Leveraging LLMs to Enhance Clinical Record Analysis and Retrieval

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Abstract

We describe the current status of a project which aims to explore the potential of large language models (LLMs) in enhancing the analysis and retrieval of clinical records. The pilot application will enable a more efficient interaction of clinical practitioners with the documents related to the medical history of a patient. Instead of painstakingly consulting dozens of documents in order to gather the information necessary to properly treat the patient, the application will enable a Question/Answer interaction paradigm. A doctor will be able to ask for precise information through a dialogue interface, and drill down to what he/she needs.

The project is structured as a collaboration between the Natural Language Processing (NLP) group of the Dalle Molle Institute of Artificial Intelligence (IDSIA USI SUPSI) and the "Information and Communications Technology area" of the Ente Ospedaliero Cantonale (EOC ICT). A very preliminary exploration of the possibility to use an in premise LLM has been conducted in 2023 at EOC with external consulting from IDSIA.

The first goal consists of efficiently identifying and categorizing pertinent medical concepts, diagnoses, procedures, and medications mentioned in free text narratives within clinical records.

The second goal consists of developing tools that can analyze unstructured clinical data to generate insights and summaries for clinicians, potentially aiding in diagnosis, treatment planning, and personalized medicine approaches.

A third goal is the semi automated generation of discharge letters. Initial results concerning the semi automated generation of discharge letters with LLMS, starting from de identified versions of the patient's documentation, have already been obtained, and will be presented at the conference.