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Philips Group Innovation, Research
High Tech Campus, Eindhoven

Master graduation project – Clinical data analysis

Start date: September 2012

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Organization Description:
Philips Research is the source of many advanced solutions in Healthcare, Lifestyle and Technology. Building on nearly 100 years' experience in industrial research and our world-leading patent position, we're dedicated to meaningful innovations. This student project is placed at the High Tech Campus in Eindhoven, in the research department Healthcare Information Management.

Background assignment:
Healthcare costs are increasing, putting a growing burden on society. One of the major costs is formed by re-hospitalizations, of which a large portion is believed to be preventable. Reducing these excessive hospital readmissions is a leading topic in clinical research worldwide. In order to optimize treatment to reduce readmission rates, it is important to develop precise risk models that predict individual patient's risks.

One of the areas of high readmission rates is formed by patients with acute Myocardial Infarctions, or heart attacks. Acute Coronary Syndrome (ACS), the intermediate diagnosis for patients entering the hospital with such symptoms, is the focus of this research. Patients with ACS typically enter the hospital with chest-pain, tests are performed, data gathered and a clinician performs a further diagnosis and decides on the treatment. Making the correct diagnosis in an early stage is of vital importance, as rapid corresponding treatments increase survival rates significantly. Optimal in-hospital treatment and follow-up care should be personalized to the needs of the patient in order to minimize the risk of deterioration and re-hospitalization. They are, ideally, based upon clinical risk models that can be applied in a clinical decision support system.
An extensive clinical dataset on ACS patients is available, covering a wide variety of clinical parameters over time. An initial analysis has been performed taking into account a limited set of single point measures. The effects of changing parameters over time should be further explored and more parameters taken into account in the data analysis.

Assignment:
Starting from the initial analysis, through an incremental way of working, the analysis should be expanded, leading to better performing clinical risk models. This includes all aspects of data analysis: data cleaning, feature extraction, parameter selection, statistical analysis, application of machine learning techniques, and validation.

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The student will benefit from supervision by experienced researchers. Moreover, the collaboration with the responsible cardiologist will guarantee clinical relevance of the work performed.

Duration: ~ 9 months.

Your Profile:

- Have a background in computing science / artificial intelligence
- Experience in performing data analysis (statistical and machine learning techniques)
- Have a drive to push the boundaries of clinical data models
- Willingness to learn about cardiology and ACS
- Motivated and able to execute a research project independently
- Fluent in oral and written English

Creativity, commitment, a proactive attitude and own initiatives are important. Students will work under guidelines applying at Philips Research in Eindhoven on a temporary contract. Students living and studying in the Netherlands will receive a monthly allowance for a graduation project. Students do not get a contribution in travel costs. For students from abroad, other rules apply.