

Student/Intern project**Fault Tolerance Analysis of IoT devices in smart cities**

Smart Cities are augmented environments capable of utilizing the Internet of Things (IoT), in which computational intelligence is ubiquitous to provide people with contextual, proactive and personalized services. These environments will provide ubiquitous information and services to promote well-being as well as better management of the city's resources.

An IoT framework is being developed at AMI-lab to promote better delivery of services in Smart Cities. We mainly target helping aging people to lead an independent and purposeful life, through ambient assistive technologies. The framework includes software components to integrate context from IoT devices. These components implement diverse protocols (e.g., Zwave), and include processes to persist and interchange context. Our platform similarly manages emerging protocols providing context outdoor (e.g., Bluetooth low energy, Beacon) as well as technologies providing services (e.g., IoT services, cloud computing). All context and services are integrated, pre-processed and kept in a knowledge base (NoSQL/big data technologies), to be consumed through the city.

Our team has also deployed diverse IoT devices in the city of Sherbrooke (e.g., sensors, actuators). We are also currently extending our platform to include various outdoor technologies in order to provide a solution that integrates a large number of IoT objects (i.e., smart objects through kiosks and smartphones). Therefore, a tool that enables automatic processing of the IoT devices is required for efficient analysis. Recent advances in language technologies/machine learning are promising and enable to gain useful insights from the IoT gathered data.

Keywords

Smart City, Internet of Things, Big data, REST API, Android, Swift Sensors & Beacons, Dynamic and adaptable systems, Context aware services, Real life deployment.

Required skills/background

- Strong motivation towards challenging projects
- Skills in machine learning
- Ease in programming
- Recommended skills in Linux, embedded systems (Raspberry PI, Arduino, etc.)
- Recommended skills in Web services
- Recommended skills in Android

Role of the student/Intern

The student/intern project mainly involves the design of a fault tolerance analysis solution that enable managing remote IoT devices. The student/intern will be working on the implementation of a prototype that ensures a follow-up of real remote IoT devices we deployed in our city. The student/intern may use algorithms of machine learning to automatically provision, configure, detect failure in our devices.

Application

Interested applicants email a detailed CV, transcripts and motivation letter to the lab director. The successful candidate will be contacted shortly after processing the received applications.