

Internet of Things for Health and Medical Technologies

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Description of the scientific aims

The team has developed technologies for the Internet of things that enable efficient sharing and interoperability of data between applications and devices. Interoperability (i.e. how to connect two devices and transfer data between them) is currently seen as the major obstacle for growth of IoT technologies. The challenges are scientific (knowledge representation), technological (energy efficient protocols), and commercial (how to standardize). The team bases its research on semantic web technologies, and has developed an energy efficient platform for data interchange, and a programming approach for developing applications on the platform. The team has applied the developed tools and methods to improve work-processes in Hospitals and to several applications in the area of human activity recognition.

Selected publications 2010-

1. Hanna Pirinen, Lotta Kauhanen, Riitta Danielsson-Ojala, Johan Lilius, Ilona Tuominen, Natalia Díaz Rodríguez, Sanna Salanterä, *Registered Nurses' Experiences with the Medication Administration Process*. *Advances in Nursing* 2015, 1–10, 2015.
2. Natalia Díaz Rodríguez, Olmo León Cadahía, Manuel P. Cuéllar, Johan Lilius, Miguel Delgado-Calvo-Flores, *Handling Real-World Context-Awareness, Uncertainty and Vagueness in Real-Time Human Activity Tracking and Recognition with a Fuzzy Ontology-Based Hybrid Method*. *Sensors* 14(10), 18131–18171, 2014.
3. Natalia Díaz Rodríguez, Manuel Pegalajar Cuéllar, Johan Lilius, Miguel Delgado Calvo-Flores, *A Fuzzy Ontology for Semantic Modelling and Recognition of Human Behaviour*. *Knowledge-Based Systems* 66, 46–60, 2014.
4. Natalia Díaz Rodríguez, Manuel Pegalajar Cuéllar, Johan Lilius, Miguel Delgado Calvo-Flores, *A Survey on Ontologies for Human Behaviour Recognition*. *ACM Computing Surveys* 46(4), 1–32, 2014.
5. Natalia Díaz Rodríguez, M. P. Cuéllar, Johan Lilius, Miguel Delgado Calvo-Flores, *Semantic and Fuzzy Modelling of Human Behaviour in Smart Spaces. A case study on Ambient Assisted Living and Remote Rehabilitation*. In: R. Bailón-Moreno (Ed.), *I Congreso Nacional Multidisciplinar de Jóvenes Investigadores, I CNMJI (The National Multidisciplinary Congress of Young Researchers)*. Granada (Spain), 346–346, <http://hdl.handle.net/10481/32082>, 2014.