

Post-doc position - 12 months

Investigation of tumor and organ motion with internal X-ray images and external thorax surface acquisition in radiation therapy

Context

The position is within the ULICE (Union of Light Ion Centers in Europe) European project. We are participating to the WorkPackage 4 named "Ion therapy for intra-fractional moving targets". The proposed work is a collaboration between CREATIS laboratory (CNRS) in Lyon, Politecnico di Milano, Italy and the IBA company. The position is for 12 months. See <http://www.creatis.insa-lyon.fr/site/en/node/43162>

Goal and tasks

Breathing motion leads to issues in lung cancer radiation therapy treatments, with risk of potential tumor under-dosage or too much irradiation of organs at risk. Recent delivery techniques such as scanned ion beam that can control the beam direction with magnet are promising to track tumor. However, precise analysis of tumor and lung motion and deformation during a treatment session is required. Several multimodality imaging devices can provide respiratory motion information during thoracic cancer treatment: 4DCT, CBCT, optical devices. Combining these modalities should allow to provide useful information towards evaluating the feasibility of tumor tracking in particle therapy.

We have created a database (DB) of anonymized patient data from several modalities, with in particular synchronized internal & external information. Such a DB will be useful for researchers to analyze correlation and variability of respiratory motion as acquired with different image modalities (pre-treatment, in-room, per-treatment). The DB contains 4D CT images (planning), CBCT images for each treatment session and VisionRT dynamic surfaces.

Thanks to this database, the tasks of the recruited person will first be to evaluate the tumor base-line-shift between the CT and motion-compensated CBCT reconstructed at time averaged mid-position. Then, the thorax patient mid-position surface of the CBCT data will be correlated with mid-position surface build from the VisionRT dynamic surface in order to investigate the variability of such surface during a treatment session. Internal/external correlation will be performed in collaboration with the Italian team.

- **Skills:** The candidate must hold a PhD in medical imaging or radiation physics • Programming skills (C++) • deformable image registration • radiation therapy / X-ray imaging • English or French language
- **Location:** CREATIS laboratory / CLB cancer treatment and research center, Lyon, France
- **Salary (gross):** 2000 – 2500 € /month (depending on experience)
- **Duration:** 1 year, starting: before end 2011.

Contact:

Send CV by email to:

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Warning: we start to receive applications from July. There will be two rounds of interviews, one end of July and one in September. Please don't expect a prompt reply in August due to holidays. According to the number of applicants, the final decision is expected around September for a start October/November 2011.