



TITLE

Opportunistic Internet of Things for data collection: stochastic models and algorithms

KEYWORDS

Optimization, Stochastic Programming, Internet of Things

REFERENCES

Guido Perboli

RESEARCH GROUPS

Operations Research and Optimization Group (ORO GROUP)

TYPE OF THESIS

Applied, experimental

DESCRIPTION

The traditional view of Internet of Things (IoT) attempts to connect all the physical objects to build a global, infrastructure-based IoT. In this thesis we will consider opportunistic IoT, which is formed based on the ad hoc, opportunistic networking of devices (e.g., mobile phones and smart vehicles) using short-range radio techniques (e.g., Bluetooth and Wi-Fi) in the Smart City context. In fact, the Smart City paradigm requires, in order to be declined in factual projects, to gather data from a distributed network of sensors (e.g., trash bins, heat sensors, sensors for smart building and energy applications). Unfortunately, the coverage of the available hubs and hotspots might be not sufficient to cover all the urban area. Thus, it becomes crucial for the IT company managing this process to use as mobile hotspot the devices of selected users (e.g., the mobile users) in order to collect the data. On one hand, the choice of the users and the policy to push them to be part of the process is a tactical decision, valid for a given time horizon. On the contrary, the day-by-day data retrieval process is uncertain, being the data retrieval process connected to the movements of the user or environmental factors, causing a degradation of the data retrieval process.

Aim of this thesis is, starting from the real setting, to define a representation of the problem as stochastic model and to design the proper solution methods.

Notice that, if the results of the student will be considered of good quality, he/she will be considered for a **PhD position** funded by the Joint Open Lab of Telecom Italia **starting in October, 2016** on the same topic of this thesis.

REQUIRED EXPERTISE

Knowledge in Operational Research field

Programming skill (es. C++, Java)

PROPOSAL DEADLINE

The students interested in the thesis should submit their application by sending their CV, the mean grade and the number of modules to pass by September, 6th to prof. Guido Perboli (guido.perboli@polito.it).