OSPEDALE SAN RAFFAELE

Postdoctoral position in preclinical minibeam radiotherapy

The Medical Physics Department and the Experimental Imaging Centre of the San Raffaele Scientific Institute in Milan are searching for a highly motivated postdoc for a recently founded project on preclinical minibeam radiotherapy.

Project overview

The main goal of external beam radiotherapy (RT) is to increase the tumor control probability reducing at the same time the normal tissue complication probability. The RT therapeutic window may be improved using different approaches. In particular there has been a recent interest in investigating the use of FLASH radiotherapy using ultra-high dose rates or micro/mini beams radiotherapy (MBRT).
The MBRT approach is based on the use of small parallel beams of radiation with a peak/valley dose pattern; the size of the beams can range from a few microns up to hundreds of microns.
The main goal of the project is the development, optimization, dosimetry verification and testing on animals of collimation systems for the generation of mini-beams to be delivered by a last generation image-guided small animal irradiator.
The project could also contribute massively to move forward in the MBRT field; the future clinical use of MBRT has disruptive potentials to reduce toxicity allowing to increase the dose for radiation resistant tumors.

Key skills and experience of the ideal candidate:

- The position requires a Ph.D. preferentially in medical physics
- Knowledge of preclinical radiotherapy
- Knowledge of Monte Carlo Simulations (e.g. Topas)
- Willingness to work in a multidisciplinary environment
- A good knowledge in spoken and written English

For more information please contact:

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OSPEDALE SAN RAFFAELE

Milan, 15 November 2022

Post-medical physics graduation/Postdoctoral position in Digital Pathology

The Medical Physics Department of the San Raffaele Scientific Institute in Milan are searching for a highly motivated graduated in Medical Physics/postdoc for a recently founded project on Digital Pathology.

Project overview

Histopathological diagnosis, the grand-truth standard for detecting prostate cancer in biopsies, is time consuming and subjected to the pathologist's expertise and interpretation criteria. Digital pathology (DP), with the use of whole slide imaging (WSI) may allow the support of computer-aided diagnosis systems (CAD) which could increase the level of diagnostic accuracy and turn-around time. However the available approved CE-IVD CADs are not completely validated with heterogeneous routine series of digital slides (DS) obtained by different institutions. Quality control (QC) processes of DS are usually performed manually and consist in the removal of poor quality slides or avoiding the analysis of tissue regions containing artifacts. This process is subjective, labor intensive, error prone, and raises concerns from a scientific reproducibility standpoint.
Our project aims to estimate the feasibility of a digital pathology multi-Institution workflow in real life, focusing on the diagnosis of prostate biopsies, by evaluating the inter/intra-reader concordance with/without CAD support, and to create a Federated-Learning (FL) Quality Assurance platform to exchange the inter-center knowledge. This will be addressed using HistoQC, an open source tool that employs a combination of image metrics, functionality and supervised classifiers, capable of measuring slide quality and identifying the presence of artifacts. Using HistoQC, we will study the impact of DS quality on the outcome of the readings made by pathologists and CADs. The quality indicators extracted will be also used to train the AI models of the QA platform. DS quality will also be analyzed with radiomic techniques (Pathomics).

Key skills and experience of the ideal candidate:

- She/he should be a physicist, preferentially graduated in medical physics or with PhD
- Experience in image processing and analysis, preferentially with medical images
- Experience in CADs, AI and with computational skills
- Willingness to work in a multidisciplinary environment
- A good knowledge in spoken and written English

For more information please contact:

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