mass to MaaS*, in *Smart Urban Mobility: Law, Regulation, and Policy* 163-189 (Michèle Finck, Matthias Lamping, Valentina Moscon, Heiko Richter eds., MPI Studies on Intellectual Property and Competition Law, Springer 2020);

Christophe Geiger, **Giancarlo Frosio** and Elena Izyumenko, *Intermediary Liability and Fundamental Rights*, in *The Oxford Handbook of Online Intermediary Liability* 138-152 (Giancarlo Frosio ed., Oxford University Press 2020);

Peer Reviewed Article in Conference proceedings

Antonio A. Casilli (2020). *Preparare, verificare, imitare: perché il lavoro umano è necessario alla produzione di intelligenze artificiali* [Preparing, verifying, imitating: why human labor is necessary to produce AI]. *L'enigma del valore. Il digital labor e la rivoluzione tecnologica* (Atti del convegno organizzato da Effimera, 1° giugno 2019, Milano, Casa della Cultura). pp. 25-41, Milano: Effimera.

Other Publications

G. Frosio, *L'(!)Autore inesistente: una tesi tecno-giuridica contro la tutela dell'opera generata dall'Intelligenza Artificiale*, 29 AIDA (2020);

Giancarlo Frosio and Oleksandr Bulayenko, *Study on Dynamic Blocking Injunctions*, commissioned by the European Intellectual Property Office (EUIPO) (March 2021);

Giancarlo Frosio and Christophe Geiger, *Taking Fundamental Rights Seriously in the Digital Service Act's Platform Liability Regime*, Study Commissioned by Copyright for Creativity (C4C) (2020);

G. Frosio, *The Origins and History of Remix in Creative Culture*, in *The Handbook of Remix Studies and Digital Humanities* 19-35 (Eduardo Navas, Owen Gallagher and Xtine Burrough eds., Routledge 2021);

G. Frosio, *Copyright – Is the Machine an Author?*, in *Artificial Intelligence in the Audiovisual Sector* 87-115 (European Audiovisual Observatory, IRIS Special 2020-2, 2021);

Ahmed Tlili, **Fabio Nascimbeni**, Daniel Burgos, Xiangling Zhang, Ronghuai Huang & Ting-Wen Chang (2020) *The evolution of sustainability models for Open Educational Resources: insights from the literature and experts*, *Interactive Learning Environments*, DOI: 10.1080/10494820.2020.1839507

Huang, R., Tlili, A., Chang, T., Zhang, X., **Nascimbeni F.** and Burgos. *Disrupted classes, undisrupted learning during COVID-19 outbreak in China: application of open educational practices and resources*. *Smart Learn. Environ.* 7, 19 (2020). <https://doi.org/10.1186/s40561-020-00125-8>

Tur, G., Havemann, L., Marsh, D., Keefer, J. M., & **Nascimbeni, F.** (2020). *Becoming an open educator: towards an open threshold framework*. *Research in Learning Technology*, 28. <https://doi.org/10.25304/rlt.v28.2338>

Nascimbeni, F., Burgos, D., Spina E. and Simonette, M. J. (2020). *Patterns for higher education international cooperation fostered by Open Educational Resources*, *Innovations in Education and Teaching International*, 57(2). DOI: 10.1080/14703297.2020.1733045

Zhang, X., Tlili, A., **Nascimbeni, F.** et al. (2020). *Accessibility within open educational resources and practices for disabled learners: a systematic literature review*. *Smart Learning Environments* 7(1).

<https://doi.org/10.1186/s40561-019-0113-2> Stracke, C., Downes, S., Conole, G. **Nascimbeni, F.** And Burgos, D. (2020). *Are MOOCs Open Educational Resources? A literature review on history, definitions and typologies of OER and MOOCs*. Open Praxis, 11(4). DOI: <http://dx.doi.org/10.5944/openpraxis.11.4.1010>

Nascimbeni F. (2020) *Empowering University Educators for Contemporary Open and Networked Teaching*. In: Burgos D. (eds) *Radical Solutions and Open Science. Lecture Notes in Educational Technology*. Springer, Singapore. DOI: https://doi.org/10.1007/978-981-15-4276-3_8

Nascimbeni, F. (2020). *Open Education Resources in Italy*. In Huang, R., Liu, D., Tlili, A., Gao, Y., Koper, R. (2020). *Current State of Open Educational Resources in the "Belt and Road" Countries*. In *Lecture Notes in Educational Technology*. DOI: 10.1007/978-981-15-3040-1