

Ph.D. topic 2015

*Context Awareness and Wellbeing in Urban Assisted Living:  
Application to connected car jointly with PSA Peugeot-Citroën*

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### Presentation of the Ph.D. topic

*This PhD topic will be industrially driven through a direct collaboration with PSA Peugeot-Citroën Group in Singapore.*

Context-aware systems have been used in different domains in order to guarantee end-users' safety and quality of life. A predominant use case for context-aware systems is Ambient Assisted Living (AAL), which aims at helping dependent people with chronic diseases and age-related pathologies by providing customised personalised and continuous care assistance, dynamically adapted to their individual needs. For this purpose, we have been developing the UbiSMART framework for semantic rule-based systems to infer users' behaviours and based on that provide personalised services for supporting autonomy of the users.

The project proposed by IPAL, jointly with PSA Peugeot-Citroën, is to provide a number of innovative services to assist people in their daily car trips based on existing means of communication. The idea is to build a hardware and software infrastructure enabling the continuity of home-based services using the car as a "Mobile Hub" for services related (among others) to health and quality of life. This would increase the living space of people, even frail ones.

### Expected deliverables

The goal of this PhD proposal will be to explore and validate semantic rule-based approaches to ensure the continuity of context-aware services from smart homes to smart cities via a connected car. It leads the evolution of the UbiSMART framework towards service provisioning in smart cities. Data collection and performance tuning of the framework will be carried out as the next step, to improve its reliability, scalability, robustness and ability to combine context data gathered from the house and car to provision personalised care services in both environments based on the inferred user's activities. At short term, we are expected a contribution in the following topics:

- Data Design: Describe the ontological framework (concepts network), in which the information will be collected and projected (preliminary step necessary for building a customised health database), identifying data (with their creators and their users) and the processes for data processing, storage, query, visualisation, etc.
- Sensing Roadmap: Review existing sensors and sensors being developed by the partners of IPAL and PSA Peugeot-Citroën.





- Infrastructure Planning: Deliver an information flow diagram (places and creation processes, control, use) using relevant software tools for the architecture of information systems.
- Site Pilot Planning: Leverage on French and international mobility experiences in the city (Lyon, Bolzano in Italy, Rochester and Miami in the USA, Taiwan, etc.) to establish a reference pilot site in Singapore.

#### Keywords

Ambient Assisted Living, Context Continuity, Semantic Web, Smart Cities, Smart Homes, Connected Car, Service Delivery, Service Continuity.

#### Applicant profile

- Master Degree or Engineer Student (last year of studies)
- Skills in programming, REST, JavaScript and server-side application, node.js.
- Strong motivation towards this challenging project.
- Open to work with both French and Singaporean scientists.
- Affinity for industry-lead research.
- Availability starting first semester of 2016.

**Gratification:** Compliant to French Regulation on Ph.D. students (3 years Contract doctoral)

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