Position: Doctoral Candidate #07 (DC 07)
Project: Cognitive architecture for agricultural robots supporting anticipation
Host Institution: University of Extremadura - Spain
PhD programme: PhD in Information Technology

Research project description

The PhD candidate will design a cognitive architecture for agricultural robots, focusing on time-based multi-sensor data fusion to enhance perception and decision-making. This new architecture will integrate distributed planning and anticipation support capabilities, extending to include temporal dimensions for improved robotic performance in agricultural tasks. The research involves analyzing existing cognitive architectures, developing novel fusion techniques, and validating results on real platforms.

Objectives:

1. Analyse and compare existing cognitive robotics architectures in the context of agriculture.
2. Design a cognitive architecture for agricultural robots with planning and anticipation support capabilities.
3. Integrate a time-based multi-sensor fusion system into the cognitive architecture.
4. Validate the developed architecture on real platforms.

Expected Results:

- A new time-based multi-sensor data fusion for perception system on agriculture robots.
- A novel robotic cognitive architecture planning and anticipation support capabilities.
- Disseminate the results in world-class international conferences and journals.

Keywords: *multi-sensor fusion*; *cognitive robotics; agricultural robotics*.

Secondments

The secondments planned for this research project are at:

- Polytechnic Institute of Coimbra- Coimbra Agriculture School (in Portugal) to work on skill transfer applied to perception and fusion of sensor readings from real agri-environment.
- Spotlite company (in Portugal) to work on skill transfer applied to perception and fusion of sensor readings from real agri-environment.

Desirable skills, qualifications and specific requirements

- Your application should respect the **AIGreenBots** general requirements and eligibility criteria as described in https://aigreenbots.eu/recruitment/general-info.
- You should have preferably a valid MEng/MSc degree, or equivalent, in electrical engineering, computer science, mathematics, physics, or related fields.
- C++ and Python programming skills
- Some experience on robotics, machine learning, AI, coding. Motivation, sense of responsibility, autonomy and problem-solving skills are highly desirable.

Benefits

- Very attractive salary - living allowance (gross): 3.104,20 €/month
- Excellent conditions including - social security tax, food allowance, PhD tuition fee, mobility allowance, family allowance (if eligible)
    - Mobility allowance (if applicable): 600€/month
    - Family allowance (if applicable): 495€/month
- Research, training and networking costs covered: Registration and attendance at international conferences, as well as the costs associated with publications in international peer-reviewed journals.

How to apply

You should submit your application through this channel: https://aigreenbots.eu/recruitment/apply-now

Deadline: 02 of March 2025, 23:59.

Additional information

Supervisors of this PhD project: Prof. Luis V. Calderita, Prof. Pedro Nuñez Trujillo

Host institution and living conditions: The University of Extremadura (Universidad de Extremadura) is a dynamic and growing institution in southwestern Spain, renowned for its commitment to academic excellence and regional development. Established in 1973, it serves as a key educational and research hub in the autonomous community of Extremadura. The university offers a wide range of undergraduate, postgraduate, and doctoral programs across diverse fields, fostering innovation and interdisciplinary collaboration. Your PhD work will be carried out in RoboLab, the Robotics and Artificial Vision Laboratory of the University of Extremadura, a research group specializing in robotics, computer vision, and intelligent systems.

Cáceres is a captivating city where history and culture come alive. As a UNESCO World Heritage Site, it offers a unique blend of medieval charm and vibrant modernity. As a student, you will find yourself surrounded by stunning architecture, cobblestone streets, and an inspiring atmosphere steeped in centuries of tradition. Cáceres is a peaceful and welcoming city, perfect for fostering personal. Its rich cultural heritage, coupled with a warm and inclusive community, makes Cáceres an exceptional place to live, learn, and thrive.