PhD or Postdoctoral Position in Point Cloud Processing and Surface Reconstruction for Augmented Reality in Surgery

The department of Electronics & Informatics – Vrije Universiteit Brussel (VUB) is looking for a highly motivated researcher with interest in point cloud processing and surface reconstruction for augmented reality (AR) applications in surgery. The position is open for both starting PhD students and postdoc level applicants, preferably with relevant experience in deep learning-based processing of point clouds. The opening is in the context of the AIM project on Automated Intraoperative Measurements for AR-Guided Surgery and organized between the departments of orthopedic and neurosurgery of the University Hospital Brussels (UZ Brussel), and the Department of Electronics and Informatics ETRO of the Vrije Universiteit Brussel (VUB). Within the AIM project, collaboration with industrial partners (Materialise, ORSI and Cronos) is foreseen.

The project focuses on AR-based methods for guidance, navigation and quantification during surgery. A prototype for highly accurate AR guidance through visualization of preoperative imaging has previously been developed within the UZ Brussel-VUB consortium (https://vimeo.com/466559886). We aim to extend the functionality of latter system by adding markerless tracking and assessment of relevant structures combining several sensor outputs. The obtained point clouds will be processed using state-of-the-art neural networks and transformers. The developed tools will be tested in preclinical and clinical experiments for cranio-maxillofacial, orthopedic, and neurosurgical procedures.

The selected candidate will be mainly responsible for the development of the novel point cloud processing methods. We are preferably looking for candidates with prior experience in deep learning in point cloud processing. The researcher will also contribute to the further development of the AR applications, the experimental testing of the AR guidance, the preparation of manuscripts for publication, lead and mentor students, and aid in the teaching of the department (limited).

Requirements:

- Master’s degree in computer science, biomedical engineering, electronics and informatics engineering, or related field.
- (Optional) PhD in computer science, biomedical engineering, electronics and informatics engineering, or a related field.
- Experience in programming (Python, C#, C++, etc.) for machine learning and signal processing.
- Candidates with research experience on deep learning and/or point cloud processing will be privileged.
• Knowledge of general signal and image processing, and machine learning is considered an asset.
• Strong writing skills, preferably demonstrated by peer-reviewed publications.
• Strong interpersonal, organizational, and mentoring skills.
• Keen interest in biomedical and AI research. The main research areas relevant for this position are medical image analysis, image-guided therapy and interventions, machine learning, image and signal processing.

Offer
We offer a position for two years (extendable to 4 years), in an inspiring, challenging and flexible research environment. You will join a dynamic team of developers, researchers, post-docs and professors; and closely collaborate with medical physicists and medical doctors. We offer the possibility to follow various advanced training courses in Belgium or abroad.

You will be hired at ETRO, and your main place of work will both ETRO on VUB campus Etterbeek (Pleinlaan 2, 1050 Brussel), and UZ Brussel on VUB campus Jette (Laarbeeklaan 101, 1090 Brussel). You will receive a competitive salary with additional benefits covering holiday pay, hospital insurance and public transport; and generous holiday entitlement. The position is available immediately.

About IMEC-ETRO-VUB and UZ Brussel
ETRO, the department of Electronics and Informatics (http://www.etrovub.be/) of the Vrije Universiteit Brussel (VUB) performs fundamental and applied research in Micro- & Optoelectronics, multidimensional signal processing, and audiovisual computing. We are a core member of IMEC, the world-leading research and innovation hub in nano-electronics and digital technologies. Our team is currently a fruitful mixture of people from different nationalities. The main working language is English.

ETRO closely collaborates with UZ Brussel, the university hospital of the VUB, a top-rated medical institute that has gained recognition at national and international level. UZ Brussel conducts both fundamental and translational clinical research in a large variety of biomedical domains.

Applications should include detailed resume and a motivation letter
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Further information
http://www.etrovub.be/
http://www.uzbrussel.be/
http://www.imec.be