

PhD position in medical signal and image analysis

Position: PhD student position in medical signal and image analysis

Supervisors: Prof. Henning Müller (Machine learning) and Dr. Hedjoudje Abderrahmane (Neuroradiology)

Project Title: A Full Pipeline to Automating Clinical Ischemic Stroke Assessment and Course by Processing Images and Biosensor Data using Machine Learning Approaches

About the Position:

We are seeking a highly motivated and talented PhD student to join our collaborative research team and work on an exciting project aimed at developing a full pipeline for automating clinical ischemic stroke assessment and predicting clinical course using advanced machine learning techniques. The project involves processing and analyzing neuroimaging data from various modalities and integrating them with biosensor data to aid in early stroke diagnosis, treatment planning, and prognosis.

Responsibilities:

- Regularly reviewing the existing literature on stroke diagnosis and prognosis with machine learning to build a strong foundation for the research.
- Data collection and preprocessing: collaborate with clinical partners to gather multimodal neuroimaging data (MRI, CT, etc.) and biosensor data from stroke patients. Preprocess and curate the data to ensure high quality.
- Algorithm Development: Design and implement machine learning algorithms, including but not limited to deep learning, convolutional neural networks (CNNs), to analyze neuroimaging and biosensor data.
- Model Training and Validation: Train machine learning models using the collected data and perform rigorous validation to ensure high accuracy, sensitivity, and specificity.
- Integration of multiple modalities: Develop a comprehensive pipeline that seamlessly integrates multiple data modalities and machine learning models to provide a holistic stroke assessment and prognosis system.
- Ethical Considerations: Ensure compliance with ethical guidelines and patient data protection regulations throughout the research process.
- Collaboration and Communication: Work closely with Dr. Hedjoudje Abderrahmane, Prof. Henning Müller, and other team members to share progress, discuss findings, and collaboratively solve challenges.
- Publication and Dissemination: Prepare research findings for publication in reputable journals and present them at relevant conferences and workshops.

Qualifications:

- A master's degree (or equivalent) in a relevant field such as medical imaging, computer science, biomedical engineering, or a related discipline.
- Strong background and experience in medical image analysis, machine learning, and data analysis.
- Proficiency in programming languages commonly used in machine learning, such as Python, and frameworks such as TensorFlow, and/or PyTorch.
- Experience with working on medical imaging datasets and familiarity with common medical imaging formats (DICOM, NIfTI, etc.).
- Excellent analytical and problem-solving skills, with the ability to think creatively and critically.
- Effective communication skills, both written and verbal, to collaborate with a multidisciplinary team and present research findings.

Qualifications that are clearly a plus:

- Previous experience with stroke-related research or neurodegenerative diseases.
- Knowledge of medical image segmentation
- Familiarity with handling biosensor data and wearable devices.
- Experience with cloud computing platforms and parallel processing.

The position is a full-time PhD research position with an expected duration of 4 years. The research will be conducted at Hospital of Valais and located in [Sion, Switzerland] and the HES-SO Valais located in [Sierre, Switzerland]

Benefits:

The successful candidate will have access to state-of-the-art research facilities, mentorship from experienced researchers and opportunities for academic and professional development. A competitive stipend and funding for conference attendance will be provided.

Application Process:

Interested candidates should submit their application, including a CV, a cover letter detailing their research interests and relevant experience, academic transcripts, and contact information for at least two academic referees.

Please send applications to Hedjoudje Abderrahmane (Abderrahmane.Hedjoudje@hopitalvs.ch) and Henning Müller (henning.mueller@hevs.ch)