INSTITUTO DE SISTEMAS E ROBÓTICA
UNIVERSIDADE DE COIMBRA

CALL FOR 1 RESEARCH GRANT FOR A MASTER WITHIN THE SCOPE OF THE PROJECT RUGGED | Refª RUGGED-BIM-2

Application period: 28-Aug-2026 to 10-Sep-2026

The Institute of Systems and Robotics of the University of Coimbra (ISR-UC) opens a call for applications for one (1) Research Grant for a Master (BIM) **enrolled in a PhD or a non-degree course** within the scope of the RUGGED project, with the reference 2023.16314.ICDT (https://doi.org/10.54499/2023.16314.ICDT), funded by the Portuguese Foundation for Science and Technology (FCT), I.P., in the following conditions:

Type of Grant: Research Grant for a Master (*Bolsa de Investigação para Mestre*), in accordance with article 6 of the Regulation for Research Fellowships of the F*undação para a Ciência e a Tecnologia* (FCT), I.P.

Number of positions: 1

Scientific Area: Electrical and Computer Engineering, Robotics, Mechanical Engineering, Computer Science, or a related area.

Admission requirements: The candidate must hold a Master degree and must be a student enrolled in a PhD or in a non-degree course (*curso não conferente de grau*).

"Courses not conferring an academic degree" must be related to the research fellowship's activity type. "Courses not conferring an academic degree" are the courses referred to in article 4, paragraph 3, letter e) of Decree-Law no. 74/2006, of 24 March, in the current wording, provided that they are developed in association or cooperation between the higher education institution and one or more R&D units, in accordance with the provisions of article 3, paragraph e) of the FCT Regulation for Research Fellowships.

Work plan: The selected candidate will support the RUGGED research team by contributing to the development, integration, and validation of perception and software components for robust robotic operation in extreme agroforestry and firefighting environments. Specifically, the candidate will be responsible for:

- Development of ROS-based perception modules and multimodal sensor processing pipelines for robust operation of UGV platforms in challenging outdoor environments;
- Development and evaluation of multimodal localization methods combining LiDAR, RADAR, RGB/RGB-D, inertial, GNSS-RTK, and other complementary sensing modalities to improve localization robustness under degraded visibility and harsh environmental conditions;

- Design and integration of resilient perception architectures to overcome the limitations of optical sensing in scenarios involving smoke, dust, low illumination, fog, rain, vegetation occlusion, and dynamic terrain conditions;
- Development of multimodal sensor fusion strategies for robust environment perception, obstacle detection, scene interpretation and understanding in extreme operating conditions;
- Investigation and implementation of traversability analysis techniques leveraging geometric, semantic, and terrain-related information to support safe motion planning and semi-autonomous navigation in unstructured environments;
- Integration and validation of perception and navigation modules within the RUGGED robotic platforms, ensuring interoperability with existing middleware, autonomy frameworks, and safety mechanisms;
- Development of safe human-in-the-loop operation support tools, including operator awareness mechanisms, perception-assisted teleoperation functionalities, and safety-oriented decision support components;
- Participation in experimental campaigns and field deployments involving data acquisition, system benchmarking, validation of perception and navigation performance, and robustness assessment under realistic agroforestry and emergency-response conditions;
- Support for scientific dissemination activities, including preparation of technical reports, open-source software contributions, dataset documentation, and publication of research results in international conferences and journals.

Regime: The attribution of the fellowship does not generate or entitle a relation of a legal-labour nature, and the fellowship is undertaken in an exclusive dedication regime. The fellowship holder is awarded the Fellowship Statute of the ISR-UC, in its current wording, according to the Research Fellowship Holder Statute, and according to the Regulation for Research Fellowships of the FCT, both in their current wording.

Regulation: This call process shall comply with the applicable national legislation and regulations governing research grants, namely the Research Fellowship Holder Statute (*Estatuto do Bolseiro de Investigação*), approved by Law no. 40/2004 of 18 August, in its current wording, and the Regulation of Research Fellowships of the FCT (*Regulamento de Bolsas de Investigação*) in force whenever the grant is directly or indirectly funded by FCT, or, when applicable, the ISR-UC Regulation of Research Fellowships approved by FCT.

Location: The activities will take place at the Instituto de Sistemas e Robótica – Universidade de Coimbra.

Duration: 6 months, possibly **renewable**, by agreement between both parties. In accordance with article 6, paragraph 4, letter a) and c) of the FCT Regulation for Research Fellowships, the

grant cannot exceed a period of 12 months for a candidate enrolled in a non-degree course or 48 months for a candidate enrolled in PhD.

Scientific orientation: Professor Paulo Peixoto and Professor David Portugal.

Financial conditions: The amount of the fellowship is **€ 1359.64**, in accordance with the table of values of the scholarships awarded directly or indirectly by FCT in Portugal (https://www.fct.pt/wp-content/uploads/2026/03/Tabela-de-Valores-SMM-2026.pdf), to be paid by bank transfer, plus personal accidents insurance and social security (Seguro Social Voluntário, first level contributions) if the applicant chooses to subscribe.

Selection and attribution criteria: The selection methods to be used will be **a) Curricular Evaluation** (0.3*a1 + 0.4*a2 + 0.3*a3) with a valuation of **100%**. If the Jury deems it necessary, an interview may be carried out with the candidates placed in the first positions according to the ranking resulting from the above criteria. In this case, the final score will include the **a) Curricular Evaluation** (0.3*a1 + 0.4*a2 + 0.3*a3) with a valuation of 70% and the **b) Interview** (0.5*b1 + 0.5*b2) with a valuation of 30%.

a) Curricular Evaluation

Criterion a1. Absolute merit of the candidate, considering his/her performance in the master and bachelor degree, or integrated master degree (**30%**);

Criterion a2. Knowledge of tools and methodologies related to multimodal perception, sensor fusion, localization, and autonomous navigation—demonstrated through coursework or participation in R&D projects involving robotics, computer vision, SLAM, LiDAR processing, traversability analysis, or outdoor autonomous systems. Familiarity with multimodal sensing technologies (e.g., LiDAR, RGB/RGB-D, thermal, GNSS-RTK, IMU) and resilient perception approaches for challenging outdoor environments will be highly valued (**40%**);

Criterion a3. Strong proficiency in C++ and/or Python, ROS-based software development, and perception-oriented robotics frameworks. Familiarity with Linux-based development, sensor integration, real-time data processing, point cloud processing, motion planning, and multimodal localization pipelines is essential. Knowledge of machine learning or deep learning methods for perception, semantic understanding, or obstacle detection in robotics applications will also be considered an asset (**30%**).

b) Interview (should it occur)

Criterion b1. Motivation to work on the project (**50%**);

Criterion b2. Competence in the oral response to questions on the selection criteria subjects. Appropriate spoken English skills will be valued (**50%**).

Jury responsible for selection:
- President: Professor Doctor Paulo José Monteiro Peixoto;
- 1st Member: Professor Doctor David Bina Siassipour Portugal;
- 2nd Member: Professor Doctor João Luís Ruivo Carvalho Paulo.

Formalization of application: Applications must be formalized by sending the following elements:
(1) Letter of motivation **— mandatory**;
(2) Curriculum Vitae (CV) **— mandatory**;
(3) Copy of the Certificate of Qualifications (Master degree) with the final average **— mandatory**;
(4) Proof of enrollment in a PhD or non-degree course of a Portuguese higher education institution, or a Declaration on the Honor by the candidate that he/she will enroll in the course until the date of contract signature **— mandatory**;
(5) A declaration under honour by the candidate listing any fellowships received, their type and duration **— mandatory if the candidate has received any fellowships in Portugal**.

Applicants with academic degrees obtained abroad will be required to present a Certificate of Recognition in accordance with applicable law. This document is mandatory only in the contractualization phase.

Application submission: The applications shall be sent by email to gustavo.bongiovi@isr.uc.pt with CC: davidbsp@isr.uc.pt and peixoto@isr.uc.pt specifying in the subject: Refª RUGGED-BIM-2.

Submission of applications: The application process is open from **28-August-2026 until 10-September-2026.**

Form of publicity / notification of the results: The results of the evaluation will be publicized at the ISR-UC website through a list ordered by the final grade obtained, with the candidates being notified by email. After the dissemination of the results through email, the candidates must consider themselves, from the outset, notified to, if they wish, express themselves in a prior hearing within a maximum period of 10 working days after that date. At the end of this period, the selected candidate must consider himself summoned to start the grant.

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