Post-doctoral research position
at LTSI (INSERM /University of Rennes 1), France

The MediCIS/LTSI lab, INSERM/Université de Rennes 1 seeks a post-doctoral research fellow, in the context of the EU/EURATOM MEDIRAD project " Implications of Medical Low Dose Radiation Exposure".

Context

MEDIRAD is a large EU project (2017-2021) that aims « to enhance the scientific bases and clinical practice of radiation protection (RP) in the medical field and thereby addresses the need to understand and evaluate the health effects of low dose ionising radiation exposure from diagnostic and therapeutic imaging and from off-target effects in radiotherapy (RT) ». It includes several workpackages (WPs) addressing various important research questions pertaining to the estimation, registration and optimisation of radiation doses, to the understanding of the effects of medical exposures (including cancer and non-cancer risks), to the development of science-based policy recommendations for effective protection of patients and workers.

In this project, LTSI is in charge (together with several partners) of developing a « European repository of patient dose and imaging data ». This repository will be built and deployed to collect images and radiation protection-related metrics to support research projects in the medical imaging domain (subtask 2.4.1). This system will be composed of 3 basic components: (1) a DICOM repository (based on a PACS software), that will receive and store the DICOM data : i.e. medical images, dose data such as Radiation Dose Structured Report (RDSR), as well as technical and medical information concerning the images; (2) a DICOM import software (based on the DICOMweb standard) that will enable selecting the data on the client's side, ensure de-identification and on-the-fly lossless compression, and send data to the central DICOM repository ; (3) a semantic (i.e. RDF) repository for non-DICOM image and dose data. The latter includes dosimetric data that is needed by MEDIRAD researchers but not currently standardized in DICOM (such as patient organ doses and related provenance data).

Work to be done

The candidate will participate in the design of the semantic (i.e. RDF) repository and of its integration in the overall dose and image repository. This work involves the following aspects : 1) analysis of the requirements from MEDIRAD researchers ; 2) Modeling of information to be stored in the repository ; 3) Design of the ontology, especially extraction of relevant terms from existing ontologies (e.g. FMA, SNOMED CT, RadLex) ; 4) Design of application software to create RDF instance data from DICOM image metadata and ad-hoc descriptions of dosimetric data provided by the various dose computation software ; 5) deployment of a RDF triple store ; 6) integration and testing.

Work location

The candidate will be integrated into the MediCIS team of the LTSI (Laboratory of Signal and Image Processing), located at the Faculty of medicine of Rennes. This work will involve collaboration with several MEDIRAD partners, especially in Geneva (Switzerland), University of Crète (Greece), Mainz (Germany) and Rennes (France). For more information about MediCIS / LTSI, please visit the MediCIS website: http://medicis.univ-rennes1.fr

Qualification needed

The candidate should have a PhD degree and a strong background in computer science, database (SQL) and semantic web technology (i.e. RDF/RDFS, OWL, SPARQL). Some knowledge in medical imaging and DICOM is welcome. Solid programming skills are required. Other required qualities are : ability to work in a collaborative environment, fluent english, good communication skills, interest for the medical domain.

Position and salary

The fellowship position is funded for 24 months, starting in September 2017. The employer will be INSERM, the French National Institute for Health and Medical Research.

Salary is commensurate with the candidate's experience according to the French government pay scale – about 2000 euros per month. It includes health insurance and 5 weeks paid vacation per year. More information available at : https://rh.inserm.fr/Documents/Inserm_MobiliteInternationale_Guide.pdf

How to apply

Please send application to: Bernard Gibaud, INSERM, email : bernard.gibaud@univ-rennes1.fr , including :
- CV with details of education and work experience
- Letter of interest
- List of publications.

Keywords

imaging biobank, radiation protection, image databases, ontologies, semantic web, medical imaging, DICOM standard