UNIVERSITÄT BERN

PhD Position in Biomedical Engineering
Medical Image Analysis and Surgical Planning based on Artificial Intelligence (100%)

Location: Bern, Switzerland

Description

The Personalised Medicine research group of the sitem Center for Translational Medicine and Biomedical Entrepreneurship at the University of Bern is offering a PhD position in the research and development of artificial intelligence (AI) algorithms for anatomy modelling and anatomical analysis.

The PhD candidate will work within our multinational team and in close collaboration with our industrial, research and clinical partners, towards a cutting-edge software system for the diagnosis, surgical planning and outcome prediction of shoulder pathologies. They will build on deep learning-based algorithms to investigate clinically applicable segmentation solutions for the purpose of tissue composition and morphological analyses, patient specific biomechanical surgical outcome simulations and radiomics-based analysis of treatment outcome success. The student will work within a highly motivated team of experts at the sitem Center and interface with imaging physicists, surgeons and neurologists from the University Hospital of Bern, biomechanical engineers from ETH Zurich and industrial partners.

Your tasks

As a PhD candidate, you will conduct applied research in the field of image based surgical planning. The candidate will investigate methods based on AI for the delineation of anatomical structures from MRI and CT images, investigate AI methodologies for image domain adaption as well as investigate radiomics approaches to surgical outcome prediction. The PhD candidate will also be responsible for developing clinically applicable solutions from research outcomes to enable clinical validation of the solutions. Specific tasks of the PhD candidate will include:

- Investigate and develop automatic anatomy segmentation algorithms for musculoskeletal structures from MRI and CT image data
- Investigate and develop automated methods for calculating diagnostic parameters from MRI and CT image data
- Investigate and develop methods for surgical outcome prediction based on radiomics
- Develop a fully integrated clinical applicable software system for diagnosis, surgical planning and outcome prediction
- Work with biomechanical engineers to develop and integrate surgical planning optimisation methods
- Clinically validate developed algorithms and systems

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Your profile

We are looking for a dynamic, ambitious and self-motivated candidate with a Master of Science in Biomedical Engineering, Software Engineering, Computer Science or similar. Candidates with a strong background in software development and image processing are particularly encouraged to apply. The candidate must be fluent in written and spoken English.

The following attributes will be highly valued:

- Knowledge in AI technology (TensorFlow, PyTorch, etc.)
- Programming experience in Python and C++
- Experience working with clinical partners or in multidisciplinary teams
- An understanding of basic biomedical principles
- Problem solving, reasoning, organisation, planning and analytical skills

We offer

- A unique doctoral position in a highly interdisciplinary team
- A meaningful applied project at the forefront of surgical technology
- The opportunity to present results in scientific journals and at international conferences
- Entrepreneurship opportunities and the possibility to follow entrepreneurial studies at the sitem-insel School if desired
- The opportunity to collaborate with the medical technology industry, applied researchers and physicians
- A well-defined accompanying PhD curriculum, managed by the local graduate school (www.gcb.unibe.ch)
- State-of-the art facilities in the brand new sitem-insel building with close proximity to clinical partners at the University Hospital of Bern
- A pleasant working environment in a city that is ideally located in the middle of Switzerland and Europe, offering rich cultural and outdoor activities and a high quality of life
- A fully funded position for 3 years (salary according to the Swiss National Science Foundation, www.snf.ch)

How to apply

Please send an application letter and CV addressed to Dr. Kate Gerber (kate.gerber@sitem.unibe.ch). Applications may be considered until the position is filled.
The University of Bern is an equal opportunity employer. Qualified female candidates are especially encouraged to apply.