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Smart environment e COVID: experiencias do uso do InterSCity em casos reais

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Smart Environment e COVID: Experiências do uso do InterSCity em casos reais

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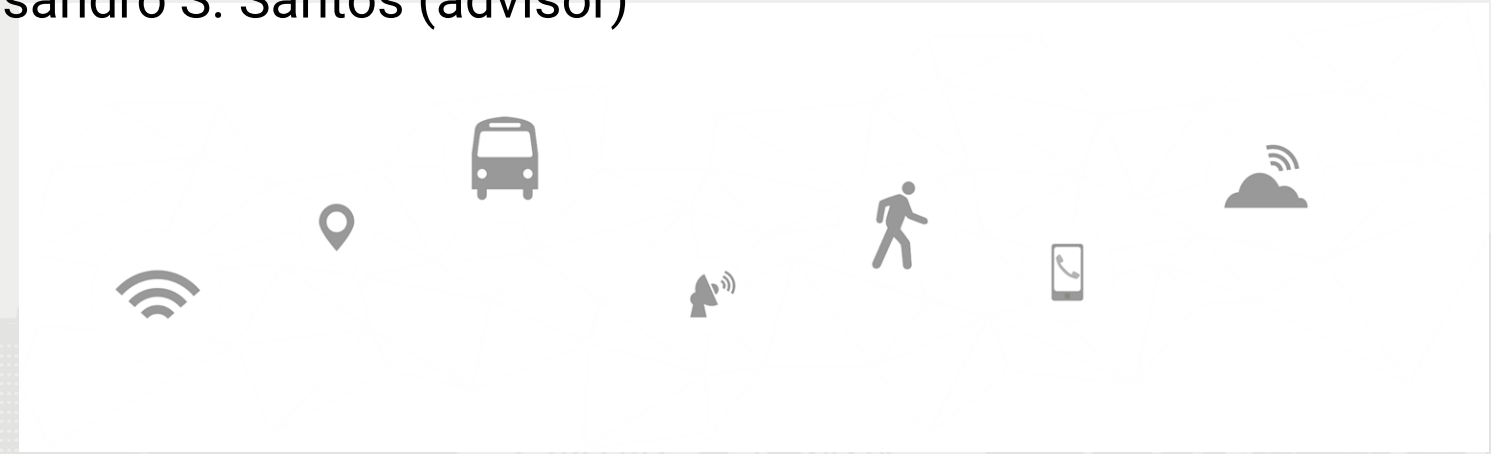
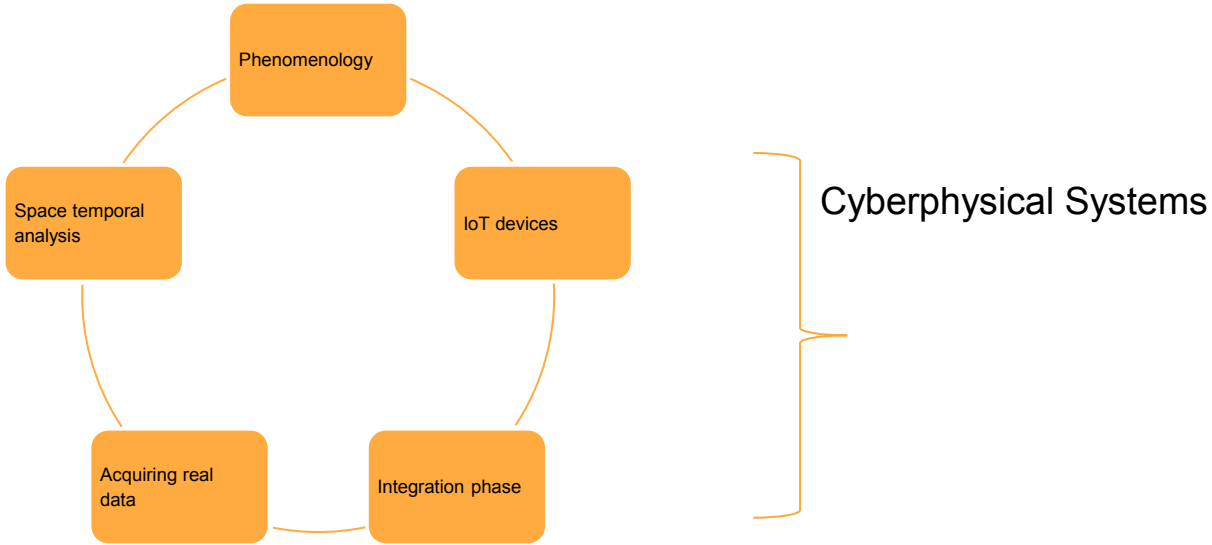


III Workshop INCT, May, 2020

Introduction

- Application of new digital technologies for monitoring and managing environmental pollution and natural disasters - focusing on the challenges and computational opportunities - must be integrated with phenomenology

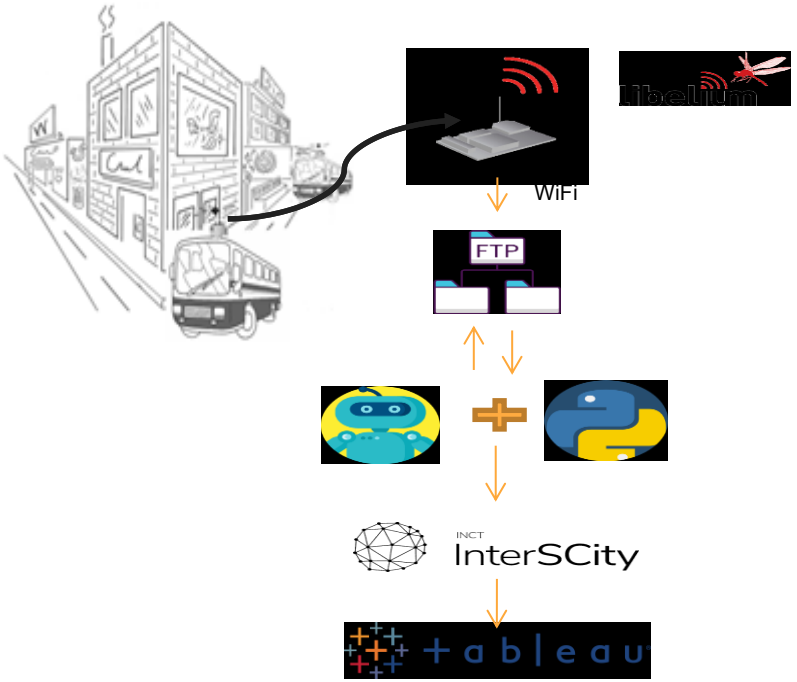


Smart Environment for Air pollution

- Target: Air quality Monitoring to increase quality of life by deployment of intelligent public polices

- Main Parameters
  - SO_2, NO_2, CO, O_3, MP
  - Temperature, air humidity, atmospheric pressure

- Technological approach



Results expected

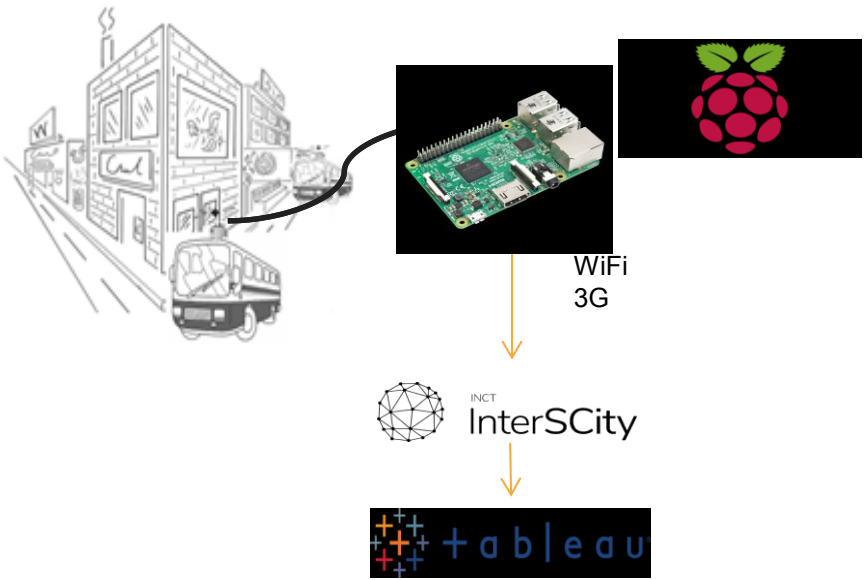
- Infrastructure to improve air quality monitoring systems
- Information to decision support for feet replacement by Eletric
- Policies evaluation for restricting urban transport vehicles (i.e. create exclusive region for electric vehicles)

Smart Environment for Sound pollution

- Target: noise monitoring to increase quality of life by deployment intelligent public polices

- Main Parameters
  - *Audio, pluviometry*

- Technological approach



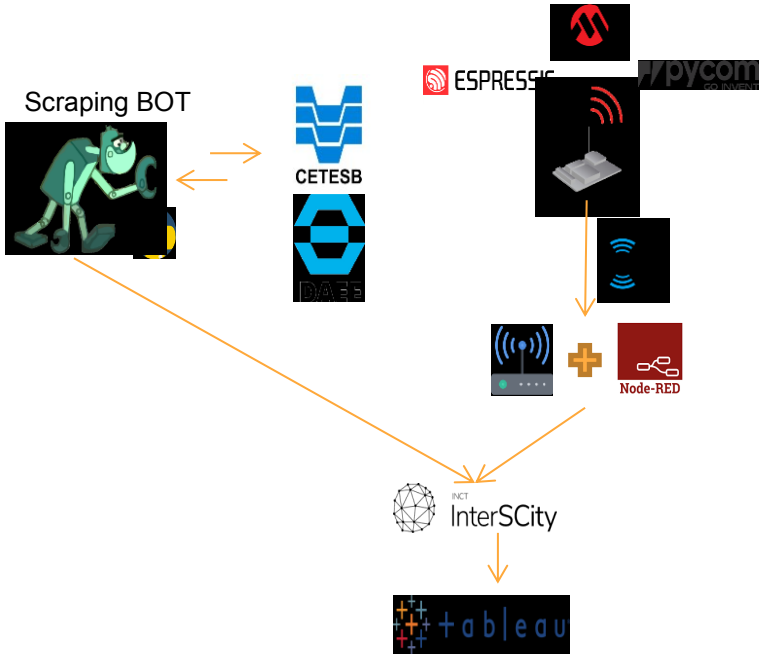
Results expected

- Create a noise map. Noise map is a graphic representation of the sound level distribution and the sound waves propagation in a given region for a defined period.
  - Barulhômetro (https://barulhometro.com.br/)

Smart Environment for Natural Disasters

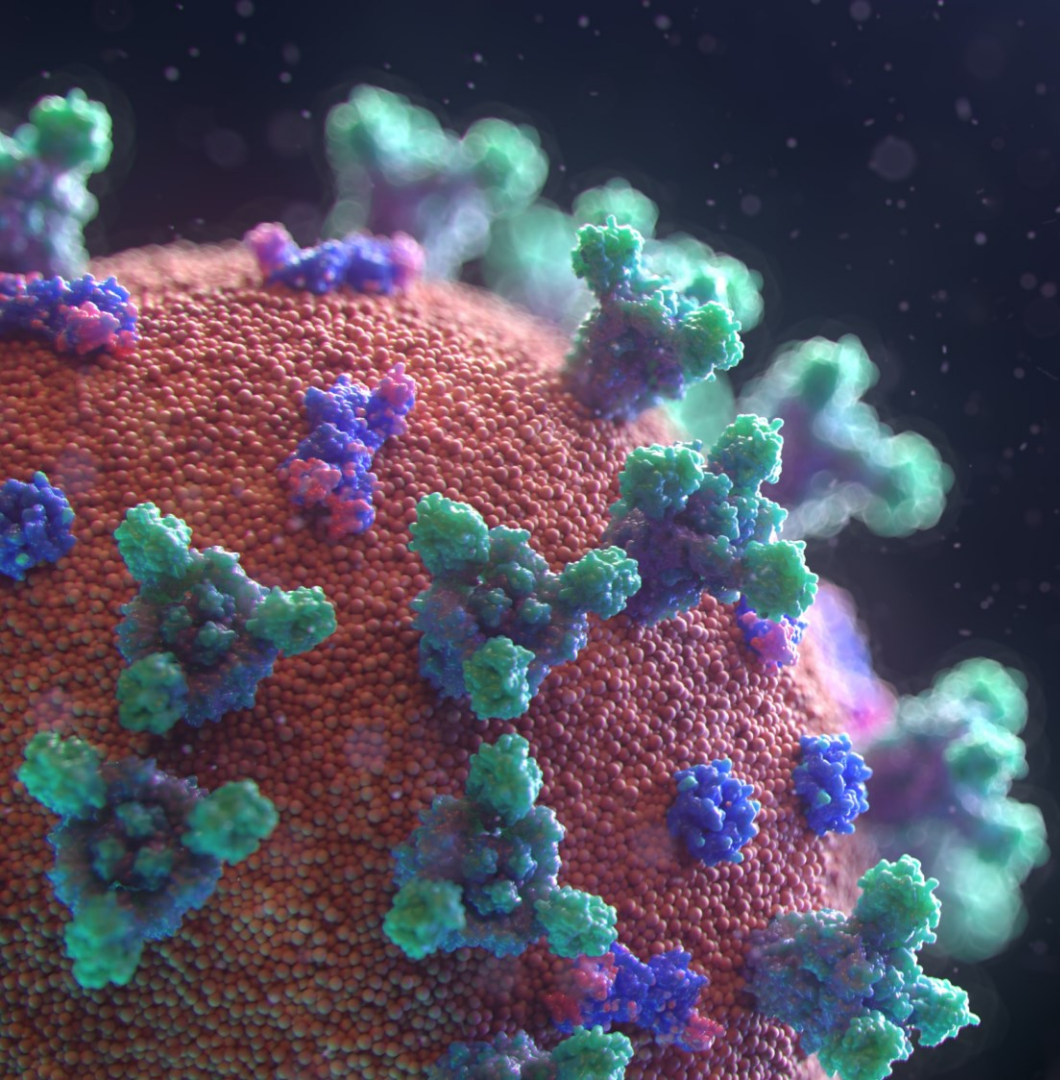
- Target:
  - For flooding: river flow and level to avoid economic damage and loss of life.
  - For landslide: rainfall data and displacement data.
- Main parameters
  - for flooding: *movement, pluviometry, air humidity, river flow and level data*
  - for landslide: *pluviometry, movement, temperature, air humidity, atmospheric pressure*

- Technological approach



Results expected

- Historical data can be used to generate accumulated rainfall values that trigger landslides and floods. Theses values are used to retro-analyze the events that have already occurred;
- Predict and real-time detect natural disasters avoiding economic damage and loss of life;



COVID

Worldwide Natural disaster

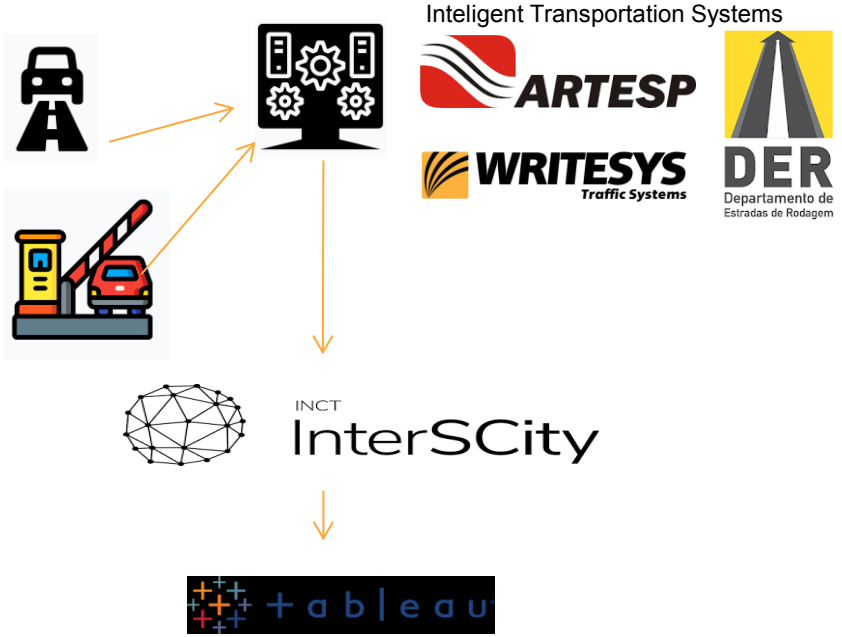
Using InterScity
for mobility monitoring

InterScity supporting Control Center for COVID

- Target: Rapid integration of IoT sensors and systems in transportation scenarios in São Paulo State

- Main Parameters
  - Traffic counters
  - Matrix O-D (Origin-Destination)

- Technological approach



Results expected

- Mobility monitoring for evaluate probability to spreading virus
- Today are 20.000 records by day enabling temporal and spatial analysis
- Online Matrix O-D for planning and support for supply chain scenarios

Improvements, lessons learning and conclusions

Improvements and lesson learnings

- Improvements
  - Persistent Docker Containers
  - Deny GET request with Nginx (Security)
  - Enable Replica sets providing redundancy and high availability in production deployment
  - Report bug
- Privacy requirements promote differents architecture to LGPD compliance

Conclusions

- Future works
  - Create a bot to collect the flow rate of the rivers from CEMADEN and DAEE sites;
  - Collect data of gases for analysis of vapor intrusion phenomenon from contaminated soils;
  - Apply Interscity to SMART GRINDING PLANT;
  - Improvements in Interscity:
    - Improve mongodb authentication

Thank you!!!

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