Projects and demo

Indoor location. Beacons Location Application

Through the utilization of bluetooth LE devices and a mobile application, a person can be detected inside a building. In our case we have used Estimote beacons, a Smartphone with Android operating system and an application capable of detecting the different beacons for this task.

Real-time monitoring

The application to monitor ambient intelligence environments allows to see the sensors status distributed in an intelligent environment. This application can have views of different environments, review the event history occurred in the sensors, create new environments, move sensors from sites, export event log dataset for a period of time, etc.

Subscription to events in a smart environment

This application allows us to receive a notification on a Smartphone in real time when an event occurs that produces a state change in one or some sensors. The application is designed for Android devices and sends notifications from a monitoring service installed in the laboratory.

Home environment adaptation according to the user's daily routines

This application allows us to create time routines so that the environment of the house (lighting, sound, et.) adapts to our needs. For example, if we would like that an older person to know that the time to go to sleep is at 23:00, we could create a routine so that the lights start to dim and play relaxing music at that time.

Guide to the use of electrical appliance with NFC technology

This application allows us to view videos associated to an activity on a Smartphone or tablet. For this task, when a Smartphone or tablet is close to the NFC sensor which contains the video URL, the application automatically plays the demo video on the Smartphone or tablet.

Remote control of cameras, lighting and audio at home

This application allows us to control cameras, lights, and audio of our home with a Smartphone or tablet. It’s possible to move the cameras to other places in the home, turn on or turn off the lighting and the audio equipment whenever.

Home Security

This application allows us to receive a photo of the place where we have the camera installed when the presence sensor detects movement in the place. How it works:

Automatic door opener for the SmartLab

This application allows us to automatically open the laboratory door using our Smartphone. The service implemented with beacons detects the proximity to a registered Smartphone, and validate it and, if it’s allowed, then opens the door. It works at a distance of approximately 3 meters.

Human-machine interface in a smart environment

Dissertation dedicated to manage smart environments.

Recipe Information Retrieval System (SRIR)

The Information Retrieval Systems (SRI) are information systems that are in a structured and stored form contained in databases made up of documents that process user queries, facilitating access to information. The SRI is made up of basic operations implemented in different ways on the documents that are stored, such as the introduction of new documents, the modification of stored documents and their elimination.

Our application is based on a recipe information retrieval. How it works:

- The user makes a voice query in natural language to the system.
- The system searches in the document database.
- The system calculates a ranking to know the most relevant document based on the user's query.
- The document with the highest ranking is shown to the user via voice.

The application has been made in Phyton (programming language). The framework used is Flask. Whoosh is the featureful full-text indexing and searching library used. The ranking function used in information retrieval is Okapi BM25. This function allows to sort by relevance the documents that contain words consulted by the user.

Simulation application software for help in intra-urban management

Nowdays, the term Smart City is well known and puts together different concepts around the management of a city. This application with a similar running than a video game allows us to make decisions in the intra-urban mobility, for example: traffic control, energy conservation, public/private transport or technological systems that allow an intelligent communication of the entire ecosystem. This application can be useful to design and form an arrangement for public transport, place new facilities, control traffic, simulate the mobility of agents using a

specific artificial intelligence, or even put to test some search algorithms to find the optimal path to a specific goal.