

(Universal) City Simulator

Open questions & Ideas for a Joint Research

Purpose of the research

How to make the simulator a reality?

To formalize the **concept** and the **functioning** of a multi-scale urban simulator, as much as to estimate the required **resources**.

The aim of the research is to create mathematical and statistical models of an urban environment that allow to simulate urban scenarios and to create an exploratory and decision-making tool.

What is it?

A multi-layered virtual model of the city

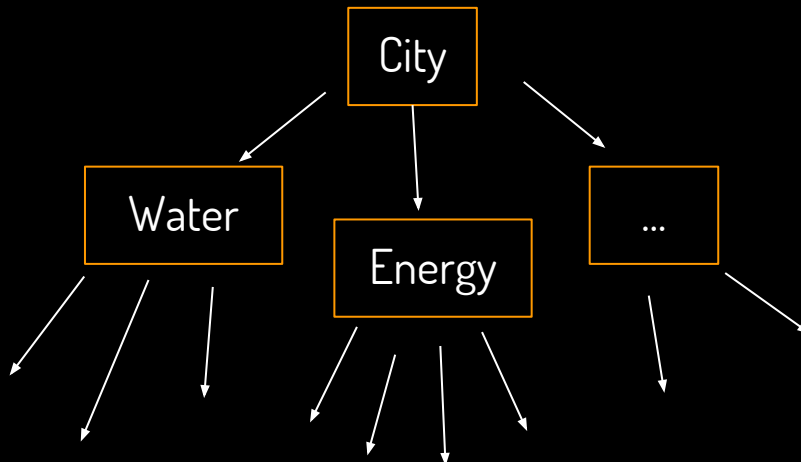
- socio-economics characteristics
- physical space properties
- other spatial phenomena

Urban phenomena of interest:

- energy
- water
- mobility
- morphology of the built environment
- socio-economic attributes
- tourism

Challenges

- Highly ***coupled subsystems*** of the City system
 - How to simulate them
 - How to make them communicate with each other
 - how to make information understandable
 - how this information affect other subsystems
- Double approach:
 - Define the City System of systems (set-up the system from the top)
 - Validate the City System structure while modelling its components (reshape the system from the bottom)



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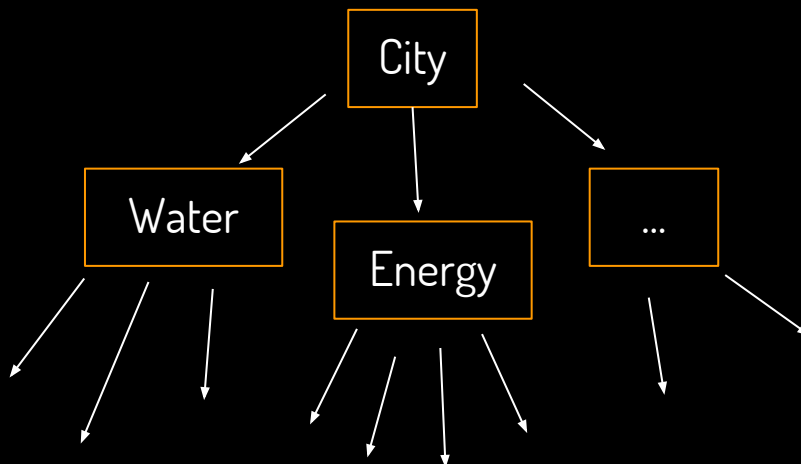
Water System - Are its subsystems strongly coupled?

- production
- distribution
- treatment

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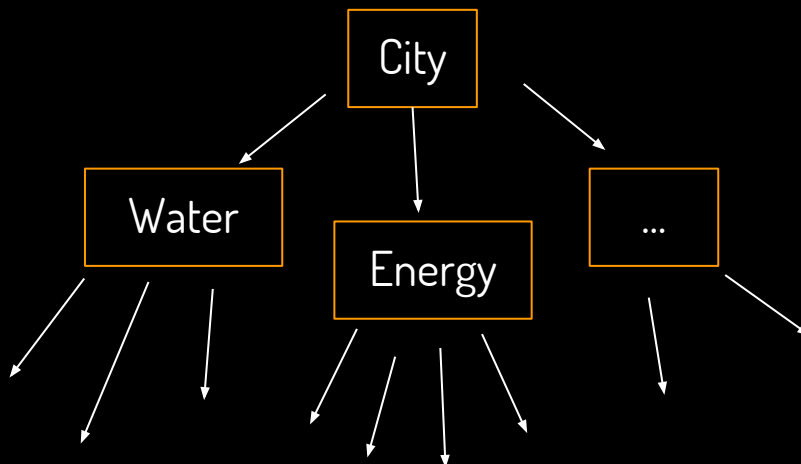
Water System - Are its subsystems strongly coupled?
...No...

- production (climate)
- distribution (city policy)
- treatment (laws)



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How to measure what people do?

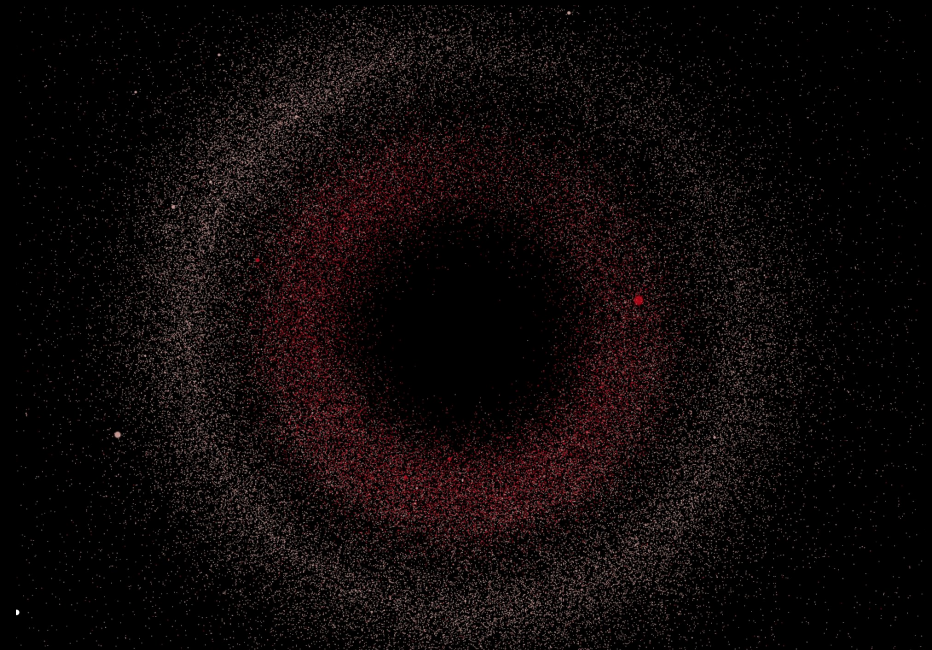
Project #Cuentalo

Tweets Analysis

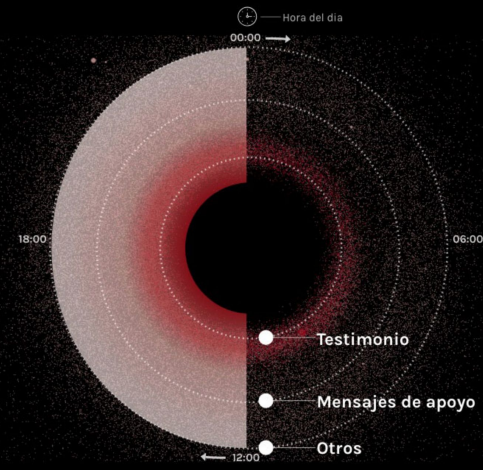
<http://proyectocuentalo.org/>

Project #Cuentalo

- Topic: Gender-based violence
 - 3 millions tweets in 10 days
 - 130.000 original tweets
-
- Supervised Learning
 - 10.000 tweets manually tagged (who, thematic)
 - Confidence Level:
Who: 70%
Theme: 80%



CÓMO LEER
ESTA GRÁFICA



La visualización muestra cerca de 130.000 tweets, clasificados con redes neuronales.

La **POSICIÓN** en el círculo representa el tipo de mensaje. De dentro hacia afuera respectivamente, es la certeza con la que el algoritmo los categoriza en Testimonios, Mensajes de Apoyo, y Otros.

El **COLOR** representa el contenido del mensaje, rojo para los que hablan de agresiones físicas (asesinato, violación, agresión sexual y maltrato), y rosa pálido para el resto.

El círculo se lee como un reloj de 24 horas, los Tweets se organizan según la hora en que fueron escritos.

Visualización hecha por BSC Viz Team del Barcelona Supercomputing Center.

Para más detalle sobre la visualización, visita nuestro [blog](#).

Virtual Social Networks

- Sentiment analysis (text, emoji)
 - Transport system satisfaction
(E. Graells-Garrido, D. Caro:
Transantiago users' perception)
- Automatically measure metrics from text
 - #CityBicyclePath,
 - #StataTrainNetwork
- Simulating how people interact
- Self-reported data
- Bias
- Written production
- Irony - Sarcasm

Thank you