Distilling Impactful Health Insights from Big Data

Future Health Expo

Thursday March 14th 2024

Table of Contents

1.

2. OMOP-EMR: Facilitating research by standardising electronic medical record data from multiple sites

Key points

The Observational Medical Outcomes Partnership Common Data Model (OMOP-CDM) standardises the structures and semantics of health datasets, enabling reproducibility and large-scale studies that leverage the data from multiple locations and settings.

We have built an Extract-Transform-Load (ETL) framework for the conversion of health databases to the OMOP CDM that supports transparency of the mapping process, readability, and maintainability.

We have used this framework to build a software tool that transforms Cerner Millennium (Cerner Corporation)) electronic health records used by Australian Local Health Districts to OMOP-CDM.

This allows for the creation of shared end-to-end analysis packages using hospital electronic medical record data without the need for direct data exchange.

Key links

Extract, transform, load framework for the conversion of health databases to OMOP. *PLOS ONE* (2022)
https://doi.org/10.1371/journal.pone.0266911

Seamless EMR data access: Integrated governance, digital health and the OMOP-CDM. *BMJ Health and*

4. Automating ICD coding from clinical text

Key points

A hierarchical label-wise attention transformer (HiLAT) model was proposed for automating ICD coding process and employed a two-level hierarchical label-wise attention mechanism that creates label-specific document representations.
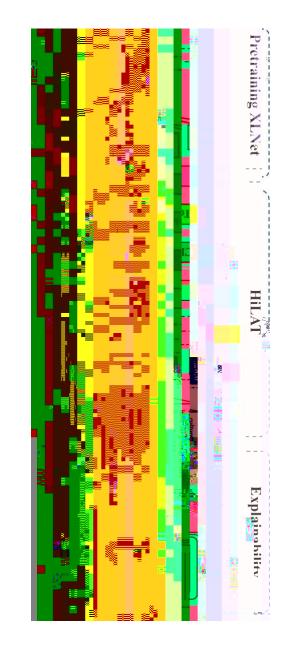
HiLAT achieved state-of-the-art performance on the top 50 most frequent ICD-9 codes from MIMIC-III and presents a potential explainability tool for checking the face validity of ICD code predictions by visualising label-wise attention weights.

Several Transformer-based models were explored to address the extreme label set and long text classification challenges that are posed by automated ICD coding tasks.

Key links

Hierarchical label-wise attention transformer model for explainable ICD coding. *Journal of Biomedical Informatics* (2022)
doi.org/10.1016/j.jbi.2022.104161

Automated ICD coding using extreme multi-label long text transformer-based models. *Artificial Intelligence in Medicine* (2023)
doi.org/10.1016/j.artmed.2023.102662

6. Evidence about the use, safety, effectiveness, and costs of new medical devices and technologies

Key points

CBDRH and Medtronic Australasia established a partnership to leverage real-world evidence.

We aimed to overcome data source limitations to improve coverage of Australian patients and ensure long-term follow-up.

Employed longitudinal NSW administrative data from 2001 for patients with cardiovascular diagnoses.

The projects undertaken were:

1. "Cost of Cardiac Implantable Electronic Device (CIED) Infections: a Non-interventional Study using Linked Secondary Data."

2. "Trends and Patterns in Transcatheter Aortic Valve Implantation (TAVI) Access and Utilization in New South Wales: a Data Linkage Study."

Key links

Real-world evidence on the association between cardiac implantable electronic device infection and all-cause mortality. *EP Europace* (2023)

7. YourIVFSuccess

8. Educating the next generation of Health Data Scientists

Key points

Our master's degree, graduate diploma and graduate certificate in health data science are pioneering programs that examine data-driven solutions to complex health problems.

We also offer continuous professional development in areas such data management, statistical modelling, machine learning and data visualisation.
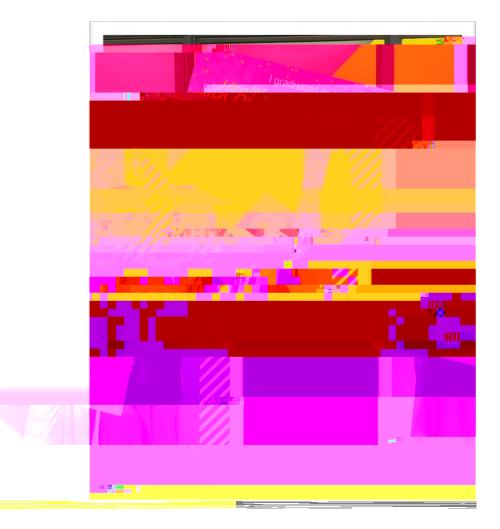
We supervise post-graduate PhD and research master's students.

Key links

UNSW website
https://www.unsw.edu.au/medicine-health/study-with-us/study-areas/health-data-science

Health Data Science Student Hub
https://hds-hub.cbdrh.med.unsw.edu.au/

Over 100 students have already graduated from our Masters of Science on Health Data Science Program