



CALL FOR AWARDING RESEARCH FELLOWSHIPS WITHIN PROJECT GRANTS AND R&D INSTITUTIONS

One (1) research fellowship for a Master (BI for Master)

One (1) research fellowship for a Master (BI for Master) is open at the **Fundação da Faculdade de Ciências da Universidade de Lisboa, F.P. (FFCUL)**, for the R&D institution 'Instituto de Biofísica e Engenharia Biomédica', BIO/00645 with financial support provided by the FCT/MCTES through national funds, under the following conditions:

1. **Scientific Area:** Biomedical Engineering with emphasis on Signal Processing, Medical Imaging, Classification using Machine Learning
2. **Requirements for admission:** The candidates must have a Master's degree in Biomedical Engineering or in Biophysics and Biomedical Engineering. The candidate must have a proven scientific track record, with at least one peer-reviewed journal publication. The candidate must have completed previous work in machine learning (preferably: support vector machines, deep learning and/or neural networks). It is essential that the candidate has experience in Matlab and Python programming languages, as well as in Graphical User Interface (GUI) applications.
3. **Factors preferred:** Candidates with previous microwave imaging experience is beneficial.
4. **Work plan:** The fellowship will comprise the completion of two main tasks related to the use of machine learning algorithms to improve microwave imaging for breast cancer diagnosis.
The first task comprises the investigation of breast tumour response with classification algorithms using a microwave radar prototype. A number of features will be extracted from the scattering of breast tumours and will then be used in classification algorithms such as support vector machines or deep learning. The results from the classifier will allow creating a statistical images of the breast in which normal breast tissue is classified as a "miss" and tumour tissue is classified as a "hit". Such information is crucial to aid breast microwave imaging by reducing the number of false positives and help identify potential false negatives.
The second task during this fellowship comprises the development of a classification-based skin artefact removal algorithm for a novel microwave imaging application. There is high interest in extending microwave imaging to the diagnosis of axillary lymph nodes since current neoadjuvant non-invasive detection and diagnosis of ALNs is often non-conclusive, causing pre-emptive removal of too many ALNs, and subsequently leading to high levels of morbidity. Microwave imaging of the underarm and lymph node detection is challenging, mainly because of the lymph nodes shallow location under the skin, at a depth of only 2 mm. A new skin-artifact removal will be built upon the state-of the art algorithms developed for breast cancer microwave imaging.
5. **Legislation framework:** A fellowship contract will be celebrated according to the regulations defined by FCT "Regulations for Advanced Training and Qualification of Human Resources", in accordance with Law 40/2004, of 18 August, as amended and republished by Decree-Law No. 202/2012 of 27 August, and as amended by Decree-Law No. 233/2012 of 29 October and by Law No. 12/2013, of January 29, and Decree-Law No. 89/2013 of 9 July; And also by the FCT, I.P. Fellowships Regulation, in force (<http://www.fct.pt/apoios/bolsas/docs/RegulamentoBolsasFCT2015.pdf>) and FFCUL's Fellowship Regulation, as approved on 22nd December 2014.
6. **Place of work:** The work will be developed at Instituto de Biofísica e Engenharia Biomédica, Faculdade de Ciências da Universidade de Lisboa under the scientific guidance of Professor Raquel Conceição.
7. **Fellowship duration:** This position is initially opened for six (6) months and will begin on January 2017. The fellowship contract may be renewed to more 6 months, in accordance with the provisions of Regulation of Research Fellowships from the Foundation for Science and Technology, I.P.



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8. **Monthly allowance:** The fellowship amounts to € 980, according to table values of the fellowships awarded directly by the FCT, IP. (<http://www.fct.pt/apoios/bolsas/valores>).
The fellowship holder will have a personal accident insurance and, if not covered by any social protection scheme can ensure the right to social security through adherence to the voluntary social insurance scheme, pursuant to Código dos Regimes Contributivos do Sistema Previdencial de Segurança Social.
The fellowship will be paid monthly by bank transfer.
9. **Selection method:** Candidates will be assessed by the quality of their CV (33.3%), adequacy of the candidate (33.3%), motivation letter and reference letter(s) (33.3%).
If there is more than one suitable candidate with similar evaluation, an interview (in person or via skype) will take place – potentially on the 14th or 15th of December. In that case, candidates will be notified by email and a date for the interview will be defined. Candidates who are interviewed will have a second evaluation which will be assessed by the quality of their CV (20%), adequacy of the candidate (20%), motivation letter and reference letter (20%), and interview (40%).
The jury reserves the right to not admit a candidate if none of the candidates fulfils the requirements presented in this call.
10. **Selection Committee:** President of the jury: Professor Doctor Raquel Conceição. Alternate members of the jury: Professor Doctor Matilde Pato and Professor Doctor Pedro Almeida.
11. **Publication/notification of results:** The final results of the evaluation will become public, through ordered list *final grade obtained* which will be posted at the entrance hall of the **FFCUL**, located at the Faculdade de Ciências da Universidade de Lisboa, C1 bldg – 3rd floor, Campo Grande, 1749-016 Lisboa, and the selected candidate will be notified by *e-mail* or telephone.
12. **Deadlines:** This call for applications is open from 02/12/2016 to 16/12/2016.
13. **Application:** Applications may be sent via e-mail to rcconceicao@fc.ul.pt with the subject “BI-MESTRE: machine learning improving microwave imaging”, by attaching the following documents (in either Portuguese or English): *Curriculum vitae (maximum 4 pages)*, *Motivation Letter (maximum 2 pages)*, *Bachelor and Master certificate*, *Reference letter (maximum 2 letters)*.