Position: **Doctoral Candidate #5 (DC 5)**
Project: **Dynamic multi-sensor models for Agri-bots**
Host Institution: CNRS – Centre National de la Recherche Scientifique, France
PhD programme: Université de Lorraine, IAEM

Research project description

The PhD candidate will investigate reasoning techniques for task-level planning and perception i.e., reliable AI/ML for Agribots task planning. In particular, he/she will investigate how to link the best strategy for a given mission to the sensing, planning and mission execution, when the representation of the state of the world embeds uncertainties in the environment. He/She will start by using classical and hierarchical task planners to compute plans for the tasks. Then, he/she will integrate state-of-the-art techniques, such as Graph Neural Networks, to select the actions the more useful for a reliable mission completion.

Objectives:

1. Evaluate existing classical and hierarchical task planners within the context of agricultural robots.
2. Implement a state of the world representation that embeds uncertainties in the environment.
3. Develop a framework, based on Graph Neural Networks, to evaluate utility of actions towards reliable mission execution.
4. Validate the results in real platforms (secondments).

Expected Results:

- Design and implementation of an efficient framework for reliable task planning for agricultural robots.
- Integration of the approach in a distributed architecture, with heterogeneous robotic platforms and field evaluation.
- Disseminate the results in world-class international conferences and journals.

Keywords: ***robotics, task planning, adaptive path planning, machine learning.***

Secondments

The secondments planned for this research project are at:

- University of Extremadura (Spain)
- Gamma Solutions (Spain)

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.
- Python and C++ 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): 34,000€/year, mobility allowance 427€/month, family allowance 469€/month (if applicable)
- Excellent conditions including - social security tax, food allowance, PhD tuition fee, mobility allowance, family allowance (if eligible)
- Research, training and networking costs covered: Registration and attendance at international conferences.

Funded by the European Union

AIGreenBots has received funding from the European Union's Horizon Europe research and innovation programme under the Marie Skłodowska-Curie Actions (MSCA) Grant agreement ID 101169330.

How to apply

You should submit your application through this channel: CLICK HERE

Deadline: 16 February 2025, 23:59.

Additional information

Supervisors of this PhD project: Prof. Cédric Pradalier (Georgia Tech Europe, CNRS), Dr. Stéphanie Aravecchia (Georgia Tech Europe, CNRS).

Host institution and living conditions:

This PhD will be conducted within the Georgia Tech-CNRS joint laboratory. This laboratory is the result of a strategic alliance between the Centre National de la Recherche Scientifique (CNRS, France), and the Georgia Institute of Technology (Georgia Tech, US). The Georgia Tech-CNRS laboratory is held in Metz, France, on the European campus of Georgia Tech: Georgia Tech Europe. The PhD will be carried out in the DREAM Lab, the robotics group of Georgia Tech-CRNS. The PhD will be registered to the Université de Lorraine, doctoral School IAEM.

Metz, France is the capital of the northeastern region of Lorraine, part of the larger Grand-Est region. Situated near the border of Belgium, Luxembourg, and Germany, this historic city has been called "the gateway to Europe." Just 80 minutes from Paris by train, Metz is at the heart of renowned arts, political movements, scientific innovation, and more. Today, Metz is known as much for its beautiful Gothic cathedral and the Centre Pompidou-Metz, as it is for being a center for innovation, driven in part by Georgia Tech-Europe.

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