

### Presentation of the project

Making use of the transition towards ubiquitous environments where embedded computing devices seamlessly integrate and cooperate to serve human needs, we can design systems specially fitted to provide care to the ageing population. At IPAL, the UbiSMART framework is being developed to help the elderly lead an independent and purposeful life, through ambient assistive technologies. Therefore, we build smart spaces where sensors are deployed and reasoning algorithms implemented to gather knowledge about users' context. This knowledge can then be used to provide real-time services, as well as lifestyle assessment and coaching. The project incorporates research thematic including nomadic service discovery at home and in urban environments. We are currently packaging our system as a "smart home in a box" kit where a home gateway (1) pushes sensor data to a cloud-based platform where it is processed by server-side applications, and (2) provides the necessary subscriptions and configuration tools to access the cloud services.

### Expected deliverables

This internship will lead to the design and development of a BeagleBone-based home gateway integrating a wireless communication module for the communication with sensors and activators (e.g. ZigBee, X10). It will act as gateway between the local hardware on binary protocol and the cloud platform accessed over a REST link. It will also perform light pre-processing of the data and centralise all the configuration processes needed to setup an environment. Some sensors will be prototyped on Arduino Uno and integrated.

### Keywords

Ambient Assisted Living, Smart Home, Home Gateway, Wireless Sensor Network, REST.

### Applicant profile

- Master Degree or Engineer Student (last year of studies).
- Skills in Linux, embedded systems (Arduino, etc.) and ease in programming.
- Strong motivation towards this challenging project.
- Availability for 5 to 6 months starting in the first semester of 2014.

**Gratification:** About 800€ net per month



Image & Pervasive Access Lab  
1 Fusionopolis Way  
#21-01 Connexis, South Tower  
Singapore 138632

Tel. (65) 6408 2542  
Director. (65) 6408 2536  
Fax. (65) 6776 1378

secretariat@ipal.cnrs.fr  
www.ipal.cnrs.fr