

INESC-Coimbra is a non-profit private institute resulting from a partnership between the University of Coimbra and INESC (Institute for Systems and Computers Engineering) characterized by the interdisciplinary nature of its activities. Its researchers come mostly from the Faculty of Science and Technology and the Faculty of Economics, both at the University of Coimbra.

INESC Coimbra possesses a diversified experience in R&D activities, involving many projects under contract (with the Foundation for Science and Technology, the European Commission, the Portuguese Administration, several Local Administrations, and companies in energy and telecommunications sectors), as well as advanced educational programs (support to post-graduate, master's and doctorate programs).

Information about the past, recent and current research projects in which INESCC has been involved can be found in the Website of the institute (<http://www.inescc.pt/>).

By this announcement, INESCC intends to hire one Post-Doc Researcher for a five years maximum period, depending on the approval of the corresponding place by the Portuguese Foundation for Science and Technology (FCT) and in accordance to the rules of Ciência 2008 Program. The selected candidate will develop research work in the area of linear and mixed integer linear programming problems applied to radiotherapy treatments.

The applicant will join Inesc-Coimbra and will mainly work on combinatorial optimization problems applied to radiotherapy planning treatments. Planning a radiotherapy treatment is a very difficult task. After receiving the medical prescription it is necessary to define several parameters that are dependent on the patient and on the technical devices available. Usually this planning is based on a trial and error basis.

The problem that the applicant will work on is one of inverse engineering. The problem of inverse engineering can be applied to several different types of radiotherapy treatments: conformal therapy, IMRT, BGRT, IGRT, Gamma Knife, brachytherapy. The objective is to be able to deliver a treatment to the patient with results that are as similar as possible to the medical prescription. To achieve this, one can develop and optimize linear programming models that have as solutions the optimal planning (number of beams, their orientations and intensities, for instance). This field of research can lead to significant improvements, both for health institutions and patients: decrease of the planning time, increase on the number of patients treated, increase in the treatment quality (better disease control and better quality of life for the patient).

The applicant will work on the development of mathematical models, resolution algorithms (both exact and heuristic), and applications to real data. The applicant will be the main link between the research center and health institutions.

The candidate is expected to present the research work developed in national and international conferences, and to submit papers to international scientific journals. The

candidate should also be willing to participate in ongoing projects, in the supervision of master or PhD students and other young researchers, in the preparation of proposals to R&D projects both at national and international levels.

The applicant should have the following profile: at least 3 years of post-doctoral research, significant research in mixed and integer linear programming problems, excellent programming skills, excellent written and spoken English. In exceptional cases, duly justified, FCT may consider accepting applicants with less than 3 years of post-doctoral experience.

The contractual conditions are in accordance with the program Ciência 2008.

Candidates should send the following documents in pdf format to secretaria@inescc.pt no later than the 30th September 2008:

- a) An application letter addressed to the Director of Inesc;
- b) Curriculum Vitae;
- c) Statement of motivation/commitment for application;
- d) At least one letter of recommendation.

More information regarding this vacancy can be requested by email to joana@fe.uc.pt.

This announcement can be found in

<http://www.eracareers.pt/opportunities/index.aspx?task=global&jobId=10420>.