**Abstract**

Artificial intelligence (AI) is making significant strides in healthcare, changing how medical professionals interact with patients and manage medical records. This thesis focuses on developing an AI-based system for summarizing patients' medical histories, using data from their Electronic Health Records (EHRs)—the digital form of medical records. The system, called "Patient Medical History Generation using AI (PMHG-AI)," integrates natural language processing and machine learning to create concise, accurate summaries of patient histories. By automating this process, healthcare professionals will have more time to focus on patient care, diagnosis, and treatment, instead of being bogged down by documentation. The system will also be capable of storing patient histories automatically, further streamlining the clinical workflow and enhancing communication between healthcare providers and patients. Additionally, PMHG-AI goes beyond just summarizing existing records—it can create new patient histories by asking targeted questions, saving time for healthcare professionals and improving the quality of patient care by ensuring that critical information is accurately captured.

**Introduction**

In recent years, AI has been transforming healthcare, from improving diagnostics and treatment plans to patient monitoring. AI-powered tools, such as chatbots for personalized medical advice or advanced imaging for disease detection, are becoming commonplace. The inspiration for this research comes from the challenges involved in creating and maintaining manual EHRs, which are time-consuming and prone to errors. This research aims to develop an AI-powered system that accurately summarizes patient medical histories, helping healthcare providers save time and improve the accuracy of patient information. By utilizing natural language processing (NLP) and machine learning (ML), the system will not only summarize existing records but also create new ones when needed, helping healthcare professionals focus on what matters most—patient care.

The project seeks to make EHR creation more efficient, allowing doctors to focus on complex tasks. EHRs contain a patient's detailed medical history, which healthcare workers use to make informed decisions about patient care. This research will use a combination of custom datasets from hospitals and publicly available ones to train and test the AI models, with the goal of reducing errors and improving patient-centered care. The current EHR system is mostly manual, and physicians often spend valuable time creating, reviewing, and updating records. This project aims to change that by introducing an intelligent system that can summarize medical histories, provide recommendations, and reduce the risk of human error.

**Literature Review**

AI has significantly improved the way EHRs are managed, enhancing both accuracy and efficiency in clinical settings. One study showed how combining AI with retrieval-augmented techniques could help extract and summarize key clinical data, greatly improving the time healthcare providers spend on documentation. Another study focused on generative AI for creating patient-centered clinical notes, ensuring that records are aligned with clinical realities and patient needs.

AI-driven clinical decision support systems have also been developed, providing personalized recommendations based on unique patient data. AI can even help generate discharge summaries, further reducing the documentation burden on physicians. One innovative framework demonstrated how AI could handle and analyze complex data within health records by using large language models.

However, despite these advancements, there are still gaps in using AI to generate complete patient histories in real-time, particularly in patient-centered, interactive formats. Current systems mainly focus on automating documentation, but there’s a need for solutions that actively engage with patients and dynamically create their medical histories.

**Research Gap and Research Question**

While generative AI has been used to create clinical documentation and summarize EHRs, most of the research has been focused on systems designed for hospitals abroad. These systems are not always adaptable to the needs of our country, where medical records may differ significantly. There is a clear need for a system that can analyze medical records based on local data and engage with patients to create their histories in real-time. This project seeks to fill that gap by developing a system tailored to our healthcare environment, capable of dynamically generating EHRs through patient interaction.