



CIRCIE 2019

Challenges for the Islands in the era of the Circular Economy



SmartWater2020: Innovative technologies to minimize the loss of water in Cyprus and Crete

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Under the auspices of



SMile 2019

6th Sustainable Mobility & Intelligent Transport conference





Challenges

- Background leakages which are hard to detect
- Increasing pipe bursts
- High percentage of non-revenue water
- Water quality & contamination risk
- Security and safety of the cyber/physical infrastructure
- Real-time monitoring
- Equipment and telecommunication costs
- Staff training





Intelligent Water Distribution Networks

Use of Communication and Information Technologies & Sensors and Control, in order to:

- improve the reliability of water distribution networks
- reduce water and energy losses
- reduce operating costs
- improve safety and security
- improve water quality
- increase the robustness of the system





Project Team



ΙΝΣΤΙΤΟΥΤΟ ΠΛΗΡΟΦΟΡΙΚΗΣ



SmartWater2020: Intelligent Water Distribution Networks for Reducing Loss

- Budget: € 907,000
- December '17 – June '20





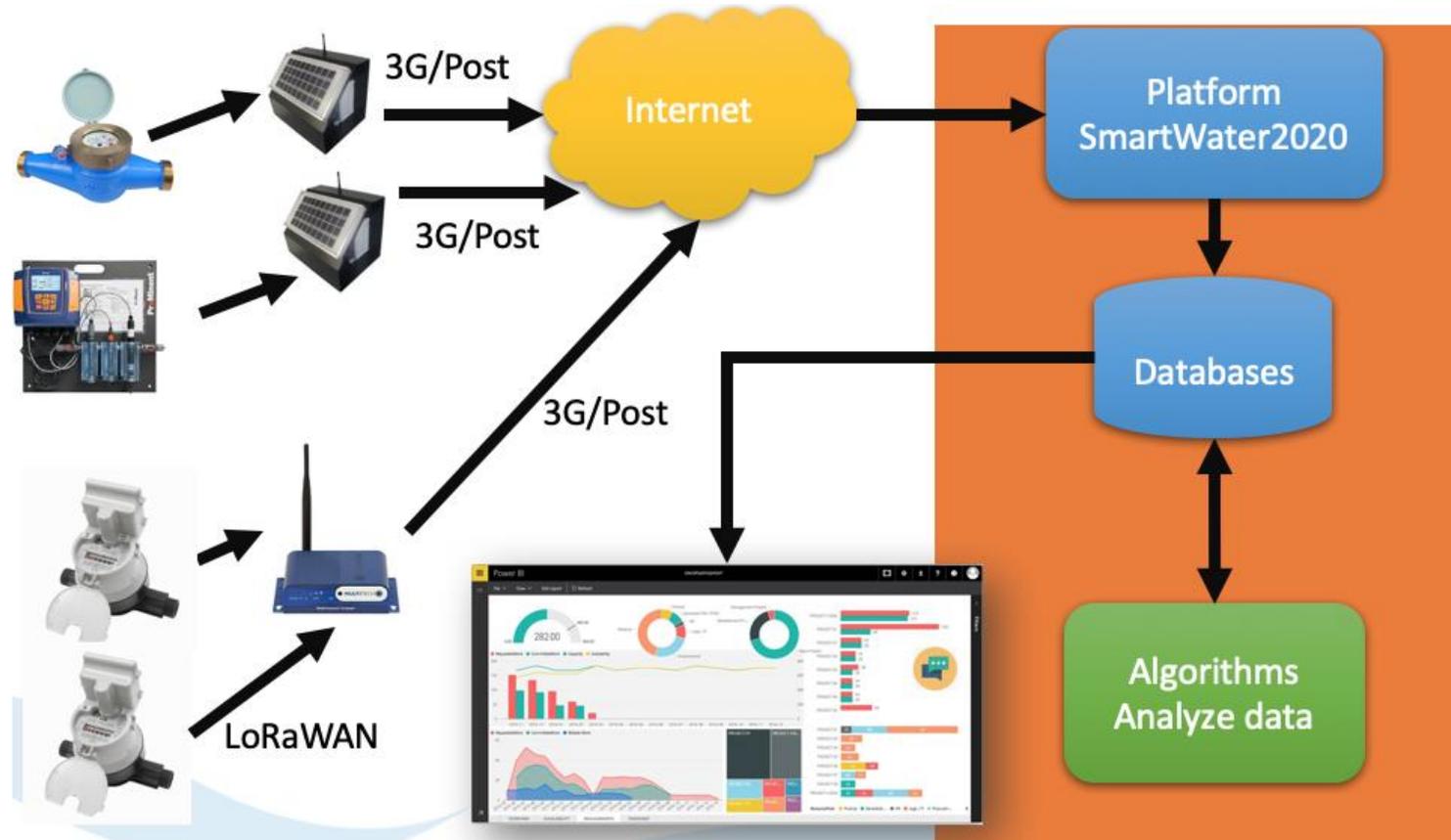
Expected Outcomes

- Installation of smart meters at WB Larnaca, WDD, DEYAM
- Installation of pressure and quality sensors in WB Limassol and WDD
- Installation of a pressure regulation system in WB Limassol
- LoRaWAN wireless platform evaluation at WB Larnaca
- Integrate with SmartWater2020 platform at KIOS
- Development and testing of innovative methods of data analysis
- Test innovative techniques to reduce telemetry costs and energy
- Creation of digital games to promote water awareness
- Staff training on intelligent water networks topics
- Creation of simulation tools for research purposes





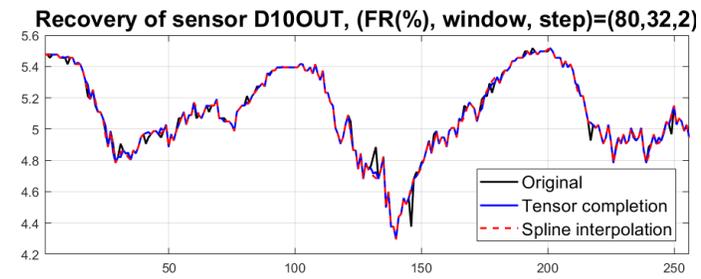
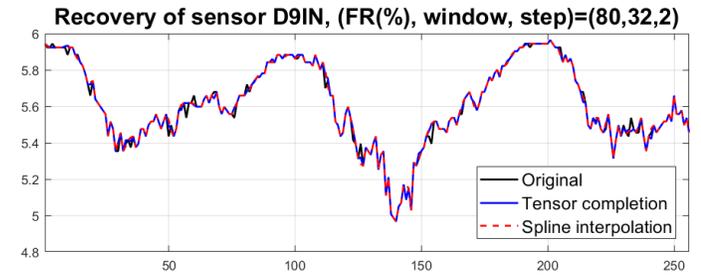
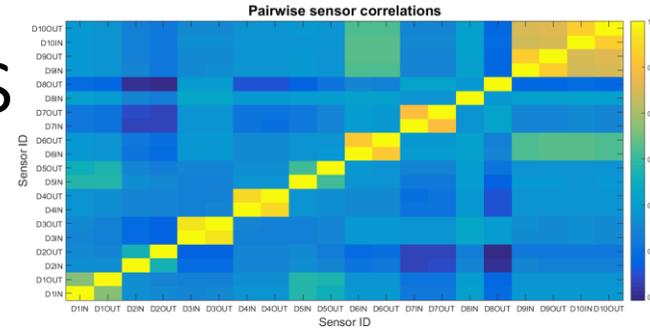
Systems Architecture





Intelligent Telemetry to reduce costs and energy

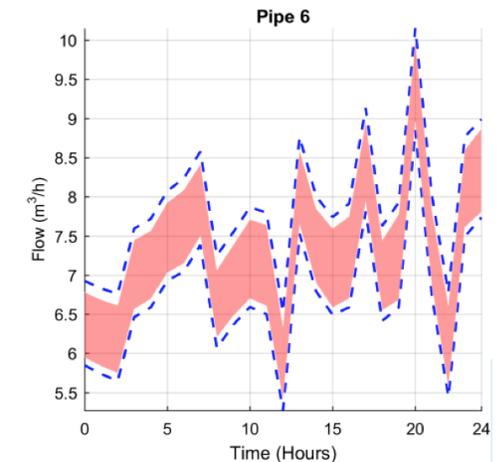
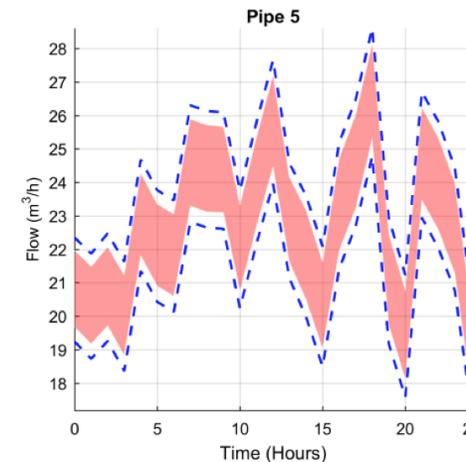
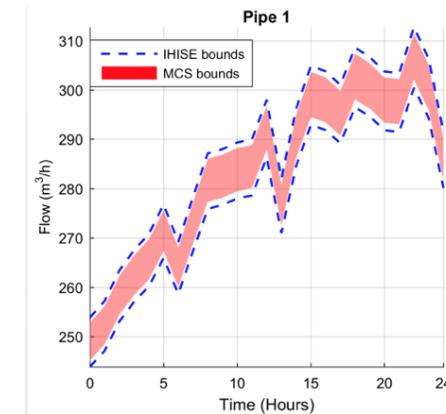
- Compressed sampling and data reconstruction
- Sensor correlation
- Missing-data recovery
- Super-resolution of sparse measurements
- Anomaly detection in sensor signals





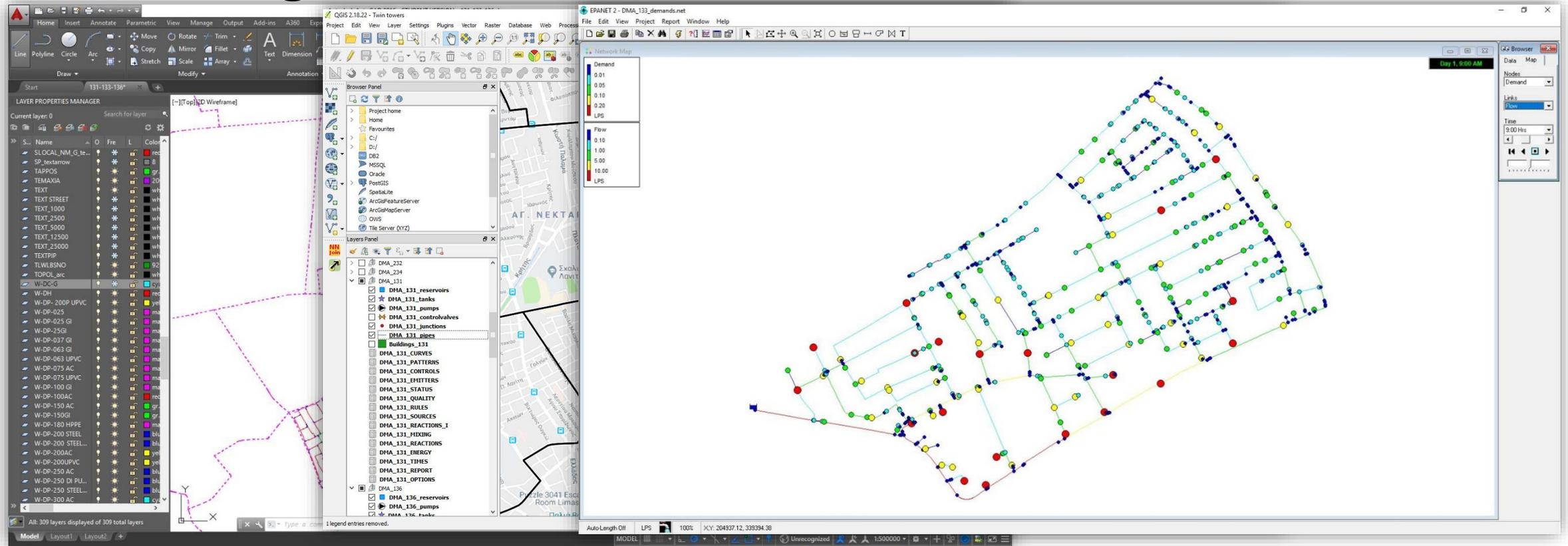
Intelligent Data Analysis

- Hydraulic / quality state estimation
- Pressure control with automated reduction valves
- Pipe burst risk assessment
- Leak Detection
- Sensor placement (pressure, chlorine sensors)
- Detecting changes in water quality





Modeling





Sensor Placement

Optimally install pressure sensors within a large area in order to maximize the ability to detect leakages





Sensor Placement is a Serious Game!

Μαρίος

Τι είναι αυτό;
SPLACE

Αυτό είναι ένα δίκτυο μεταφοράς πόσιμου νερού στη Λεμεσό. Στα δίκτυα μεταφοράς νερού, μπορούμε να παρακολουθήσουμε την ποιότητα του νερού με τη χρήση ηλεκτρονικών αισθητήρων, για την έγκαιρη ανίχνευση νερού αλλοιωμένης ποιότητας. Η αποστολή σας είναι: **Τοποθετήστε μέχρι και 5 αισθητήρες** στο δίκτυο. Στόχος σας είναι:

1. Να καλύψετε όσο περισσότερα σημεία παροχής νερού μπορείτε (κόκκινα οπίκτα).
2. Να μειώσετε το χρόνο που θα χρειαστούν οι αισθητήρες για να εντοπίσουν το αλλοιωμένης ποιότητας νερό. Έχετε δύο λεπτά για να διαλέξετε που θα τοποθετήσετε τους αισθητήρες.

Βοήθεια

Έναρξη Παιχνιδιού

Καταχώρηση

Έξοδος

GR EN

Κόστος
 Ακάλυπτα

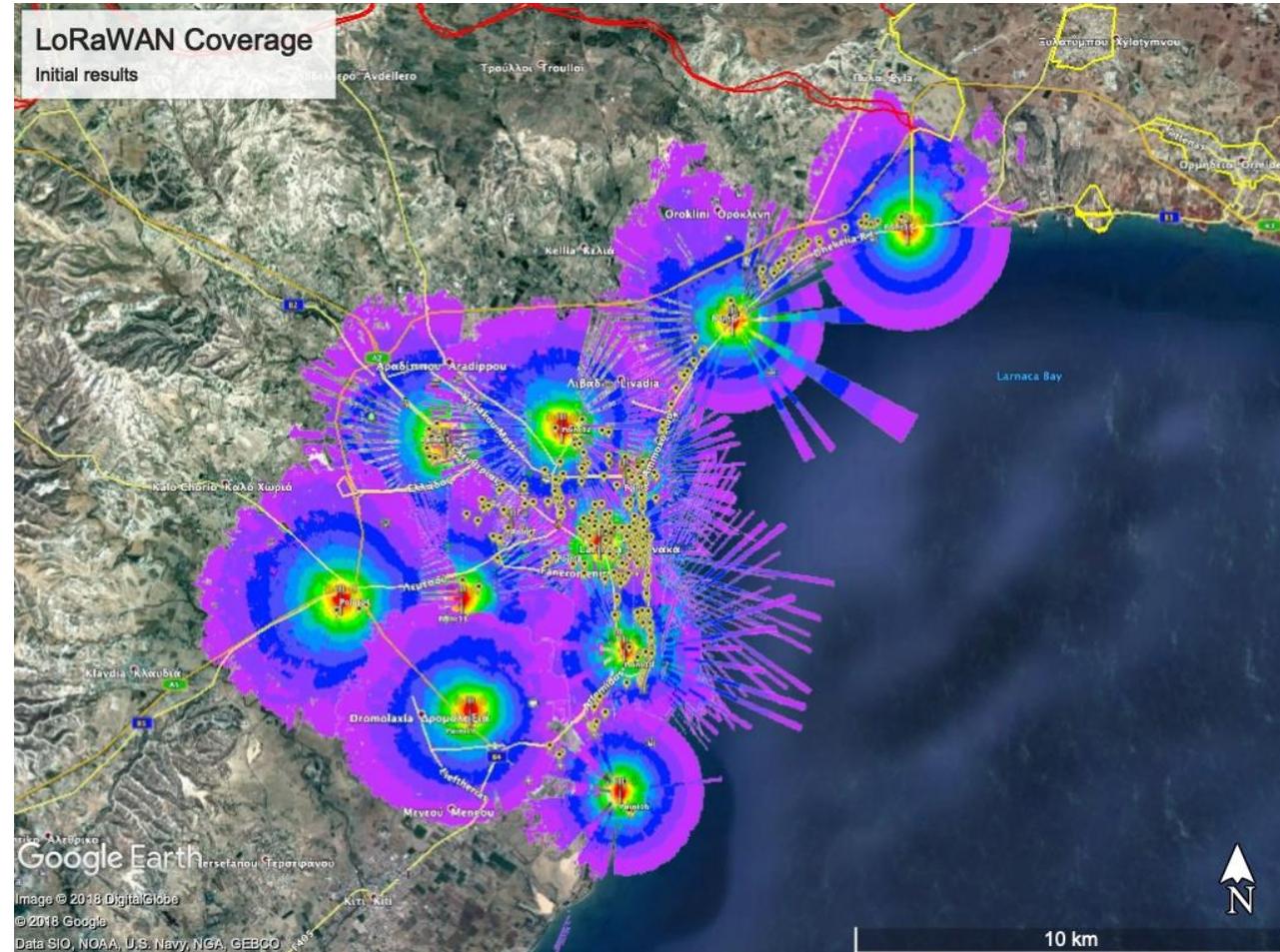
1 Μονάδα





Wireless Network for Smart Cities

Installing a city-wide
network, enabling
smart-city solutions





Next Steps

- Installation of smart meters, sensors and actuators
- Interfacing with telemetry systems
- Integration with SmartWater2020 platform
- Pilot system test to verify algorithms operation (e.g. leakage detection)
- Analyze results and integrate conclusions
- Organizing a workshop on Smart Water Networks.



Thank you for your attention

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