

ANNOUNCEMENT FOR THE AWARD OF A RESEARCH INITIATION FELLOWSHIPS

Research Initiation Fellowship: 2 vacancies

A call for applications is now open for the attribution of two 3 months initiation to research grants within the scope of the R&D project “IMEDiL Inclusive Mathematics Education based on Digital Learning”/ Mathematics Department of the University of Minho, 2021-1-FR01-KA220-HED-000023486, financed by European funds through the Erasmus+ Programme, under the following conditions:

Scientific Area: Mathematics and Computer Science

Recipient category: Students enrolled in the 1st cycle course in Computer Science

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 contractualization purposes, it will only be accepted selected candidates who present valid proof of enrollment in a 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 the 1st cycle Bachelor in Computer Science at University of Minho
- 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 the Bachelor in Computer Science at Universidade do Minho; proof of academic qualifications completed at the deadline for applications, including those resulting from academic degree recognition processes;
- d. Preferential factors: knowledge of Linear Algebra and Analytic Geometry, including Matrix Algebra, Gauss Elimination Algorithm, Gauss-Jordan Method, Determinants, Vector Spaces, Linear Transformations, and of Logic, including Propositional Logic and First Order Logic; knowledge of databases; knowledge of LaTeX and programming with Python.

Workplan: Students are expected to create question banks on the Blackboard e-learning platform and on open digital platforms of Audience Response Systems (ARS), to be applied in Mathematics curricular units, such as Linear Algebra, Topics of Discrete Mathematics, and Mathematical Analysis, with the purpose of assessing for learning.

At first, fellows will have to: explore the existing tools on Blackboard for creating question banks; compare the different ARS free-to-use digital platforms to choose one that best suits the creation of questions that involve mathematical writing and that can be used in a classroom

environment with large classes (possibly one that allows the use of LaTeX and accepts a large number of participants).

In a second phase, it is intended that the grantees create question banks on the Blackboard e-learning platform, in order to build questionnaires, with automatic correction, that can be proposed to students as an asynchronous activity within a given curricular unit. These questionnaires will allow feedback to be given to the student on how their learning process is going. As an example, one of the tasks may consist in building a bank of questions on the Blackboard platform about logically equivalent Propositional Calculus formulas. The idea will be to structure a series of questions, with increasing difficulty, that allow the student to know, after receiving feedback from his/her answer attempt, whether or not he/she have mastered the basic concepts of logical value, the meanings of propositional connectives and the relationship of logical equivalence.

As far as ARS is concerned, the grant holders are expected to create questions that allow, in real time, to evaluate the teaching/learning process of certain contents in a class (face-to-face or online). The choice of questions should be made so that the teacher who uses them in the classroom can understand if the contents are being well understood or if he/she should adapt the approach used. For example, in an introductory lesson on matrix algebra, after defining addition of matrices, multiplication by a scalar and multiplication of matrices, in a first question, several matrices A, B, C, D, \dots , of different types, could be given and it would be asked which operations $A+B, 3C, AB, 2A+DC, \dots$ are defined. Students answer the question anonymously, using their mobile devices, and graphics are immediately generated using the given answers, enabling the teacher to assess whether the concepts have been well assimilated or whether extra explanation is required. It is also an opportunity for students to evaluate their learning process through real-time feedback. Next, a question may be asked which requires an operation to be performed: for example, considering two matrices A and B , of the same type, already used in the previous question, indicate which matrix corresponds to $A+2B$. Being able to evaluate if the operations have been well assimilated by the students, the teacher can then proceed to study some properties of the operations and new questions can be asked using the ARS.

The scientific supervisors will provide all the mathematical and pedagogical support for the creation of the question banks, while the grant holders will be responsible for implementing them on Blackboard and on the chosen ARS platforms.

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 workplan 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 the following members of DMAT: Maria Cláudia Freitas de Sousa Mendes Araújo (Assistant Professor) and Maria Suzana Freitas de Sousa Mendes Gonçalves (Assistant Professor).

Fellowship duration: The grants will take place for a period of 3 months, with a provisional starting date on April of 2023.

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.

Selection panel:

President: Maria Suzana Freitas Sousa Mendes Gonçalves, Assistant Professor of the Department of Mathematics of the School of Sciences, University of Minho;

Effective Member: Maria Cláudia Freitas de Sousa Mendes Araújo, Assistant Professor of the Department of Mathematics of the School of Sciences, University of Minho;

Effective member: José Joaquim Martins Oliveira, Assistant Professor of the Department of Mathematics of the School of Sciences, University of Minho;

Substitute member: Ana Jacinta Pereira Costa Soares, Associate Professor of the Department of Mathematics of the School of Sciences, University of Minho;

Substitute member: José Pedro Miranda Mourão Patrício, Associate Professor of the Department of Mathematics of the School of Sciences, University of Minho.

The first effective member will substitute the President of the selection panel in case of impediment, being nominated 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 criteria and sub-criteria and corresponding weightings, valued on a scale of 1 to 5 values:

A: Applicant Merit - AM:

- A1 Academic path (considering the classifications of academic degrees), with a weighting of 40%;

- A2 Personal curriculum (considering professional and scientific background and the relevance of the academic career in the competition's scientific area and in the work plan to be developed), with a weighting of 30%
- A3 Motivation letter and two recommendation letters from professors or researchers in the scientific area of the competition, with a weighting of 30%.

The classification of the applicant's merit **AM** will be achieved through the following formula:

$$\mathbf{AM=(A1*0,4)+(A2*0,3)+(A3*0,3)}$$

Candidates with a classification below 3,3 in AM will not be eligible for a research scholarship.

If the Jury considers it convenient, the candidates classified in the first five positions, and who obtain a minimum classification of 3,3 in the MC, will be admitted to the Interview phase, and the Jury will evaluate the following sub-criteria:

B. Interview - INT:

- B1 Interpersonal skills (30%);
- B2 Knowledge demonstrated in the contest area (40%);
- B3 Motivation (20%);
- B4 Language Skills (10%).

The interview classification **INT** will be obtained by applying the following formula:

$$\mathbf{INT=(B1\times0,3) + (B2\times0,4) + (B3\times0,2) + (B4\times0,1)}.$$

If an interview is held, the final classification **FC** will be obtained by applying the following formula

$$\mathbf{FC=(AM\times0,7) + (INT\times0,3)}.$$

If there is no interview, the final classification **FC** will coincide with the one of the Applicant Merit (AM):

$$\mathbf{FC = AM.}$$

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 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*), as well as sent by email to all applicants, enclosing for that purpose the minutes of the jury deliberations.

A selected candidate must inform his/her 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.

Application deadline and submission: The call is open for 10 working days from the date of publication of the notice on the Euraxess portal.

The applications should be formalised by sending an application letter with the following documents: curriculum vitae; statement proving enrolment in the degree course in Computer Science at the University of Minho; certificate proving the marks obtained in the Curricular Units of the degree course in which the student is enrolled; letter of motivation; letters of recommendation; other documents that the candidates may consider relevant for the evaluation process.

Applications must be sent by email to bolsas@ecum.uminho.pt indicating the reference 21/ECUM/DMAT/2023-IMEDil in Subject. Applications submitted by other means will not be accepted.

Recommendation letters from professors or researchers in the scientific area of the call should be sent directly by them by email to the address bolsas@ecum.uminho.pt, indicating the reference 21/ECUM/DMAT/2023-IMEDil.

Fellowship contractualization: The fellowship will be attributed by signing a fellowship contract between the University of Minho and the fellow, accordingly with 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.

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 with 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 Series, no. 119*, through dispatch no. 6524/2020 of 22-06-2020, ratified by ratification declaration no. 447/2021 of 22-06-2021.