

Expression of Interest



Contact Person/Scientist in Charge

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Universitat Politècnica de València (UPV)

Department / Institute / Centre

- **Name:** ITACA - Universitat Politècnica de València
- **Address:** Campus de Vera; Camino de Vera, s/n; Valencia (46022)
- **Province:** Valencia

Research Area

- Information Science and Engineering (ENG)
- Environmental Sciences and Geology (ENV)

Brief description of the institution:

Universitat Politècnica de València (UPV) is the single Spanish Technical University that features in the main University world rankings. It is within the top 5 Spanish Universities with the highest revenue from both public research and knowledge transfer activities, and a national leader in patent license income and start up creation. Constituted in 1971, it comprises nearly 30.000 students, over 2500 academics, and 17 university research centres of excellence.

UPV has a relevant experience in the participation in international research programmes, with over 100 FP7 projects and 40 H2020 projects in the period 2014-2015. UPV researchers are also actively involved all H2020 life program stages, from workprogramme drafting discussions, to project coordination. It is also taking part in several major partnering initiatives (JTIs, PPPs, KICs...).

Brief description of the Centre/Research Group (including URL if applicable):

The Institute for the Applications of Advanced Information and Communication Technologies (ITACA) is a research and development entity of the Universitat Politècnica de València. It is located in the UPV Scientific and Innovation Park “Ciudad Politécnica de la Innovación” CPI.

The mission of ITACA is the applied research in the Information and Communication Technologies (ICT) field. ITACA focuses its effort to the development of technologies for public and private companies, both in the national and the international scope. By the development of those technological innovations, ITACA aims to reinforce the competitiveness and economic development of the industrial sector, which are directly reflected to the European Society.

ITACA technologic offer is focused it several fields: digital electronic systems, industrial electronics, telecommunication systems, telematics, ICT systems in healthcare, sensor integration, electronic compatibility, electromagnetism and microwave research.

Project description:

GNSS and WSN Cloud Orchestration for Smart Agri-Food sector

Global Navigation Satellite Systems (GNSS) lie in L band, which is the most sensitive band for soil moisture microwave remote sensing. It is possible to estimate soil moisture with measurements from a standard single ground-based dual-frequency geodetic GNSS receiver. These geodetic-type GNSS instruments could successfully be used to measure the reflected signals too avoiding the need to build a double GNSS antenna system, reducing the costs of the technique.

The studies performed using observations from GPS constellation show very good correlation with land soil moisture sensors at a 10 cm depth. The challenge comes from the use of the upcoming GALILEO full operation constellation, so soil moisture information at 20-25 cm depth is expected.

Moreover, measurement is improved by a Wireless Smart Sensor Network with soil moisture sensors and active RFID to both reduce power consumption regarding to communications and to tag geo-location points and data. Sensors support in GNSS data calibration shaping a high resolution and reliable monitoring system useful to reduce the water consumption in Smart Agri-Food by determining optimum water use and soil moisture areas variability.

Eventually, the physical system in complemented with an Internet connection to Cloud Orchestration software. System measurement points, GNSS antennas and wireless sensors, are deployed as context-aware services in a Service Oriented Architecture (SOA). Service clients, such as daily 3D soil moisture maps producers or decision makers, will be implemented as subscribers of this monitoring system.

Applications

Required documents are (but not exclusively):

CV, letter of motivation, previous experience in research teams, and future expectatives.