



UNIVERSIDAD  
POLITÉCNICA  
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## POSTDOCTORAL POSITION

### CALL FOR EXPRESSIONS OF INTEREST

#### Information Processing and Telecommunications Center / IP&TC / UNIVERSIDAD POLITÉCNICA DE MADRID

##### 1. Who we are?

The Information Processing and Telecommunications Center (IP&T Center <https://iptc.upm.es>) was created by the Universidad Politécnica de Madrid (UPM) following the initiative of a number of highly competitive and recognized research groups working in the fields of Electronics, Communications, Networks, Computing and Software, with a strong vocation for multidisciplinary and internationalization. The Center, by gathering the skills and experience of researchers and teams in a variety of ICT areas, have as the main objective to improve radically the position of UPM as an institution facing the new challenges of research, innovation and education which are being posed by the emerging ICT technologies and services. The Center is committed with the UPM seal of 'HR Excellence in Research Award' of the European Commission Human Resources Strategy for Researchers (HRS4R), as an institution that aligns its human resources policies to the 40 principles of the European Charter & Code for recruitment of researchers.

##### 2. About the project

The position is offered in the context of the projects:

- PID2021-128469OB-I00: Screening and evaluation of Parkinson`s Disease using motor and non-motor biometrics,
- TED2021-131688B-I00: Screening and evaluation of Parkinson`s Disease using biometrics based on radar technologies,

both funded by The Spanish Ministry of Science and Innovation.

The project aims to **develop new motor biomarkers** -collected from tests of fine motor skills of the hands during certain drawing tasks, and of gross motor skills during walking-, **and of new non-motor biomarkers** -based on speech and oculography-, for the **design of automatic systems for screening, differential detection, evaluation and prediction of the degree of involvement of Parkinson's disease**, using techniques based on digital signal processing and artificial intelligence. To do this, we will carry out a multimodal analysis of the enumerated biometrics, fundamentally **putting emphasis on a novel non-invasive and non-contact approach based on the processing of the oculographic sequences and the use of radar devices for gait analysis**. The proposed approach represents a radical change of the technological paradigm used to evaluate the disease.

**This is a highly multidisciplinary project involving data science, electronic technology and medicine**, for which we propose a consortium made up of a team of interdisciplinary engineers and another of specialists in neurology.

##### 3. Activities to be carried out

This position is framed in the project TED2021-131688B-I00 funded by MCIN/AEI/10.13039/501100011033, and by the European Union NextGenerationEU/PRTR



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The research activities will be developed in the following topics:

- Biometrics of neurological diseases
- Screening and assessment of Parkinson's Disease
- Robust and trustworthy machine learning
- Interpretability and fairness
- Improving effectiveness in low-resourced domains
- Signal processing

#### 4. What do we offer?

- A two-year fully funded postdoctoral position
- Commitment & contract: 2 years fixed term contract (1+1, after an evaluation)
- A competitive salary (including holiday allowance and health insurance) of 40.000 €/year (gross amount)
- An international scientific environment driven by excellence in fundamental research
- Opportunities for travelling to conferences and research visits to international partner research groups.

#### 5. Requirements

Candidates are required to:

- Hold a PhD degree in computer science, computer or electronics engineering, physics, mathematics or equivalent
- An excellent record of publications
- Strong teamwork skills, and ability to work collaboratively in an interdisciplinary environment
- Candidates should have a fluent competency in written and spoken English
- Good communication skills
- Strong experience with machine learning and deep learning
- Experience with deep learning frameworks

#### 6. How to apply

Interested candidates should provide the following documentation:

1. A detailed CV (with complete contact details),
2. A motivation letter related to the offered projects and how the candidate will contribute to it (max 2 pages),
3. Complete contact details (name, title, mail and telephone) for two referees.
4. Endorsement letters are welcomed, but not mandatory.

All documents should be submitted via email to Juan Ignacio Godino Llorente (ignacio.godino@upm.es)

**Submission deadline:** December 1st, 2023 or until the position is filled

#### Further information

Juan Ignacio Godino Llorente (Full Professor)

Phone: +34 9106 72363

[ignacio.godino@upm.es](mailto:ignacio.godino@upm.es)

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