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Final Year Project

Analysis of a Large ICU Database for Prediction of Sepsis

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BACKGROUND

Electronic health record (EHR) is a systematic and organized record of health information of individual patients that is generated and maintained at a health provider's site. The analysis of thousands of EHR can provide various views of health care and critically ill patients admitted to intensive care unit (ICU) generate large amounts of data, because data types may be collected continuously (such as ECG) or hourly (such as vital signs or urine output)[1]. Automated system that support the analysis of risk for individual patients and medical decision making can help improve the diagnosis and treatment of ICU patients and ultimately result in better medical outcomes.

MIMIC-III ('Medical Information Mart for Intensive Care') is a large, single-hospital database of ICU patient data. [2]The MIMIC III data are available in multiple comma-separated values (csv) tables that can be as large as 4 GB. Preliminary analysis indicates that data has inconsistencies and errors that are not previously reported.

OBJECTIVES

- Perform the survey of the state-of-the-art solutions for clinical analytics in the ICU environment.
- Develop and implement a method for cleaning of ICU data.
- Develop interface for ICU data analytics.
- Perform a demonstration example of Big Data analytics on ICU data – prediction of sepsis

DESIGN

CHALLENGES

- The data is disordered and many data is redundant, in this case a lot of work should do manually to simplification them.
- Sepsis is complex and as a unprofessional medical expert, it is hard to acknowledge it.
- This software is big and handling it is difficult.

REFERENCE

1. Zhang Z. Big data and clinical research: focusing on the area of critical care medicine in mainland China. Quantitative imaging in medicine and surgery. 2014 Oct;4(5):426.

2. Johnson AE, Pollard TJ, Shen L, Li-wei HL, Feng M, Ghassemi M, Moody B, Szolovits P, Celi LA, Mark RG. MIMIC-III, a freely accessible critical care database. Scientific data. 2016 May 24;3:160035.

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