

PhD student in clinical AI/ML for Sepsis

The Clinical Data Science **group** led by Prof. Jean-Louis Raisaro at the Biomedical Data Science Center at the Lausanne University Hospital (CHUV) and the University of Lausanne (UNIL) is looking for highly motivated **PhD students who will work on projects in AI/ML related to sepsis** in collaboration with the team of Dr. Sylvain Meylan at the Infectious Diseases Department at the CHUV.

About us

The mission of the **Clinical Data Science** group is to develop new AI/ML-based approaches that can be translated and used in clinical settings to support safe decision making based on multimodal routinely collected clinical data from the hospital electronic health record (EHR) system. Topics of special interest include modeling multimodal patient trajectories as a basis to develop task-specific trustworthy downstream models for aiding clinicians in better and more timely diagnosis such as detection of sepsis, prediction of hospital-acquired complications or other clinically relevant phenotypes. We also study and develop large foundation model for hospital-specific applications that can streamline processes and reduce the administrative burden of healthcare professionals. Our group is part of the Biomedical Data Science Center (BDSC), a service, education and translational research platform joint between the Lausanne University Hospital (CHUV) and the Faculty of Biology and Medicine of the University of Lausanne (UNIL). Through its collaboration with the Faculty of Biology and Medicine of the UNIL and the EPFL, CHUV plays a leading role in the areas of medical care, medical research and training.

Proposed project

Title: Real-time modelling of multimodal sepsis trajectories for early detection across age groups with artificial intelligence

Abstract: Sepsis, a life-threatening organ dysfunction caused by a dysregulated host response to infection, presents significant challenges in early detection and accurate diagnosis due to its complex and heterogeneous nature. With an estimated 50 million annual cases and 11 million annual deaths worldwide, it is a leading cause of morbidity and mortality. This project seeks to address these challenges by creating robust and trustworthy AI/ML models that can identify sepsis at an early stage and predict its progression, thereby improving patient outcomes and reducing mortality rates. The candidate will devise new AI/ML methodologies based on e.g., graph representation learning, multimodal AI, and/or generative modeling and tailor these methodologies to investigate sepsis and its different endotypes. He or she will collaborate with clinicians, data scientists and IT specialists and apply these methodologies on real world clinical data from CHUV electronic health record system and other datasets available to the group through established collaborations with other Swiss and international hospitals.

The candidate will work collaboratively in a young and dynamic team of clinicians and AI/ML researchers. He or she will disseminate scientific findings through publications and conference presentations.

Required profile

- M.Sc. in Computer/Data Science, Bioinformatics/Biomedical Informatics or related.
- Computational background in AI/ML.
- Experience in working with clinical datasets is a strong plus.
- High intrinsic motivation and scientific curiosity.
- Programming skills in Python and practical experience with PyTorch or similar.
- Excellent analytical, communication and organizational skills.
- Capacity to work collaboratively within the group, but also to progress independently.
- Fluent in English – French is a plus.