

## POSTDOCTORAL POSITION OFFER FORM

1. Job Position title: *Artificial Intelligence and ICTs applied to precision irrigation at irrigation district and farm levels.*
2. Keywords: *machine learning, deep learning, precision irrigation, optimization, fuzzy system, ICTs, water distribution networks.*
3. Researcher in charge in DAUCO:
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#### 4. Research Group description (max. 2.000 characters)

The research group “Hydraulics and Irrigation” is part of the Department of Agronomy in the University of Córdoba. Despite being relatively small, the group covers a wide range of research lines, most of them related to the efficient use of irrigation water. Thus, topics such as the design and efficient management of irrigation water distribution networks, application of ICTs to efficient water management, performance indicators and benchmarking in irrigation, water footprint of agro-industrial products and optimization of the water and energy nexus are addressed.

In relation to the optimization of the water-energy nexus, various actions are carried out such as implementing the efficient use of water through precision irrigation techniques, the adequate management of distribution networks to reduce their energy dependence and the implementation of renewable energies (photovoltaic solar energy and micro-hydropower) to reduce the carbon footprint and costs associated with irrigation. Innovative approaches based on modelling techniques, Artificial Intelligence (AI), Big Data and ICTs are used with this aim.

The group is currently developing several projects in these lines and has an important scientific production around 5 and 10 research papers per year, most of them published in first quartile journals. Thanks to this, the University of Córdoba is included in the Shanghai ranking in the field of water resources.

#### 5. Job position description (max. 2.000 characters)

We are looking for a highly motivated postdoctoral researcher with expertise in Big Data analysis, Artificial Intelligence and the new Information and Communication Technologies (ICTs) applied to modelling and optimization of precision irrigation.

The successful candidate should have a PhD degree in agronomical engineering, agricultural water management or similar. She/he must have demonstrated skills and experience in irrigation system and water distribution network modelling, computer programming (mainly with JAVA, Python and Matlab), geographical information systems (e.g. ArcGIS). It is also required some skills in the design, development and implementation of relational and non-relational databases will be also required. Extensive knowledge in fuzzy logic and time series analysis with deep learning (e.g. LSTMs, CNNs) is essential for this job position.

The candidate should also have demonstrated experience in data mining as well as in the development of machine and deep learning models applied to the optimization of water-energy nexus and precision irrigation. Experience of working in the development of APP for mobile devices in Android or IOS environment applied to precision irrigation, and agricultural water management is highly desirable. Scientific communication (including paper and report writing) and experience of working with stakeholders in water resources management in agriculture will be highly valued.