

Position Offered: PREDOCTORAL RESEARCHER

Project: *Bioinspired (multi)informed robotic controllers to improve human balance*

Technological and scientific fields: Artificial Intelligence, Robotics, Medical Devices

Location: Arganda del Rey, Madrid, Center for Automation and Robotics

Research Group/PI: BioRobotics group / Cristina Bayón

PROJECT SUMMARY

Effective control of upright posture during standing and walking is crucial for performing daily activities. Humans control balance by controlling the center of mass. Our central nervous system integrates information from various sensory inputs, including visual, vestibular, and somatosensory signals. Due to deficiencies in the processing of one or more of these sensory inputs, people with neurological disorders often rely excessively on unimpaired sensory pathways to compensate for deficient ones. This may facilitate balance but also results in exaggerated responses, inappropriate modulation of muscle activity, and delayed balance reactions.

In this R&D project, we will use artificial intelligence (AI) techniques and non-invasive artificial feedback methods aimed at increasing the response of altered sensory inputs to answer various questions: What are the main alterations of the sensorimotor processes that lead to compromised balance control in neurological disorders? How can we predict loss of balance? Which artificial biofeedback techniques are most effective? How can we develop cooperative controllers that improve human-robot interaction? How can advances in biofeedback strategies along with assistive robotics be optimally combined and adapted to help improve human response?

PROFESSIONAL PROFILE

Minimum requirements:

- Bsc. in Engineering (Biomedical, Industrial, Electronical...)
- Msc. Related to the use of artificial intelligence in medical robotics
- Fluent in Spanish and English
- Knowledge on artificial intelligence, deep learning, neural networks...
- Previous experience with programming languages

Merits to be considered:

- It will be positively considered stays or periods abroad
- Internships in hospitals or companies related to the biomechanical engineering field
- Other languages

WHAT IS OFFERED

4 years predoctoral contract in the BioRobotics group at the Center for Automation and Robotics, CAR-CSIC. Two predoctoral stays are considered along the project (3 months at the University of Aalborg, and 4 months at the University of Twente).

Contract conditions:

Predocctoral Researcher contract of 4 years' duration. Gross annual salary of 23,871.33 €.

Start of contract: before 31 December 2024

PRINCIPAL INVESTIGATOR CONTACT

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Financiado por
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