UNIVERSITAT POLITÈCNICA DE VALÈNCIA

iMiDRA

Instituto Madrileño de Investigación y Desarrollo Rural, Agrario y Alimentario

First Workshop on Sensing Systems for Agricultural Management (SeSAM)

ICNS 2021

Editorial:

Lorena Parra

Universitat Politècnica de València / IMIDRA

Lorena Parra

- Degree on Environmental Sciences + Master of Coastal and Marine Ecosystems Management + Master on Aquaculture.
- PhD on 2018 about sensing technologies for aquaculture monitoring by the Universitat Politècnica de València.
- Postdoctoral researcher on sensing technologies for agricultural management in Universitat Politècnica de València / IMIDRA.
- Up to 40 published papers and 35 conference papers.
- Participation in 3 international projects and 3 national projects.

Sensing Systems are highly demanded in several sectors for monitoring the performance and optimise the management and specially in agriculture.

In the view of expected restrictions in the application of inputs for the agriculture and the requirements to increase the production while maintaining healthy soils and biodiversity in the ecosystems the technology is the best tool for farmers.

This technology can be implemented in different stages and in different ways: by using sensing devices or by incorporating these devices into the agricultural machinery. Regardless the preferred option, the inclusion of sensing systems are required to gather data from the environment.

The sensing systems include not only the sensing elements but also a series el devices and communication technologies that allow the data gathering, processing, and transmission.

We can identify some requirements for those elements to ensure its operation in real scenarios exposed to a high degree of uncertainty due to the changing circumstances caused by the fauna and flora, the meteorological conditions or even the actions of farmers.

- High robustness
  - For the data management/transmission (fault tolerance, data retrieval, or recognition of false-positives algorithms)
  - For the sensor (low maintenance requirement, simple and modular components, or no-calibration requisites)
  - For the nodes (low energy consumption, tolerance to adverse conditions, or high processing capacity)

We can identify some requirements for those elements to ensure its operation in real scenarios exposed to a high degree of uncertainty due to the changing circumstances caused by the fauna and flora, the meteorological conditions or even the actions of farmers.

- Low cost
  - For the data management/transmission (using technologies capable of integrating into a previously deployed system, and having the capacity of using existing communication channels)
  - For the sensor (low-cost components without continuous replacement needs)
  - For the nodes (energy harvesting systems to avoid using batteries)

We can identify some requirements for those elements to ensure its operation in real scenarios exposed to a high degree of uncertainty due to the changing circumstances caused by the fauna and flora, the meteorological conditions or even the actions of farmers.

- Easy-to-use for farmers
  - For the data management/transmission (integrate data into friendly interfaces in existing devices such as smartphones or smart agricultural machinery)
  - For the sensor (plug and play, no modifications or adaptations requirement or easy deployment)
  - For the nodes (plug and play, limited configuration required, configuration using Apps.)

SeSAM 2021 CONTENT:

- Comparison of performance in weed detection with aerial RGB and thermal images gathered at different height
  - Jose F. Marin, David Mostaza-Colado, Lorena Parra, Salima Yousfi, Pedro V. Mauri, and Jaime Lloret
- Estimating the canopy cover of Camelina sativa (L.) Crantz trought aerial RGB images
  - David Mostaza-Colado, Lidia Díaz-Fuentes, Andrea Collado-Gómez, Pedro V. Mauri, and Aníbal Capuano
- Development of a Low-Cost Optical System for Monitoring Plastics in Irrigation System Grids
  - Daniel A. Basterrechea, Sandra Sendra, Lorena Parra, Jaime Lloret
- Evaluation of Temporal Stability of Dissolved Oxygen Conditions in a Small-Scale Phytodepuration
  - Barbara Stefanutti, Celia Cano, Jose Plaza, Lorena Parra, and Pedro V. Mauri