

1 Master Student Research Fellowship (BI)

One Research Fellowship (BI) for a Master Student is open at CEMAPRE (Centro de Matemática Aplicada à Previsão e Decisão Económica), for the project “SDEFish: Sustainable Management of Fisheries with Stochastic Differential Equations (Gestão Sustentável de Pescarias através de Equações Diferenciais Estocásticas)”, with reference EXPL/EGE-IND/0351/2021, funded by the Fundação para a Ciência e a Tecnologia, I.P./MCTES through national funds (PIDDAC), under the following conditions:

1. **Scientific Area:** Mathematics, Statistics, Management, Economics, or related fields.
2. **Requirements for candidate admission:** Master's student in the areas indicated in point 1 of this notice, with knowledge of Numerical Analysis, Optimal Control, and Stochastic Calculus. Bachelor's degree holder in one of the areas indicated in point 1 of this notice. Proven experience in programming in R, Python, or Matlab languages. English Language Proficiency.
3. **Additional optional skills and qualifications:** Availability to work at CEMAPRE facilities.
4. **Contracting requirements:** Evidence of the elements mentioned in point 2 of this notice.
5. **Work plan:** Without prejudice to other functions inherent to the proper functioning of the research project, the work plan includes:
 - a) Using finite difference discretization algorithms based on the Crank-Nicolson method.
 - b) Carrying out Numerical Analysis of the numerical method used to ensure reliability of the results by demonstrating consistency, stability, and convergence.
 - c) Analysis of errors and convergence order of algorithms.
 - d) Creation of numerical code to implement the adopted scheme(s), with the possibility of creating a package (for example, an R/Python package).
 - e) Critical examination of simulations of fish population sizes, profits, and fishing effort.
 - f) Contribution to dissemination of results and article writing.
6. **Legislation framework:** The granting of the research scholarship will be carried out upon the signing of a contract between CEMAPRE and the scholarship holder, as established in the rules for the attribution and management of research scholarships under the terms of the Research Scholarship Statute (Law No. 40/2004 of August 18th and Decree-Law No. 123/2019 of August 28th), available at:
https://www.fct.pt/apoios/bolsas/docs/Normas_de_Atribuicao_de_Bolsas_2021.pdf
in accordance with the legislation and regulation of research grants (RBI) of the Foundation for Science and Technology, IP in force, regulation No. 950/2019 of December 16, 2019, available at: <https://www.fct.pt/apoios/bolsas/regulamento.phtml.pt>.

CEMAPRE

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7. **Place of work:** The work will be carried out at the CEMAPRE facilities, located at Rua do Quelhas, 6, 1200–781 Lisbon, under the scientific guidance of the project principal investigator, Professor Nuno M. Brites.

8. **Fellowship duration:** The fellowship will have an initial duration of 6 months, starting in March 2022, eventually renewable until reaching a maximum duration of 12 months.

9. **Monthly allowance:** The fellowship amounts to €835.98, according to tabled values for the fellowships (<https://www.fct.pt/apoios/bolsas/valores.phtml.en>) awarded directly by FCT, IP. The fellowship holder will have personal accident insurance and may obtain the right to social security through adherence to the voluntary social insurance scheme, if not covered by any other social protection scheme, pursuant to the Código dos Regimes Contributivos do Sistema Previdencial de Segurança Social. The fellowship will be paid monthly by bank transfer.

10. **Evaluation and selection process:** Candidates will be evaluated through the documentation sent and referred to in Point 14 of this notice. Each candidate's score will be calculated by:

- Degree's final average: 35%.
- Average for curricular units in Numerical Analysis, Optimal Control, and Stochastic Calculus: 10%.
- R, Python, or Matlab programming experience: 15%
- English language ability: 15%
- Motivation letter evaluation: 25%

The candidate with the highest score will be selected.

11. Selection Committee:

President: Professor Nuno M. Brites (ISEG & CEMAPRE)
1st Vogal – Professor Marília Pires (UÉvora & CEMAPRE)
2nd Vogal – Professor Manuel Guerra (ISEG & CEMAPRE)
1st Substitute – Professor João Janela (ISEG & CEMAPRE)
2nd Substitute – Professor João Guerra (ISEG & CEMAPRE)

12. **Publication/notification of results:** all candidates will be notified and receive the minutes of the Selection Committee meeting, at the email address from which applications were sent. After the provisional list of results is sent, candidates have a period of 10 working days to express dissent at prior hearing of interested parties, under the terms provided for in the Code of Administrative Procedure.

13. **Deadlines:** This call for applications is open from January 20, 2022, to February 4, 2022.

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14. **Application:** Applications should be sent via e-mail to nbrites@iseg.ulisboa.pt, by attaching the following documents (PDF format):

- a) Curriculum Vitae in English (no more than two A4 pages).
- b) A certificate proving completion of a previous degree. Certificate of curricular units carried out by the master.
- c) A motivation letter in English (no more than one A4 page)

CEMAPRE, 5th of January, 2022

Portuguese version: <https://cemapre.iseg.ulisboa.pt/~nbrites/SDE1.pdf>

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