

Job description

Entorn empresarial: Hospital Sant Joan de Déu

Entorn Acadèmic: Universitat Pompeu Fabra

Municipi: Esplugues de Llobregat

Ambits: LS7 Prevention, Diagnosis and Treatment of Human Diseases - PE6 Computer Science and Informatics -

Titulació requerida: Master in Biomedical, Data Science, or Informatics Engineering or equivalent.

Hospital Sant Joan de Déu is a large pediatric hospital in Barcelona. Yearly, hundreds of children are hospitalized with cardiac problems, either to undergo surgery for correcting congenital heart disease or related to heart failure. To ensure optimal care and patient wellbeing, while still being cost efficient, it is crucial to assess at each moment, the risks of a hospitalized patient in order to assign the appropriate care as well as to allow the patient to go home as soon as possible. This is the objective of the eCARE-Cardio project that the hospital has recently started.

Pediatric cardiac patients are at higher risk of hemodynamic deterioration either due to their underlying pathology or due to the cardiac surgery. In current clinical practice, the clinical deterioration in hospitalized pediatric patients is detected, in most of the cases, when it has already occurred. However, with a proper continuous monitoring of the patients and with the integration a multitude of variables (clinical, imaging, lab, etc.) by means of artificial intelligence (AI) based algorithms, we could predict the patient's risk of clinical deterioration before it occurs. Therefore, the aim of the eCare-Cardio project is to develop an AI based predictive system that allows us to anticipate the risk of deterioration of pediatric cardiac patients admitted to the hospital and, at the same time, to develop a personalized treatment thus improving both the efficiency of the treatment and the satisfaction of the patient and his/her family. To do that, the Hospital has created a data lake where all relevant clinic information, as well as physiological monitoring signals and cardiac images, are aggregated in a dedicated cloud.

The objective of this doctorate is to develop and implement visual analytics tools for the integration and presentation of all the information available of individual pediatric cardiac patients (monitoring, clinical, imaging as well as laboratory data) to the clinicians and nursing staff. This includes also machine-learning (ML) based feature extraction, user-friendly visualization tools as well as ML based personalized risk assessment based on information similarity and disease-specific patient comparison, for improving clinical decision making.

The plan is to have a working demonstrator available in clinical practice by the end of the project.

Requirements

Si t'interessa l'oferta, omple el pdf del següent link:

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