

ANNOUNCEMENT FOR THE AWARD OF A RESEARCH INITIATION FELLOWSHIP

Research Initiation Fellowship: 2 vacancies

A call for applications is now open for the attribution of two grants of Research Initiation Fellowships within the scope of the R&D project “IMEDiL Inclusive Mathematics Education based on Digital Learning”/Departamento de Matemática da Universidade do Minho, Reference 2021-1-FR01-KA220-HED-000023486, financed by European funds through the Erasmus+ Programme, under the following conditions:

Scientific Area: Mathematics, Computer Science, Engineering.

Recipient category: Students enrolled in one of the following courses at the University of Minho: Bachelor in Mathematics, Bachelor in Computer Science, Bachelor in Applied Statistics, Bachelor or Integrated Master in Informatics Engineering, Bachelor or Integrated Master in Industrial Electronics and Computers Engineering, Bachelor or Integrated Master in Industrial Management and Engineering, Bachelor or Integrated Master in Telecommunications and Informatics Engineering, and other related courses.

Requirement for granting the fellowship:

- Candidates may apply without prior registration in the course for which the scholarship is open. The requirement to enroll in a degree course or non-granting course will be verified on the date of contracting the fellowship.
- For the contractualization purposes, it only is accepted selected candidates who present valid proof of enrollment in the degree course or non-degree course, according to the type of scholarship in the call for application, issued by the academic services of the Higher Education Institution, respectively with the indication of the current academic year or its duration (beginning and end)

Candidates profile:

- a. National, foreign, and stateless persons who are enrolled in one of the following courses at the University of Minho: Bachelor in Mathematics, Bachelor in Computer Science, Bachelor in Applied Statistics, Bachelor or Integrated Master in Informatics Engineering, Bachelor or Integrated Master in Industrial Electronics and Computers Engineering, Bachelor or Integrated Master in Industrial Management and Engineering, Bachelor or Integrated Master in Telecommunications and Informatics Engineering, and other related courses.
- b. Not benefited from a conferring degree research grant for a cumulative period of 2 years followed or interpolated;
- c. Contracting requirements, such as enrolment in a Bachelor or Integrated Master course at University of Minho; proof of academic qualifications completed at the deadline for applications, including those resulting from academic degree recognition processes;

- d. Preferential factors: knowledge of computational tools and programming languages such as R, Python, SageMath, GeoGebra, and knowledge of Calculus, Analysis in \mathbb{R}^n , Probability and Statistics.

Applicants Eligibility: Applicants must comply with the eligibility conditions laid down in article 9 of the Research Grants Regulation of the Portuguese Foundation for Science and Technology (2019).

Workplan:

Objectives to be achieved: Development of computational instruments with a user-friendly interface in order to improve the teaching/learning process of Mathematics, at university level, in a face-to-face teaching environment, distance learning, or individual study.

Tasks:

- First, the candidate must consolidate R, Python, SageMath, or GeoGebra knowledge, depending on their previous training. To fulfil this task, the candidate must use the following references:

<https://www.sagemath.org/>

<https://www.geogebra.org/?lang=pt-PT>

Yihui Xie (2013), Animation: An R Package for Creating Animations and Demonstrating Statistical Methods, *Journal of Statistical Software*, 53(1):1-27

- Second, from certain input data that will be provided, the candidates must develop dynamic applications that illustrate results and mathematical concepts of Curricular Units in the area of Mathematics, namely Analysis in \mathbb{R}^n , Linear Algebra, Probabilities, and Statistics. It is intended to emphasize the visual aspect, allowing the manipulation of the object, either by changing the input data, or by changing the scale, or the angle of view of the object.

The scientific advisors will provide all the mathematical support for the applications to be developed, while the candidate will deal with its computational development and its computer implementation.

As an example, one of the tasks consists of building an interactive computational instrument in which a user (student or teacher) introduces a real function of two real variables and with which it is possible for the user to explore certain functionalities, for example:

- to visualize the function's three-dimensional graph from different perspectives and scales;
- to visualize the tangent plane to the graph at a given point;
- to obtain an animation illustrating the changes that occur in the tangent plane when changing the point of tangency or disturbing the expression of the function;
- to illustrate the relationship between the tangent plane and the partial or directional derivatives of the function.

- Finally, the applications developed should be made available to the UMinho community of students and teachers and on the web page of the I&D project "IMEDiL Inclusive Mathematics Education based on Digital Learning".

The activities to be carried out within the scope of this project reinforce the knowledge in the area of mathematics, computation, and computing, present in the study plan of the degrees of the potential candidates.

Applicable legislation and regulations: Research Fellowship Holder Statutes, approved by Law no. 40/2004 of August 18, in its current version published by Decree-Law no. 123/2019 of August 28; Regulation of Scientific Research Fellowships of the University of Minho (RBIC), published in “Diário da República”, 2nd series, no. 119, through dispatch no. 6524/2020 of 22-06-2020, ratified by ratification declaration no. 447/2021 of 22-06-2021 and Regulation of Research Studentships and Fellowships (RBI) of the Foundation for Science and Technology, I.P. - in force.

Host/Contracting institution and scientific supervision: The work plan will be carried out in the Department of Mathematics of the University of Minho, located in Campus de Gualtar, Braga, under the scientific supervision of Professor José Joaquim Martins Oliveira and Professor Maria da Conceição Soares Serra.

Fellowship duration: The grant will take place for a period of two months and twenty-one days, with a provisional starting date of may 2023. The fellowship grant may eventually be renewed for up to 30 days.

Amount of the research grant: The value stipend (Monthly Maintenance Allowance) is 541,12 euros, in accordance with the stipends values published by the Foundation for Science and Technology (FCT I.P.) in the country (Annex I – Monthly Stipends Values for the maintenance allowances of the FCT Regulation for Research Studentships and Fellowships and Annex II of UMinho’s Regulation of Scientific Research Fellowships (RBIC), published in “Diário da República”, 2nd series, no. 119, through dispatch no. 6524/2020 of 22-06-2020, ratified by ratification declaration no. 447/2021 of 22-06-2021, according to the applicable rules.

Payment is made until the 23rd of each month, through bank transfer to the fellowship holder's NIB indicated in the contracting process.

Exclusivity regime: The grantee will perform the activities under exclusivity, as foreseen in article 5º of the Research Fellow Statutes and applicable regulations.

The selection panel is formed by:

- Maria da Conceição Soares Serra, Assistant Professor at the Department of Mathematics of the University of Minho (President of the Jury),
- José Joaquim Martins Oliveira, Assistant Professor at the Department of Mathematics of the University of Minho (Effective Member),
- Marta Susana Ribeiro Ferreira, Assistant Professor at the Department of Mathematics of the University of Minho (Effective Member),
- Ana Jacinta Pereira da Costa Soares, Associate Professor at the Department of Mathematics of the University of Minho (Substitute Member),
- José Pedro Miranda Mourão Patrício, Associate Professor at the Department of Mathematics of the University of Minho (Substitute Member).

The first effective member will substitute the President of the selection panel in case of impediment, nominating the first substitute member in the place of the first effective member.

Criteria and procedures for applications assessment and selection: The applications assessment will focus on the candidate's Merit, according to the following evaluation criteria, valued on a scale of 1 to 5 values:

Applicant Merit - AM:

- A1.** Academic path (considering the classifications of academic degrees), with a weighting of 40%;
- A2.** Personal curriculum (which reflects the relevance of the professional and scientific background in the scientific area of the fellowship and on the work plan), with a weighting of 30%
- A3.** Motivation letter, and one or two recommendation letters by Professors or Researchers in the area of the application, with a weighting of 30%.

The final classification of the applicant's merit with the achieved through the following formula:

$$AM = (A1*0,4) + (A2*0,3) + (A3*0,3)$$

Candidates with an AM score of less than 3,3 will not be eligible for a research grant.

If the jury considers it is convenient, candidates classified in the first five positions, and who obtain a minimum classification of 3,3 in the AM, will be admitted to the Interview stage, with the Jury proceeding to assess the following sub-criteria:

Interview - INT:

- B.1.** Interpersonal skills (30%);
- B.2.** Knowledge demonstrated in the scientific area of the fellowship (40%);
- B.3.** Motivation (20%);
- B.4.** Language skills (10%).

The Jury will evaluate the Interview, according to the following levels:

- High – 5 values;
- Good – 4 values;
- Sufficient - 3 values;
- Reduced – 2 values;
- Insufficient – 1 value.

The Interview classification (**INT**) will be obtained by applying the following formula:

$$INT = (B1 \times 0,3) + (B2 \times 0,4) + (B3 \times 0,2) + (B4 \times 0,1)$$

If an interview takes place, the final classification (CF) of the Applicant Merit (AM) and Interview (INT) will be obtained by applying the following formula:

$$CF = (AM \times 0,7) + (INT \times 0,3)$$

If there is no interview, the final classification (CF) will coincide with the Applicant Merit (AM):

$$CF = AM$$

The academic degrees and diplomas documents, or their respective recognition when awarded by foreign higher education institutions are not mandatory in the application phase, being replaced by a declaration of honor of the candidate with the contents of academic results. The documents of academic qualification or respective recognition will be required in the contracting phase and must attest to facts that occurred on a date prior to the application. In situations of divergence between the information contained in the declaration and the documentation submitted for contracting the grant,

only the information contained in the latter will be considered. If the documents proving the ownership of the academic degree and diploma, or the respective recognition under the terms of Decree-Law No. 66/2018, of August 16, do not correspond to the classifications awarded in the evaluation of the academic path, which can change the candidate's ranking, the fellowship won't be contracted.

Notes: *Applicants with degrees obtained abroad must present proof of recognition of qualifications in Portugal and conversion of the final classification obtained in them to the Portuguese classification scale or declaration under the terms indicated in the previous point. Candidates who do not comply with one of these provisions, the selection panel will assign "0" in the grade of the graduation and/or master course. Candidates will be evaluated on the remaining parameters.*

Disclosure of results: The provisional results of applications, based on the selection panel minutes, will be sent to the applicants by email until 90 working days from the applications deadline.

If case of unfavourable results, the candidates have a period of 10 working days to comment, if desired, in a prior hearing to interested parties, pursuant to articles 121 and 122 of the Code of Administrative Procedure (DL no. 4 / 2015 of January 7th).

Complaint and appeal procedures: The final results of the evaluation will be published through an ordered list (*alphabetically, by final grade obtained*), posted in a visible and public place of the host unit, as well as by email to all applicants, enclosing for that purpose, the minutes of the jury deliberations.

The selected candidate must inform its willingness to accept the grant, in writing. In case of rejection, the fellowship will be awarded to the next candidate in the ordered list of applicants.

The final decision can be contested within 15 working days, by sending to the President of the jury the corresponding claim. Interested parties may also submit an optional hierarchical appeal, addressed to the Pro-Rector for Research and Projects, Professor Sandra Cristina Almeida Paiva.

Constitution of a selection reserve list: The applicants ranked in the next positions on the ordered list will be included in a selection reserve list, which can be used until July 2023.

Application deadline and submission: The call for applications is open during 15 working days from the date of publication of the notice on the Euraxess Portugal.

Applications must be formalized by sending an application letter with the following documents: curriculum vitae; qualifications certificate or declaration of the applicant; motivation letter; statement proving that meets the conditions for the grant typology, according to the application requirements; other documents important to the evaluation process.

Applications must be sent by email to bolsas@ecum.uminho.pt, indicating the reference 22/ECUM/DMAT/2023-IMEDil in the subject of the email message. Applications submitted by other means will not be accepted.

The recommendation letters from professors or researchers of recognized merit in the scientific area of this call must be sent directly by them by email to the address bolsas@ecum.uminho.pt, indicating the reference 22/ECUM/DMAT/2023-IMEDil in the subject of the email message.

Fellowship contractualization: The fellowship will be attributed by signing a fellowship contract between the University of Minho and the fellow, accordingly to the contract minute (annex IV of the Regulation of Research Fellowships of the University of Minho (RBIC), published in *Diário da República, 2nd Series, no. 119*, through dispatch no. 6524/2020 of 22-06-2020, ratified by ratification declaration no. 447/2021 of 22-06-2021, as indicated in 2.4 of the FCT document: “Rules for Granting and Management of Grants within the scope of R&D projects, including infrastructure projects, the multi-annual financing program for R&D units and other FCT financing instruments (Version 2021)”.

The contract may only be concluded after all the documentation required is collected, which must take place within a maximum period of 6 months (including evidence of the academic degrees or diplomas and enrolment in degree courses or non-conferring courses, depending on the type of scholarship).

Once all the documentation has been received, the contracting entity has a period of 60 working days to conclude the scholarship contract. Once received, the fellow must return the contract duly signed within 15 working days.

The activities under the fellowship contract can only begin after proper authorization by the contracting entity.

Term and cancellation of fellowship contracts: Without prejudice to the other causes provided the fellowship regulations (FCT and UMinho) and in the Statute of the Research Fellow, the fellowship ends with the completion of the work plan, as well as with the expiration date for which it was granted or renewed.

At the end of the fellowship, the grantee is obliged to present a Final Report of the work carried out, in accordance with the objectives and evaluation criteria defined by the scientific advisor, within 30 days after the end of the scholarship.

The **final report** must be prepared in accordance with Annex I of the Scientific Research Fellowships Regulation of the University of Minho (RBIC), published in *Diário da República, 2nd Série, no. 119*, through dispatch n.º 6524/2020 of 22-06-2020, ratified by ratification declaration no. 447/2021 of 22-06-2021.

Note: The information above required should be submitted in the Euraxess Portal, in the fields reserved for those purposes.