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Post-doc position - 24 months in Lyon, France

Ultra-Sound guided prostate radiation therapy treatments

Context

The position is part of a collaboration between the Léon Bérard cancer center (CLB), the CREATIS laboratory (CNRS) and the Elekta company. The position is for 1 year and can be renewed at least 1 year. The work will be held in Lyon, partly at the CLB and partly at the CREATIS lab (Doua Campus). The recruited person will work in collaboration with a PhD student. See http://www.creatis.insa-lyon.fr/site/fr/node/43163

Medical and scientific context

The internal movements occurring during radiotherapy are a major constraint when treating some mobile tumors especially in case of prolonged treatment delivery. In modern radiotherapy, with the current development of image guided radiotherapy techniques (IGRT), higher doses of radiation are used in dose escalation studies in an attempt to improve clinical outcomes (hypo-fractionated radiotherapy). These treatments are more sensitive to organ motion. Therefore, it is essential to enhance the accuracy of both target delineation and dose delivery. This could be beneficial for the patients since the treatment security margins could be reduced and the secondary side effects minimized.

The Elekta society develops an IGRT-US system (Clarity®) with an innovating modality using a trans-perineal probe (TPUS) to acquire dynamic US images for IGRT-US in pelvic cancers. The main interest of TP acquisitions is that the probe can be used during the irradiation sessions, since its position does not interfere with the beam delivery. This approach should lead to the emergence of adaptive radiotherapy in pelvic cancers, especially tracking modalities with the advantage of being a non-invasive and non-irradiating technique compared to other modalities. The CLB will acquire this system.

Goal and task

More than one third of patients with localized prostate cancer at diagnosis who receive radical prostatectomy have histologically extraprostatic disease and significant benefit of postoperative radiotherapy has been shown. In this project, we will focus on this situation. Because the prostate is removed, the main challenge will be to track in the US images the deformable organs surroundings the prostatic surgical bed (bladder, rectal wall, seminal vesicle, etc.). The following is a potential list of tasks:

- Deformable registration algorithm between the planning CT image and a US reference acquisition,
- Registration between the US reference acquisition and the US acquisition at the time of treatment,
- Organ tracking in the US sequence acquired during treatment ; ideally in real time.

Misc

- **Skills:** The candidate must hold a PhD in medical imaging or radiation physics • Programming skills (high level C++) • Experienced in (deformable) image registration • Ideally knowledgeable of radiation therapy, US & X-ray imaging • English required, French optional
- **Location**: CREATIS laboratory (“la Doua” Campus) & Léon Bérard cancer (28 rue Laennec, 69008) – Lyon - France
- **Salary (gross)**: 2000 – 2500 € /month (depending on experience)
- **Duration**: 1 year, renewable at least 1 year. Starting: early 2012.

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/October for a start end 2011 or early 2012.