

ICD Code Generation- A Case Study

ICD codes are crucial in medical applications for standardizing the classification of diseases and health conditions. They facilitate accurate data collection, analysis, and reporting across various healthcare settings, including hospitals, insurance providers, and research institutions. This standardized system allows for the consistent tracking of health trends, supports payment systems, informs policy decisions, and enables effective communication among healthcare professionals worldwide.

Aashaya is developing AI/ML models for ICD code generation leverages large language models (LLMs) to automatically assign diagnosis codes from unstructured clinical intake documents with MIMIC database. By processing physician notes, patient history, and symptom descriptions, the model identifies relevant medical terms and maps them to standardized ICD-10 codes with high accuracy. This approach reduces manual coding effort, minimizes errors, and accelerates billing and documentation processes.

We have fine-tuned state-of-the-art large language models (LLMs), including LLaMA 3.3 70B, LLaMA 3.1 8B, and Mistral Small 22B, on medical notes and discharge summaries from the publicly available MIMIC-III and MIMIC-IV datasets. Leveraging high-performance hardware, including multiple NVIDIA H100 80GB and H200 GPUs, we optimized the training process for efficiency and scalability. The resulting models demonstrate strong performance in automating ICD-10 code prediction with **excellent accuracy of up to 90%** from discharge summaries, offering significant potential for improving clinical documentation and decision support systems.

Trained on large clinical datasets, the model continuously improves its performance and adapts to evolving coding standards. This solution streamlines healthcare workflows, enhances compliance, and supports efficient, data-driven medical record keeping and reimbursement practices.

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