

## 1 Research Grant Announcement (M/F)

Call open for applications for a research grant within the framework of project PTDC/EEI-AUT/32485/2017 – MAGIC – Multi-Agent Control and Estimation for Multi-Horizon Goals Conciliation - POCI-01-0145-FEDER-032485, funded by FEDER funds through COMPETE2020 - Programa Operacional Competitividade e Internacionalização (POCI) and by national funds (PIDDAC) through FCT/MCTES, of the SYSTEC Research Unit – Center for Research of Systems and Technology of the Faculty of Engineering of the University of Porto (FEUP), under the following conditions:

**Scientific Area:** Electrical and Computer Engineering, Computer Engineering, Mechanical Engineering, Computer Science, Mathematics, Applied Mathematics or in related fields.

**Admission requirements:** Candidates who cumulatively meet the following two requirements may apply for this grant:

- Be a student enrolled in a PhD in one of the following areas: Electrical and Computer Engineering, Computer Engineering, Mechanical Engineering, Computer Science, Mathematics, Applied Mathematics or in related fields; This requirement must be duly proven in the act of signing the contract.

Or

- Holder of an academic degree enrolled in a non-academic degree course integrated in the educational project of a higher education institution, developed in association or cooperation with one or more R&D units, requirement to be duly proven at the time of signing the contract.

*Note: In the case of masters who are enrolled in non-academic degree courses, the scholarship can only be awarded to those who do not exceed, with this scholarship contract, including possible renewals, an accumulated period of two years in that typology of the scholarship, followed or interpolated.*

and

- Hold a master's degree in Electrical and Computer Engineering, Computer Engineering, Mechanical Engineering, Computer Science, Mathematics, Applied Mathematics or in related fields.

*If the degree has been awarded by a foreign higher education institution, it must comply with the provisions of the Decree-Law no. 66/2018, of august 16th, and any formalities established there must be fulfilled until the time of signing the contract.*

**Activity Outline:**

This project addresses the conception and development of a new architecture - based on optimization - of control and estimation of a multi-agent system restricted to a common environment, allowing to reconcile the desirable long-term evolution of the global system with the generally short-term individual objectives. in conflict with the first. The proposed abstract control architecture will be specified, implemented and validated in two significant demonstration scenarios for the Northern Region of Portugal:

- a) Sustainable management of intensive dairy farms in the northwestern plains of Portugal.
- b) Management of agricultural land in the Peneda-Gerês National Park aiming at Biodiversity Conservation.
- c) In addition to being scientifically challenging, both domains of demonstration are very significant in the economic, social and environmental spheres. The proposed research builds on the consortium's successes in the fields of demonstration and control.

The scholarship holder will be integrated in the Research activity of the MAGIC project team, within the scope of the tasks of the ongoing activities:

Task 4 - Analysis and Design

Task 5 - Multi Agent Estimation

Task 6 - Integration

Task 7 - Extensions to Time Multi-scala and to Impulsive Systems

Task 8 - Case Studies Validation

**Legislation and regulations:** Law N.º. 40/2004, of 18th August, in its current wording (Statutes of Scientific Research Fellow) and Regulation of Research Grants of Fundação para a Ciência e a Tecnologia, in force (<https://www.fct.pt/apoios/bolsas/regulamento.phtml.pt>) and Regulation of Research Grants of University of Porto.

**Workplace:** The work will be developed at the Department of Department of Electrical and Computer Engineering of the Faculty of Engineering of the University of Porto (FEUP), under the scientific supervision of Professor Fernando Manuel Ferreira Lobo Pereira.

**Grant duration:** Initial duration of **6 months**, with the predicted starting date in **September 2021**, on an exclusive basis eventually renewable but never exceeding the project duration.

The eventual renewal of the scholarship will be carried out as determined in article 6 of the Research Grants Regulation of the Foundation for Science and Technology, I.P.

**Stipend:** The grant stipend amounts to 1.104,64 € according to the table of values of the grants awarded directly by FCT, I.P. in the Country (<https://www.fct.pt/apoios/bolsas/valores>). The payment will be made by bank transfer.

**Selection procedure:** Candidates will be graded on a scale of 1 to 5 points. A curricular evaluation (60%) will be carried out, which will focus on the candidate's merit, in which the following factors will be considered:

**Curricular evaluation classification = (30% \* AC1) + (30% \* AC2) + (40% \* AC3)**

- a) AC1 - Academic training:
- Master's Degree in Electrical and Computer Engineering, Informatics Engineering, Mechanical Engineering, Computer Science, Mathematics, Applied Mathematics or in related areas relevant to the project - 5 points;
  - Other Masters -  $[\geq 0 \text{ and } < 5]$  points;
- b) AC2 - Master's final average:
- $[\geq 17 \text{ values}]$  – 5 points;
  - $[\geq 15 \text{ and } < 17 \text{ values}]$  –  $[\geq 4 \text{ and } < 5]$  points
  - $[\geq 13 \text{ and } < 15 \text{ values}]$  –  $[\geq 3 \text{ and } < 4]$  points
  - $[< 13 \text{ values}]$  – 2 points;
- c) AC3 – Research experience:
- in the project area –  $[\geq 4 \text{ and } \leq 5]$  points;
  - in areas related to the project –  $[\geq 2 \text{ and } < 4]$  points;
  - outside the project area –  $[\geq 0 \text{ and } < 2]$  points;

After analyzing the submitted documentation, the Evaluation Panel will interview the 2 best classified in the curriculum evaluation, and candidates who obtain a score lower than 3 points will not be admitted to the interview.

In the interview (40%), topics related to the work plan, previous experience, motivation, and the candidate's CV will be discussed, where the following will be verified:

$$\text{Interview classification} = (60\% * EC1) + (20\% * EC2) + (20\% * EC3)$$

E-C1 - Knowledge and motivation for the exercise of the function:

- Excellent knowledge and motivation –  $[\geq 4 \text{ and } \leq 5]$  points;
- Good knowledge and good motivation –  $[\geq 1 \text{ and } < 4]$  points;
- Lack of knowledge or motivation –  $[\geq 0 \text{ and } < 1]$  points

E-C2 - Attitude (evaluates the candidate's behavior in terms of ability to work in a team, ability to manage conflicts, capacity for persuasion, presentation and confidence)

- Excellent attitude –  $[\geq 4 \text{ and } \leq 5]$  points;
- Adequate attitude –  $[\geq 1 \text{ and } < 4]$  points;
- Inappropriate attitude –  $[\geq 0 \text{ and } < 1]$  points

E-C3 - Capacity of expression and verbal fluency in Portuguese and/or English (coherence and discursive clarity, vocabulary richness, ability to understand and interpret the questions asked).

- Very good ability to express, communicate or interpret –  $[\geq 4 \text{ and } \leq 5]$  points;
- Good ability to express, communicate or interpret –  $[\geq 1 \text{ and } < 4]$  points;
- Difficulty in expressing, communicating or interpreting –  $[\geq 0 \text{ and } < 1]$  points;

The final classification of the interviewed candidates will result from the sum of the classifications obtained in the Curriculum Assessment (AC) and Interview (E), giving each factor the weight of 60% and 40%, respectively:

$$\text{Final classification} = (60\% * AC) + (40\% * E)$$

The right not to hire is also reserved if the candidate with the best final classification does not obtain a classification equal to or greater than 4 points.

#### Selection Jury:

President: Prof. Dr. Fernando Manuel Ferreira Lobo Pereira

Effective member: Prof. Dr. António Pedro Rodrigues de Aguiar

Effective member: Dr. Doutor Oussama Hadj Abdelkader

Supplementary member: Prof. Dr. Maria do Rosário Marques Fernandes Teixeira de Pinho

**Advertisement of final decision:** The results of the evaluation will be released to the candidates by email to the email address indicated in the application process.

**Deadline for applications and form of presentation of the applications:**

The call is open from 09-09-2021 to 22-09-2021 (until 23h59m, GMT time).

Applications must be formalized by email to [flp@fe.up.pt](mailto:flp@fe.up.pt), [sas.systemec@fe.up.pt](mailto:sas.systemec@fe.up.pt) and to [recursoshumanos@fe.up.pt](mailto:recursoshumanos@fe.up.pt), clearly stating the reference (**FEUP-MAGIC-BM**) accompanied by the following documents: Motivation letter, copy of the qualification certificate (referring to the course average - of each cycle or integrated cycle – and, if possible, classifications in the curricular units), Detailed Curriculum Vitae, Declaration on honor that the candidate fulfills the requirement contained in article 6 of the Regulation for Research Grants of the Foundation for Science and Technology, I.P. (model below, for student enrolled in a non-academic degree course integrated in the educational project of a higher education institution, developed in association or cooperation with one or more R&D units) and other documents considered relevant by the candidate.

To guarantee the reading of all documents, the preferred recording format is the Portable Document Format (.pdf).

**DECLARATION ON HONOUR**

I, (identification of the scholarship holder), holder of the Citizen Card / Visa / Residence Permit no. valid until \_\_\_\_\_, declare under honour, to be in the conditions of no. 5 of article 6º of the Research Grants from FCT, IP - Regulation No. 950/2019, of 16 December.

Oporto, \_\_/\_\_/\_\_\_\_

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(Signature of candidate)