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## Doctoral Fellowship – 1 vacancy

**Within the project – DIREQT2Heart**

**Ref. HR22-00533**

**Ref. nº: CCMAR/BD/33/2022**

The Centre for Marine Sciences (CCMAR) opens one (01) Doctoral Fellowship (BD) for applicants of any nationality, including stateless candidates, and holders of political refugee statute, in the scientific field of Medical Imaging and Artificial Intelligence within own revenues and the research project: “A *DIRect* *QUan*Titative assessment of Heart disease with magnetic resonance imaging.” with project reference HR22-00533 funded by Fundación Bancaria Caixa d’Estalvis i Pensions de Barcelona e a Fundação para a Ciência e a Tecnologia, FCT, through the CaixaResearch Health Call 2022 and under the following conditions:

### Host and Contracting Institution: CCMAR

This fellowship is intended for R&D activities carried out by students enrolled in a doctoral programme, at the beginning of the fellowship, with a view to consolidating their scientific training through the development of research work leading to the award of a doctoral degree.

### Work Plan, Tasks to perform and objectives:

Coronary heart disease (CHD) is one of the leading causes of death worldwide. This disease occurs when coronary arteries become narrowed by a build-up of fatty substances within the walls (atherosclerosis), which can reduce the blood flow to the heart (myocardial ischaemia). A complete blockage of an artery can lead to a heart attack. Therefore, diagnosing myocardial ischaemia prior to a heart attack is important. Quantitative perfusion cardiac magnetic resonance (pCMR) is an emerging imaging modality that enables the non-invasive detection of myocardial perfusion anomalies. However, pCMR still suffers from several limitations: low image quality, incomplete heart coverage, sensitivity to cardiac and respiratory motion (patients unable to hold their breath) and presence of dark-rim artefacts, which may be misinterpreted as ischaemia. The aim of this “la Caixa” and FCT funded PhD fellowship is to develop the next generation pCMR to generate high-resolution quantitative images of blood flow with complete heart coverage, without patients having to hold their breath.

Specifically, the fellowship holder will be involved in the following tasks and objectives:


1. Develop pCMR reconstruction and motion correction approaches to enable high-resolution quantitative pCMR, without patients having to hold their breath.
2. Develop artificial intelligence -based approaches to obtain quantitative pCMR images in a fast and reproducible manner.
3. Evaluate methods using simulated, dynamic phantom and patient data.
4. Publish articles in scientific journals and present findings at international conferences.

### Scientific Supervisor:

Doctor Teresa Correia, researcher at CCMAR.

### Work place:

The project will be developed at CCMAR’s Quantitative Bio-Imaging Lab (equipped with high-performance multi-GPU computers) at the Gambelas Campus in Faro, Portugal and includes secondment opportunities at Centro Nacional de Investigaciones Cardiovasculares (Spain), University of Valladolid (Spain), King’s College London (UK) and Instituto Superior Técnico (Portugal).

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**Requirements for the application:**

Applicants must meet all the conditions stated below:

1. MSc degree in Physics, Biomedical Engineering or other related field.
2. Experience in MATLAB, C/C++ and/or Python.
3. Fluent in English (Reading, Writing, Speaking)

Non-compliance justifies exclusion from the procedure.

**It is considered as an advantage:**

Experience in medical imaging.  
 Experience in Magnetic Resonance Imaging (MRI).  
 Experience in image reconstruction and processing.  
 Experience in machine learning techniques.  
 Experience with machine and deep learning libraries, e.g. TensorFlow, Pytorch, etc.  
 Familiar with standard deep learning architectures.

In the event of a tie between candidates during the selection process, this argument may be used to select the candidates.

**Evaluation criteria:**


Through the analysis of the application documents the evaluation criteria for the applications and their relative weight for ranking are as follows:

1. Motivation letter and CV, including publication record (50%)
2. Previous experience in medical imaging, including MRI, image reconstruction and processing (20%)
3. Proficiency with programming languages (Python and/or MATLAB and/or C/C++) (15%)
4. Previous experience in machine and deep learning (10%)
5. Fluency in English (good oral and written communication skills (5%))

The selection committee reserves the right to contact and interview candidates if additional information or clarification of any curricular aspect is necessary. In case it takes place, the interview aims to evaluate in more detail the curricular items used to grade the candidate according to the list above.

In the event that no applicant has the necessary profile, the selection committee reserves the right to close the call without any recruitment. In the event that the selected person does not take up the position because of failure to comply with documentary requirements or any other reason, or later during the contract if they resign, the jury reserves the right, upon convenience and opportunity, to assign the post to the next applicant in accordance with the ranking positions based on the selectable reservation list that can be used up to 12 months of the date of the present announcement.

**Fellowship conditions:** The fellowship will have a duration of 12 months, expected to start from January 2023 and eventually renewed for periods of 12 months or until the end of the project and up to a maximum of 48

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months. The fellowship must be carried out under an exclusivity regimen, according to the FCT Fellowship Regulation (RBI) and of the CCMAR fellowship regulations (see [here](#)) based on the Portuguese law 40/2004, of 18 of August (Scientific Research Fellowship holder statutes) amended by the Decree-Law 123/2019 of 28 of August. A maintenance allowance of 1144.64€ will be paid monthly, through bank transfer, and will be updated as stipulated by the Foundation for Science and Technology (see [here](https://bit.ly/2ZcxUGJ) <https://bit.ly/2ZcxUGJ>).

**Application period:** from 03th of November 2022 to 12th of December 2022 at 23:59 (Lisbon time, Portugal).

**Application process and mandatory documents:**

Complete applications must be submitted online at <https://www.ccmар.ualg.pt/list/job> and must include:

1. a motivation letter (in English);
2. a detailed Curriculum Vitae (in English);
3. the email contact of up to 3 referees.
4. a copy of the Master degree Certificate (if awarded by a Portuguese Higher Education Institution) or a copy of the certificate of recognition of the Master degree by a Portuguese Public Higher Education Institution or by DGES – Directorate General for Higher Education (if the degree was awarded by a foreign University).

**or**


5. the complete declaration of honour, available from the application platform, if they are unable at the time of application, to provide a copy of the Master degree certificate (if awarded by a Portuguese Higher Education Institution) or a copy of the certificate of recognition of the Master degree (if the degree was awarded by a foreign University), as indicated above;

**Non-compliance with these documents/information determines the immediate rejection of the application.**

**Results and Preliminary Hearing:** The admission and evaluation results will be communicated by email within 90 working days after the application deadline. After notification, candidates have 10 working days to contest the preliminary decision.

**Candidates holding degrees awarded by a foreign university should have their degree recognized in Portugal no later than the date indicated in the communication of selection for the position. Non-compliance justifies exclusion from the procedure. Information about the recognition procedures can be obtained at any Portuguese public higher education institution or by Directorate General for Higher Education – DGES (here <https://bit.ly/3afyQQU>).**

**Selection Committee:**

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Doctor Teresa Correia, researcher at CCMAR (President of the jury); Doctor Rita Nunes, researcher at Instituto Superior Tecnico (member); Doctor Carlos Alberola López, researcher at University of Valladolid (member) and Doctor Javier Sánchez González, researcher at Philips Healthcare (member).

#### **Notes:**

##### Hiring Documents

After the candidate is selected and for the hiring purpose the following documentation/information will be requested:

- proof of the enrolment (Certidão de inscrição/matricula) from the Academic Services in a doctoral degree course (in accordance with the declaration on honour).
- If applicable, copy of the master degree (if awarded by a Portuguese Higher Education Institution).
- If applicable, certificate of recognition of the master degree by a Portuguese Public Higher Education Institution or by DGES – Directorate General for Higher Education (if the degree was awarded by a foreign University).
- Declaration of commitment stating the exclusivity regime.
- Civil, fiscal and social security Identification (if applicable)
- Account Number – IBAN
- Ciência ID: <https://www.ciencia-id.pt/CiencialD/HomePage.aspx>
- Proof of country of residence, residence authorization, or other document legally equivalent, if applicable, in force at the time of fellowship start date.

##### Fellowship Agreement model

After the candidate selection and all information is received, it will be signed a fellowship agreement in accordance with the model [here](#)

##### Fellowship holder Assessment

At the end of each period of duration of the fellowship contract, the activity developed by the fellowship holder will be evaluated by the supervisor, by applying the following criteria, in accordance with the model below.

Criteria 1 – Technical and scientific performance (40%)

Criteria 2 – Compliance with the defined project objectives and tasks (10%)


Criteria 3 – Commitment to the project, ability and willingness to work as part of a multidisciplinary team (30%)

Criteria 4 – Ability and commitment to draft scientific activity reports/scientific papers and participate in knowledge transfer activities (20%)

Supervisor report model [here](#)

##### Fellowship holder report

By the end of each fellowship period the fellowship holder must present a report. You can find the fellowship holder final report model [here](#)

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**The board of Directors reserves the right, due to a change in circumstances at the date of the present announcement, to cancel the present call without any recruitment.**

Disabled candidates shall be preferred in a situation of equal ranking, and said preference supersedes any legal preferences. Candidates must declare, on their honour, their respective disability degree, type of disability and communication / expression means to be used during selection period on their application form, under the regulations above.

CCMAR's non-discrimination and equal access opportunities policy – No candidate can be privileged, benefited, jeopardised or be deprived of any right or exempt of any claim in regards to descendent, age, gender, sexual orientation, marital status, economic situation, origin, social economy, genetic heritage, disability, chronic disease, nationality, ethnicity, territory of origin, language, religion, politics, ideology or union membership.

Faro, October the 25<sup>th</sup>, 2022