PhD 1

The sediment of alluvial riverbeds plays a significant role in river systems on a broad framework of fields: flood control, lotic system, river restoration activities or hydropower production. However, the sediment composition can show great spatial and temporal heterogeneity, even at river reach scale, making it difficult to take representative samples. Historically, sediment datasets have been acquired in specific locations of the river by costly and time-consuming field surveys. This sediment information acquired tends to be punctual, pertaining to a particular river section and it thus have to be generalized or extrapolated to characterize a whole river reach. This lumped measure of the sediment data limit the analysis of the resulting sediment fluxes and geomorphological patterns in alluvial channels. To help in monitoring rivers, the use of Unmanned Aerial Vehicles (UAVs) is becoming a powerful tool since these acquisition techniques allow to cover the study of large areas in a limited amount of time and it provides high resolution imagery. The proposed project aims to develop field campaigns with drones that allow to further analyze the acquired images by means of deep learning algorithms. Boundaries of the river network, erosion/deposition rates and sediment texture will be thus identified and analyzed.

Responsibilities

- Field measurements (UAVs flights and sampling field campaigns)
- Deep learning and statistical data analysis
- Active member of our scientific team and doctoral student group
- Conference talks
- Write scientific publications

The project is funded by the European Research Council for a duration of four years. The start is planned for first semester of 2023. The salary is fixed according to the established salary level for doctoral students.

We are looking for an enthusiastic and independent person with a passion for science. Candidates for this position should hold (or be in the process of obtaining) a MSc degree in environmental engineering, environmental science (geography, geology), physics, computer science or similar. The person likes to work with the computer and in the field, where creative, practical solutions are needed. Ideally, candidates demonstrate knowledge or high motivation to learn programming (e.g. R or Python software), statistical analysis; and deep learning algorithms. Good knowledge of written and spoken English is required, skills in Spanish are an asset.

The position is based at CSIC in Instituto Pirenaico de Ecología (IPE-CSIC). The research centre is located within the Zaragoza metropolitan area. Zaragoza is an enjoyable city in terms of science, culture and quality of life.

Applications should include a concise statement (max. 2 pages) describing your motivation to carry out a PhD project on this topic, curriculum vitae, copies of your academic records and contact information for two references.

The deadline for applications is 28 February 2023 or until the position is filled.

For further information, please contact: Dr. Carmelo Juez (carmelo.juez@ipe.csic.es)

Interested candidates should apply by emailing the required documents to Dr. Carmelo Juez (carmelo.juez@ipe.csic.es)