

Marie Skłodowska Curie Action –Postdoctoral Fellowship 2022
(MSCA-PF-2022)

Contact Person/Scientist in charge <i>(datos del IP del grupo de investigación o responsable científico)</i>	Name	Eduardo
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Department /Institute /Centre <i>(datos del centro/departamento donde estaría ubicado el investigador a contratar)</i>	Name	Research Center on Software Technologies and Multimedia Systems for Sustainability (CITSEM)
	Address	UPM South Campus, Arboleda Building, 3, Alan Turing, 28031 Madrid
	Province	Madrid
Research Area <i>(en base a las 8 áreas científicas establecidas en MSCA. Se podrán seleccionar entre una y tres áreas científicas por EOI)</i>		Information Science and Engineering (ENG) Life Sciences (LIF)
Brief description of the Centre/Research Group <i>(Max. 1600 caracteres con espacio: información sobre el centro / grupo de investigación / personal científico, destacando los aspectos más relevantes de los mismos. Incluir URL si es posible.)</i>		<p>The CITSEM is formed by researchers and academic staff in the Software Engineering and Multimedia Systems Technology Area. The Electronic and Microelectronic Design Group of CITSEM (GDEM-CITSEM) will be involved in this proposal. The GDEM-CITSEM is a UPM Research Group since 1996 and a foundational member of CITSEM since 2011. The GDEM-CITSEM is composed of academic staff, 8 members, and a number of researchers. The research is focused on fields strongly related to the proposal: Image and Video Technologies, specifically, Hyperspectral Imaging and High-Performance Computing. The main research lines in the project field are real-time depth estimation for different computing platforms, registration of hyperspectral images and MRI, machine-learning based classification of hyperspectral imaging. In the last 5 years, GDEM-CITSEM researchers have been involved in 6 funded research projects and 1 application-oriented projects in the Cyber-Physical Systems field. More than 30 papers have been published during the same period.</p> <p>https://www.citsem.upm.es/en/</p>
Project description <i>(Max. 1800 caracteres con espacio: breve descripción sobre el proyecto /línea de investigación en el que se acogería al investigador/a Marie S.Curie.)</i>		<p>Brain tumours may originate from neural elements within the brain, or they may represent metastasis of distant cancers. Traditional pathological diagnoses of brain tumours are based on excisional biopsy followed by histology or cytology. The main weakness of this standard methodology is twofold: first, it is an aggressive and invasive diagnosis with potential side effects and complications due to the surgical resection of both, malign and healthy tissues; and secondly, diagnostic information is not available in-vivo in real time and demands the tissues being processed in a laboratory.</p> <p>Hyperspectral Imaging (HSI) is a form of imaging spectroscopy that captures spectral and spatial data drawn from the interaction between light and matter. Hyperspectral cameras capture in-vivo spectral information related to the chemical composition of a scene. They have been employed as a diagnosis tool in neurosurgery and other medical fields, mainly to provide a user-friendly real-time guidance. Hyperspectral camera pixel frames (hyperspectral cubes) are processed by machine/deep learning algorithms to automatize diagnostics in real-time. These data can be combined with other</p>



Expression of Interest – UPM Supervisor

well-established data sources such as MRI, PET, CT, Tractography or IOUS to aid neurosurgeon's clinical decisions. Although algorithms have been envisioned to differentiate between pathological and healthy tissues, it is **currently not well understood how cellular and molecular tumour structure determine the captured spectral signatures.**

Applications: documents to be submitted and deadlines

(Indicar qué documentación deberá remitir el /la investigador/a interesado/a al centro para establecer el contacto: CV, letter of motivation, letter of references, etc., así como la fecha límite para el envío de la misma. Recomendado: Hasta finales de abril 2022)

The following documents should be submitted by end of April 2022:

- CV
- Brief letter describing your motivation and previous experience
- Any reference you can provide from professors of the field

Deadline: 9th May 2022