PhD Defense: 'Indoor positioning for smartphones without infrastructure and user adaptable'

Data: venres, 15 novembro, 2019 - 11:00 - 13:30

Lugar: CiTIUS Assembly Hall

Poñente(s): Germán Rodríguez (CiTIUS predoctoral researcher)

Idioma: Castelán

Streaming: Por confirmar

Given that the classic solutions for positioning outdoors, such as GPS (Global Positioning System) or GNSS (Global Navigation Satellite System) do not work indoors, there have been emerging multiple alternatives for Indoor Location. Usually these solutions require extensive and complex installations, which involve high costs.

In this thesis we address the problem of indoor positioning with mobile phones with the goal of maximizing the accuracy of estimated positions while minimizing the infrastructure required. We have worked on two main scenarios: Indoor positioning for pedestrians and for vehicles. At the same time our solution must work in real world situations. This implies that it must be robust to different users and hardware, allow normal use of the telephone (use it to talk, carry it in the hand or pocket, etc.) and work while carrying out different activities.

Our proposal makes use of the sensors of the smartphone in order to estimate and update the position of the user. It combines absolute position measurements, taking advantage of the already existing infrastructure of the building (WiFi, BLE), with the information of the inertial sensors of the smartphone (accelerometer, gyroscope, magnetometer) in order to determine the displacement of the user. Combining this information allows us to relate the measurements both temporally and spatially and thus obtain greater precision without the need to increase the infrastructure.

Supervisors: Roberto Iglesias Rodríguez and Adrián Canedo Rodríguez