

Decision Support System

Using natural language processing to help psychiatrists assess patients

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Overview

Psychiatrists working for a national healthcare system have been provided access to an AI system that can support decisions made during initial patient assessment and diagnosis.

The system uses a modern form of natural language processing that is reliant on neural networks to identify salient features of a patient's speech. This includes the words and phrases the patient states as well as extra-linguistic properties, such as intonation or pace.

The system operates in real-time to make recommendations to the psychiatrist. The recommendations can include suggestions about specific topics that were raised by the patient, which may require follow-up (e.g. reference to problematic relationships), as well as generic features that may be informative. Many recommendations require additional interpretation from the psychiatrist, and no automated decisions are made by the system.

The system's outputs can be shared with the patient where explanations are required. As such, the system has been designed to support patient-psychiatrist communication and participatory decision-making. For instance, phrases that were flagged as relevant are emphasised and specific recommendations are also accompanied by confidence ratings that can be explained by a trained psychiatrist.

Key Consideration



The system has been designed for use as a *decision support system*.

Are there properties of the system that could negatively impact the ability for the psychiatrist to perform their clinical duties effectively?

Deliberative prompts

1

If the system was designed from scratch, how should psychiatrists and patients be involved in its design, development, and deployment?

2

Why does it matter that the system functions as a decision support tool and not an automated decision-making system?

3

Should patients have full access to the outputs of the decision support system?

Datasheet

Category	Details
Available Data	<ul style="list-style-type: none">• Automated transcription of the conversations between patient and psychiatrist• Extracted extra-linguistic features from audio recording of the conversation• Relevance feedback from the psychiatrist about salience of specific recommendations• Electronic health record of patient, including any initial assessment data (e.g. PHQ-9) or prescriptions.
Analysis Techniques	<ul style="list-style-type: none">• Natural language processing (NLP):<ul style="list-style-type: none">• System uses convolutional neural networks for speech recognition and to identify features from audio recording, which are then classified according to whether they are informative (i.e. exceeding some relevance threshold)• Visualisation techniques support explainability by highlighting salient features

Available Data

Analysis Techniques



Groups, Organisations and Affected Individuals

1 Patients

2 Psychiatrists