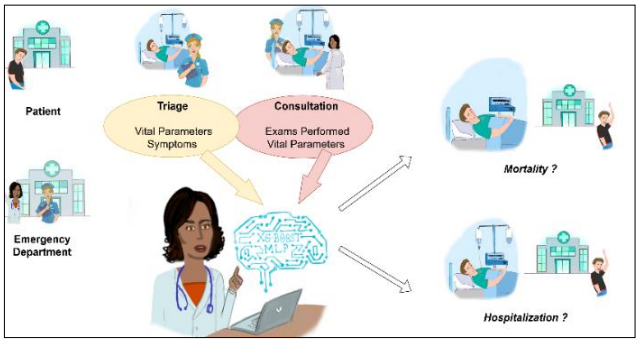
University of Basel
Department of
Biomedical Engineering

University of Basel, Department of Biomedical Engineering, Hegenheimermattweg 167c, 4123 Allschwil

Master of Science – Biomedical Engineering, Thesis Proposal

Development of a user-friendly Application for a machine learning algorithm to predict the need for Hospitalization in Emergency Department patients.

Emergency Department (ED) crowding has become more critical over the last few years. We established a project in close collaboration with our clinical partners to improve patient flow through the ED and predict the resources needed.



This Master's thesis aims to bring our algorithm to the users in the ED. It consists of developing a desktop application that allows clinicians to submit the measurements to the tool easily, use the predictions, and ensure the algorithm's interpretability. The first step is to write a demand to the ethics committee to approve your Master thesis project to be allowed to access the patient data. Then, your task is to find a way to make our models applicable to clinicians. You will have to present the solutions and see how the application can be useful for them. The algorithms need to be as 'readable' for the medical professionals as possible. This can be achieved by finding a nice way to present the weights of each parameter on the algorithm or by developing an explanation for them on how the algorithm came to this conclusion. This part of the project will be developed together with you, depending on your specific competencies and background.

Nature of the Thesis
Administrative: 20%, Programming: 40%, Interaction with clinicians: 20%, Documentation: 20%

Specific Requirements
- Good programming skills (Python), ideally experience in application development.
- Good communication skills and openness towards the needs of professionals of other domains
- German understanding or openness towards languages (Ethic's documents are so far in German)

Group Leader / Supervisor
Prof. Dr. Philippe Cattin (Group Leader), *Center for medical Image Analysis and Navigation (CIAN)*
Dr. med. Annette Mettler (Supervisor)*, Center for medical Image Analysis and Navigation (CIAN)*

Collaborators
Prof. Dr. med. Christian Nickel, *Emergency Center, Universitätsspital Basel*

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