

# Automating text processing in General Practice: Opportunities and challenges for natural language processing and user experience design



David Fraile Navarro<sup>1</sup>, A. Baki Kocaballi<sup>2</sup>,  
Mark Dras<sup>3</sup>, Shlomo Berkovsky<sup>1</sup>

<sup>1</sup> Australian Institute of Health Innovation, Macquarie University

<sup>2</sup> School of Computer Science, University of Technology Sydney,

<sup>3</sup> Department of Computing, Macquarie University

**Motivation:** GPs are the curators of EHRs. Lots of time spent typing, pasting info, writing/reading referrals, etc..

**Aim:** Understand views and attitudes of GPs towards an NLP assisted EHR record system.

**Methods:** Thematic analysis of 10 semi-structured interviews with GPs

**Results:** Main theme was *Doctor-AI collaboration*. This addresses the reciprocal clinicians-technology relations that do not threaten to substitute clinicians, but to establish a dialog with them.

# Main Themes and Subthemes

Desired Features

Doctor-AI collaboration

Progressive automation

Explainable / transparent AI

Keeping control of the record

Trusting AI

Information and relation extraction

Summarization

Speech-recognition

Searchable records

Automated consultation summaries for patients

Medicolegal-issues

Privacy and safety

Automation bias

Filtering & aggregation

Implementation

Clinician's resistance to change

Beyond the screen and keyboard

AI as a Digital assistant

AI as Expert system

Consultation of the future

# Forthcoming study: wireframing and user surveys

EHR Software

Free-text note, discharge letter, referral ...

Ribavirin UMLS: C0035525 was also evaluated against SARS-CoV-2 infection , but the antiviral UMLS: C0003451  
MEDICATION\_NAME DIAGNOSIS MEDICATION\_CLASS

property of drugs UMLS: C0013227 is still not well established against the SARS-CoV-2 UMLS: C5203670 negation  
TREATMENT\_NAME DIAGNOSIS

In addition, after oral administration, the drug was rapidly absorbed into the GI tract UMLS: C0017189 .  
ROUTE\_OR\_MODE BODY\_STRUCTURE

The drug has oral bioavailability around 64 % with large volume of distribution.  
ROUTE\_OR\_MODE EXAMINATION\_VALUE EXAMINATION\_UNIT



Highlight



Extract & Review



Automated Extract

Coded clinical "entities" – EHR

# Questions for the audience



- What elements of interaction to focus on in the forthcoming study?
- How to measure quantify the success/performance of these elements?
- Are there any other modalities of interaction to consider?
- Any other suggestion or idea?

