

Septembre 2020

Student / Intern project
IoT platform for 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 nodes. These components implement diverse protocols for smart houses (e.g., Zwave, Bluetooth Low-Energy, Beacon), and include processes to persist and interchange context.

Nowadays, diverse new technological components (e.g., sensors, actuators, cloud) have been deployed and new protocols are emerging. These protocols facilitate the evolution towards using technology in everyday activities. Therefore, we are 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 gateways and smartphones). Our platform similarly manages emerging protocols providing context outdoor (e.g., LoRa, 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 (Big data technology), to be consumed through the city. The design incorporates design patterns and optimization of algorithms in order to deploy in nodes through the city, with small computation capacities (i.e., processor, memory).

Keywords

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

Required skills/background

- Strong motivation towards challenging projects
- Recommended skills in Web services
- Ease in programming (mainly C++, Python, Java, etc.)
- Recommended skills in Linux, embedded systems

Role of the student/Intern

The student/intern project mainly involves the integration of new protocols in real setting (with real) devices in order to complete the implementation and performing tests. The student/intern will be involved in analyzing emerging technologies and protocols for smart cities. He also will work on the design and development of an extension of our platform to manage heterogeneous technologies.

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.