

MSc student/Intern project**IoT based Learning from activities 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.

Ambient intelligence services have been successfully deployed in smart cities for providing computational support in pre-defined people activities (e.g., a guided museum visit). For unknown situations, the available support differs from pre-defined ones, and the support reaches a high level of uncertainty in the computational system. Then, diverse user interventions are required by the system to determine the appropriate correlation between situation and activity. As a result, ambient intelligence systems require an approach to update pre-defined activities in order to minimize user interventions.

In our research work, we are developing applications for supporting non-technical users (i.e., elderly people) in everyday activities. These users demand ambient intelligence support with a minimal interface because they cannot configure a computational system as a technical user. Furthermore, we need to address unknown situations of pre-defined activities by correlating with similar situations, past experiences and current context. Therefore, we need to provide the means for learning from successful tasks (i.e., goal-achieved tasks belonging to an activity). The aim of the project is to minimize user interventions in everyday activities by using machine learning mechanisms.

Keywords

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

Required skills/background

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

Role of the student/Intern

The student/intern will research available machine learning mechanisms and select appropriate algorithms that enable an incremental learning from tasks. Subsequently, the student/intern has to implement a prototype which includes the selected algorithms and interchange data with our applications in order to correlate situations. For testing purposes, the student/intern will configure a scenario and generate multiple cases with variant tasks of an activity. Finally, the student/intern has to provide a paper-style report of the challenges in the proposed approach.

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.