

Proposition de sujet de M2R

Toward a Context-Aware and Automatic Evaluation of Elderly Dependency in Smart Homes and Cities

Responsables :

- . Roose Philippe, Philippe.Roose@iutbayonne.univ-pau.fr
- . Laborie Sébastien, Sébastien.Laborie@iutbayonne.univ-pau.fr
- . Tayeb Lemlouma, Tayeb.Lemlouma@irisa.fr

Description du sujet

According to the United Nations projections, in 2050, the old-age dependency ratio of the population aged 65 years or over will approximate 51,70% of the population aged 20-64. For instance, this ratio will approximate 48,2% in France, 62% in Germany and 44,10% in UK. In healthcare domain, the evaluation of the autonomy or dependency of a person is of high importance. Indeed, such evaluation is used by the professionals of health to identify the person's needs of assistance, services and allowance. Also, it allows making the right decision about keeping the person in the health institution, nursing home or independently at home with or without healthcare monitoring. In a smart home environment, and more globally in a smart city environment, particular attention and care should be made for dependent people in particular for elderly since they are left on their own at home or in the city. A continuous dependency evaluation is of high concern since it can detect the changes regarding the person's abilities to achieve elementary daily tasks. In this work, we propose a framework for automatic and flexible dependency evaluation that can notify any changes of the elderly dependency and hence allows providing him, at time, with required help, assistance and allowance. We consider the heterogeneity of elderly profiles and service sources that can come from anywhere from the home or the city. The dependency evaluation takes benefits from the description model of the elderly and the dynamic composition of services. Our approach considers the activities of daily living (ADL) as used in the French AGGIR (*Autonomy Gerontology Iso-Resources Group*) model.

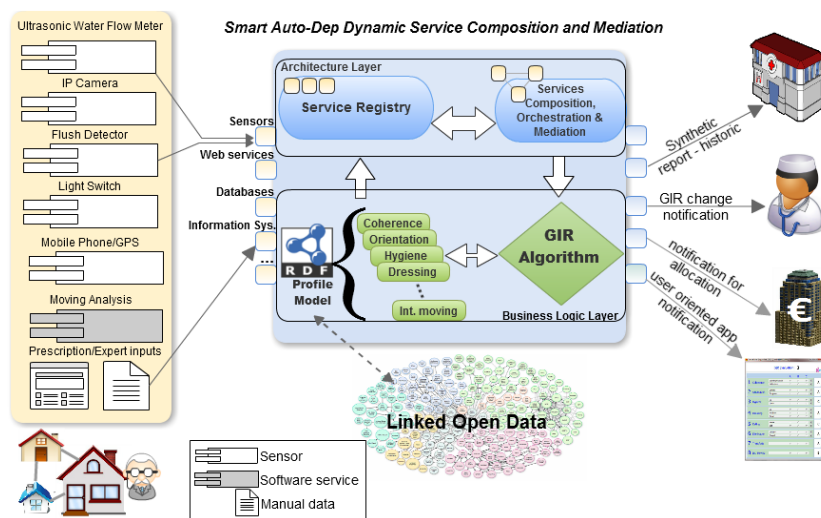


Figure 1 ADL oriented architecture

The objective of the application is to make automatic the dependency evaluation process which is usually done manually in the medical field. We focused on the dependency change within the medical AGGIR model, and possibly other existing models regarding the dependency in ADL of elderly and dependent persons. Our aim is to

move the current situation toward a flexible architecture and an extensible model linked to opened data referring to a wide variety of services (Figure 1). The different observation sources, sensors and services are heterogeneous and can come from anywhere in the home or the city. These services evaluate the different variables that affect the ADL. Consequently, the proposed architecture should be able to detect automatically the dependency situation and changes of the monitored person and notify these changes, in time, to different destinations (e.g. locally to a human interface, to the referring doctor, hospital, nurses, allowance institutions, etc., see figure 1).

In the current status of this subject, we have modeled the dependency changes from a dependency group to the lower group and identified priority variables for the dependency change according the context of the elderly (i.e. the GIR group defined in the AGGIR model). We described our vision of the flexible architecture (Figure 1) which has to integrate various sources (services, sensors and data) using mediation tools (e.g. Cilia) and notify the dependency changes.

The candidate has to develop the proposed RDF model, exploring other dependency models, study the extension of existing dependency evaluation algorithms (e.g. the extension of the GIR algorithm with heterogeneous sources) and the experimentation of dependency changes with real heterogeneous sensors and services composition. **The amount of scholarship is 437 €/month.**

Technologies utilisées

Services web (REST), Cilia, RDF, OWL
