

SafeBytes

Introduction

Foodborne diseases remain a significant public health concern globally, often resulting in substantial morbidity and economic burden. Early detection and response are critical in mitigating the impact of outbreaks. With the vast amounts of data generated in healthcare settings, EHRs present an invaluable resource for monitoring health trends. This project aims to harness AI to analyze EHR data, predict potential foodborne disease outbreaks, and present the findings in an accessible format to users.

Methods

AI & Data Analysis

We integrated OpenAI's AI models to analyze trends within EHR data. The AI models utilize machine learning algorithms to process and interpret large datasets, identifying patterns and anomalies that may indicate emerging foodborne disease risks. Natural language processing (NLP) techniques are employed to extract relevant information from unstructured data fields within the EHRs, such as patient symptoms and diagnoses.

Data Integration

EHRs serve as the primary data source, providing up-to-date and accurate health information. The data includes anonymized patient records encompassing demographics, reported symptoms, diagnostic codes, and geographical information. Data integration involves aggregating EHR data from multiple healthcare facilities while ensuring compliance with privacy regulations like HIPAA. Data pre-processing steps are implemented to clean and standardize the data for analysis.

Web Development

The platform is developed using Next.js, a React framework that facilitates server-side rendering and building static web applications. Next.js is chosen for its ability to create a responsive and fast user interface, enhancing user experience. The front-end displays real-time insights on disease trends and potential outbreaks through interactive maps. Visualization libraries are incorporated to represent data effectively, allowing users to interact with maps displaying affected areas, common symptoms, and associated local restaurants.

Results

The AI workers using their step functionality successfully identified patterns correlating with foodborne disease outbreaks by analyzing symptom clusters and geographical distribution from the EHR data. The platform provides users with visual maps highlighting hotspot areas, common symptoms reported, and potential links to local dining establishments. Users can interact with the maps to obtain detailed information about specific areas and receive alerts about potential outbreaks.

Conclusion

The integration of AI with EHR data presents a powerful tool for predicting foodborne disease trends. The developed platform demonstrates the feasibility of real-time monitoring and prediction of outbreaks, providing valuable insights to both the public and health authorities. By offering an accessible interface with interactive maps and timely information, the platform has the potential to enhance public health responses and reduce the impact of foodborne diseases.