Internet of Things Benchmarking
Master 2 Research Internship Proposal

Start date: February 2015
Duration: 6 - 8 months
Location: LIP6 / UPMC, Paris

Description:
In the context of a two year R&D project, UPMC/LIP6 is hiring interns for participating in the validation and extension of an existing Internet-of-Things platform (OpenIoT) for new SMART environment applications. IoT is tightly coupled to many concepts including SmartCity, SmartTransport, SmartEnergy, SmartFarming, etc., all being representatives of sectors hoping for increased effectiveness and efficiency by adding ICT supported sensing and actuating capabilities to their environment. Deploying IoT in large scale still encounters various issues both on technical and non-technical dimensions. The goal of this internship is to study the problem of evaluating an existing IoT platform (OpenIoT) developed by Fraunhofer IOSB, Karlsruhe with respect to different application scenarios of different scale and complexity. This study includes different dimensions (technology, economy, society, legal), but will mostly concern the definition and practical evaluation of service and data related metrics (interoperability, performance, ...).

Expected contributions:

- State-of-the art on IoT benchmarking and evaluation (report)
- Definition of a technically oriented benchmark based on one or two Smart-application scenarios (report)
- Implementation of a benchmark simulator (software)
- Evaluation of the OpenIoT platform using the benchmark simulator (experimentation and report)

Expected profile:

- Strong software engineering skills and practical experience in programming (preferably Java) and in at least one of the following subjects: databases, knowledge management, semantic web technologies, ontology design
- Capacity to understand new concepts and to work independently.

Contacts:

- Bernd Amann Bernd.amann@upmc.fr
- Christophe Marsala christophe.marsala@lip6.fr
- Volker Tippmann Volker.tippmann@zv.fraunhofer.de

Bibliography:

[2] Le Gall, F.; Chevillard, S.V.; Gluhak, A.; Zhang Xueli, "Benchmarking Internet of Things Deployments..."
The Research Institutions:

The LIP6 Laboratory of Computer Sciences, Paris (www.lip6.fr) with a staff of 470 people including 170 permanent researchers, 250 PhD students, Postdocs, engineers and administrative employees is today one of the most important centers of Computer Science in France. LIP6 is part of the Université Pierre et Marie Curie and as a department of CNRS (UMR 7606), it is also linked to the INS2I (Institut des sciences de l'information et de leurs interactions). The LIP6 laboratory is composed of 20 research teams structured into 7 departments which cover a wide spectrum of computer science domains: scientific computing, decision making, optimization problems in artificial intelligence and operational research, databases and machine learning, networks and systems, systems on chips, complex systems.

The Fraunhofer-Institute for Optronics, System Technologies and Image Exploitation, Karlsruhe (IOSB, http://www.iosb.fraunhofer.de) has 440 permanent employees, of which 282 are scientists or engineers. IOSB is situated in Karlsruhe, Germany and develops innovative concepts and application solutions in information technology in various business units such as automation, energy, water and environment, defense, security and automated visual inspection. Fourteen departments and one research group, which acts as a link to the Chair of Interactive Real-Time Systems of the Institute for Anthropomatics at the Faculty for Information Technology at the Karlsruhe Technical University, represent the variety of competences at the IOSB.