MÉXICO
GOBIERNO DE LA REPÚBLICA

CONACYT
Consejo Nacional de Ciencia y Tecnología

FUTURE INTERNET ASSEMBLY

Urban computing

Raúl ACOSTA-BERMEJO
Deputy Director
IPN-CIC

Athens, Greece, March 20th, 2014

MÉXICO
GOBIERNO DE LA REPÚBLICA

CONACYT
Consejo Nacional de Ciencia y Tecnología

Laboratories at CIC

- Micro-technology and Embedded Systems
- Communications and Computer Networks

- Digital Signal Processing
- Real-Time and Automation Technology
- Robotics and Mechatronics

- Database and Software Technology
- Geospatial Information Intelligent Processing

- Artificial Intelligence
- Natural Language and Text Processing
- Neural Networks and Unconventional Computing

- Modeling and Simulation

≈ 60 scientist
250 students

MÉXICO
GOBIERNO DE LA REPÚBLICA

CONACYT
Consejo Nacional de Ciencia y Tecnología

General information of the project

Urban computing is

- A process of acquisition, integration, and analysis of big and heterogeneous data generated by a
- diversity of sources in urban spaces, such as sensors, devices, vehicles, buildings, and human,
- to tackle the major issues that cities face, e.g. air pollution, increased energy consumption and traffic congestion.

- Multidisciplinary field:
  - Geomatics (geographic or spatially referenced information).
  - Mobil computing.
  - Social behavior.
- It is a disciple of
  - Gathering, storing, processing, and delivering,
  - A broad set of information.

Close concept
Smart cities
or project
iCity

MÉXICO
GOBIERNO DE LA REPÚBLICA

CONACYT
Consejo Nacional de Ciencia y Tecnología

Objectives

To tackle problems on:

- Urban informatics
  - Acquisition, aggregation, and analysis of big data.
  - Discovering regions (different functions, human mobility).
- Social computing (behavior)
  - Modelling Large-Scale Aggregated Human Behavior.
  - Understanding and patterns mining in urban spaces.
- Mobile computing
  - Mining data from Mobile devices
- Traffic System Infrastructure
  - Mining public transportation data.
- Urban monitoring
  - Environment/pollution/energy consumption, and data analysis.

MÉXICO
GOBIERNO DE LA REPÚBLICA

CONACYT
Consejo Nacional de Ciencia y Tecnología

Results

To define and build a prototype of:

- An open architecture for supporting smart cities.
- A common framework for developing services. Software & hardware.
- A use case (an application) that use the framework and architecture.
- The platform must have information security.

Like: FI-Ops, FI-Lab, FI-ware, Alien project (HAL)

MÉXICO
GOBIERNO DE LA REPÚBLICA

CONACYT
Consejo Nacional de Ciencia y Tecnología

Impacts

Improving the **quality of life**

- Environmental impacts.
  Air quality, noise pollution => (EAR-IT project, Smart meters)

- Traffic Management
  Reduce traffic congestion, reduce crowd (>120/20 millions)

- Adding or enhancing Information security (data & communications).
  To overcome crime informatics.

MÉXICO
GOBIERNO DE LA REPÚBLICA

CONACYT
Consejo Nacional de Ciencia y Tecnología

Opportunities to collaborate

Our strongest skills:

- Electronic device and components construction
  - FPGA, VLSI, MEMS-NEMS

- Computer networks protocols (MANETs, VoIP-SIP/RTP)

- Security information systems using:
  - Authentication , confidentiality (cypher), integrity.
  - Biometric systems (identification)
  - Protocols (SSL, SRTP).
  - NIST standards PKCS.

Mexican Armed Forces

- Operating systems (developing)
  - Hardening, recompiling.
  - Embedded OS (Android), new functionalities (DSP, SPI)

MÉXICO
GOBIERNO DE LA REPÚBLICA

CONACYT
Consejo Nacional de Ciencia y Tecnología

Conclusions

We can participate on:

- Research (JCR/ISI)
- Development (software factory, RUP/Scrum, roles)
- Project management (PMBOK).

Task force

MÉXICO
GOBIERNO DE LA REPÚBLICA

CONACYT
Consejo Nacional de Ciencia y Tecnología

Thank you!

Contact information

Raúl ACOSTA-BERMEJO
Instituto Politécnico Nacional
racostab @ { ipn.mx, mail.cic.ipn.mx }

MÉXICO
GOBIERNO DE LA REPÚBLICA

CONACYT
Consejo Nacional de Ciencia y Tecnología

Projects

-