



Name Entity Recognition of Patients in MDOP (the Medical Device Operational Platform)

Project Management and Software Development
for Medical Applications

General Info

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Project Abstract

Hospitals collaborate with multiple medical device manufacturers. From the operating room to radiology, different vendors provide tools and equipment for the medical staff to conduct their work with. MDOP aims to provide a universal solution that connects all devices into a well-organized system by using NFC tags and QR code technologies. Two of the most valuable features of MDOP are the chat and forum functionalities (the forum functionality is still under development).

Background and Motivation

Hospital management is quite an extensive process that is designed to organize and optimize hospital resources (staff, doctors, patients, devices, etc.). Among the most important resources that any hospital depend on nowadays are the medical devices and tools used to perform day-to-day tasks such as surgeries, scans, and others.

Considering the multitude of medical devices, hospitals are still facing an issue when it comes to optimally training new staff or refreshing the knowledge of the more experienced staff on new devices.

Hospital staff should have quick and easy access to communicating about devices and ask questions on how to use them or who to ask for help in case of

an inquiry. However, patient information data always needs to be protected and since patient names might be mentioned while talking to another colleague, an intelligent system should be set in place that can detect a patient name before it was posted in a forum or sent via chat.

Student's Tasks Description

The student should develop an Entity Detection API that can detect patient names before they are posted on a forum or sent via chat. Even though the chat has end-to-end security, hospitals might also choose to work with a shift phone, which is used by multiple people during the same shift. Having an entity detection system in place is an extra measure to prevent patient name leaks.

In the first stage, the student is supposed to get familiar with the MDOP app and research Name Entity Recognition. This process should be documented and analyzed how it can be integrated with the MDOP app. At later stages, student should be able to develop an Entity Detection API.

Technical Prerequisites

Programming skills and an overall understanding of Deep Learning are very important since the student is supposed to build an Entity Detection API or a Deep Learning-based Named Entity Recognition solution for detecting patient names. The student should also document the process and test the integrity of the code. Preferred programming language is python but is not mandatory. The

Please send the completed proposal to ardit.ramadani@tum.de, lennart.bastian@tum.de and tianyu.song@tum.de. Please note that this proposal will be evaluated by the BMC coordinators and will be assigned to a student only in case of acceptance.



student can choose their proffered programming language.

Time management skills and the ability to be self-driven are also very important since the student should decide how to organize and manage their work and time.

References

<https://pubmed.ncbi.nlm.nih.gov/12463926/>