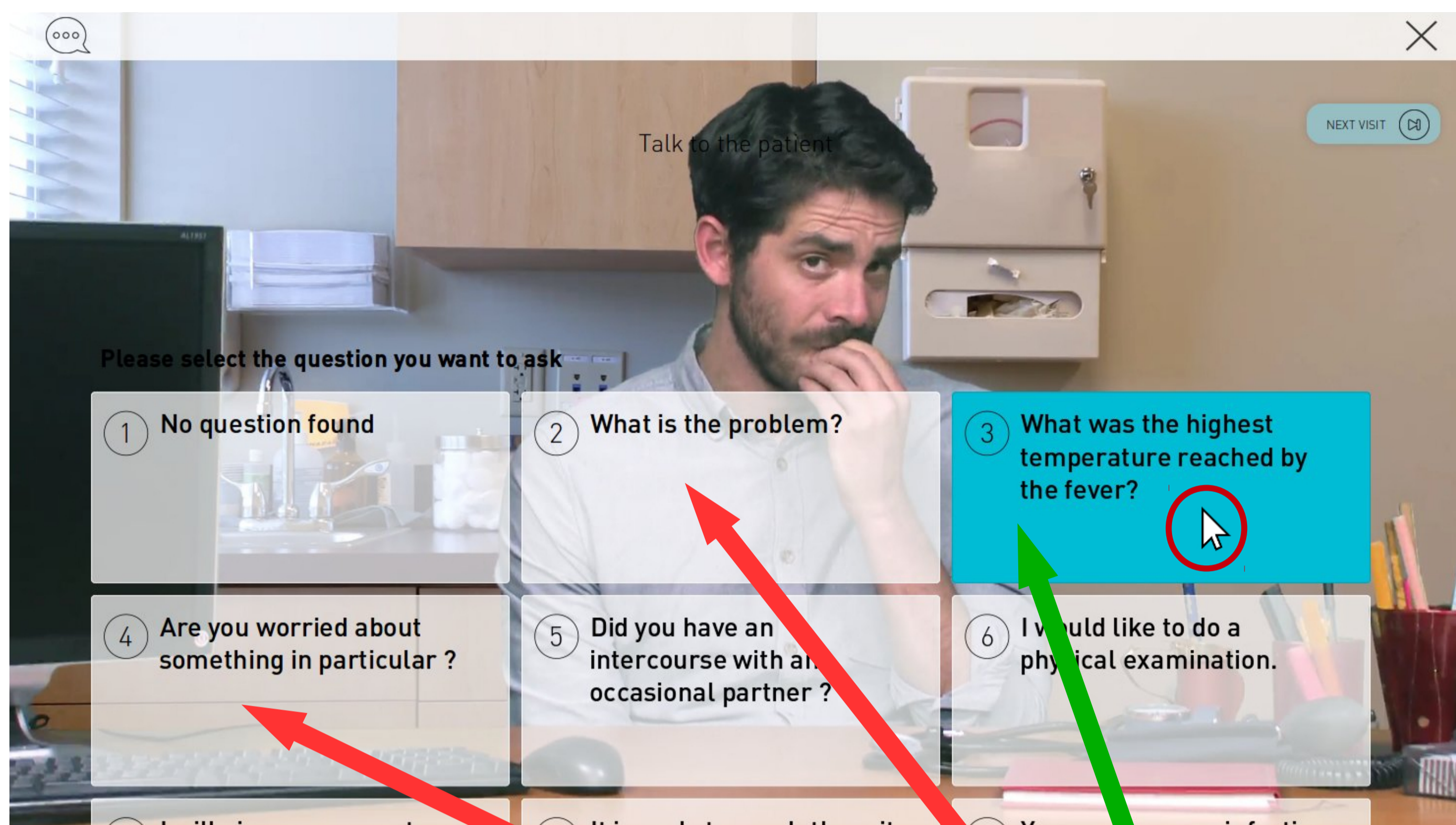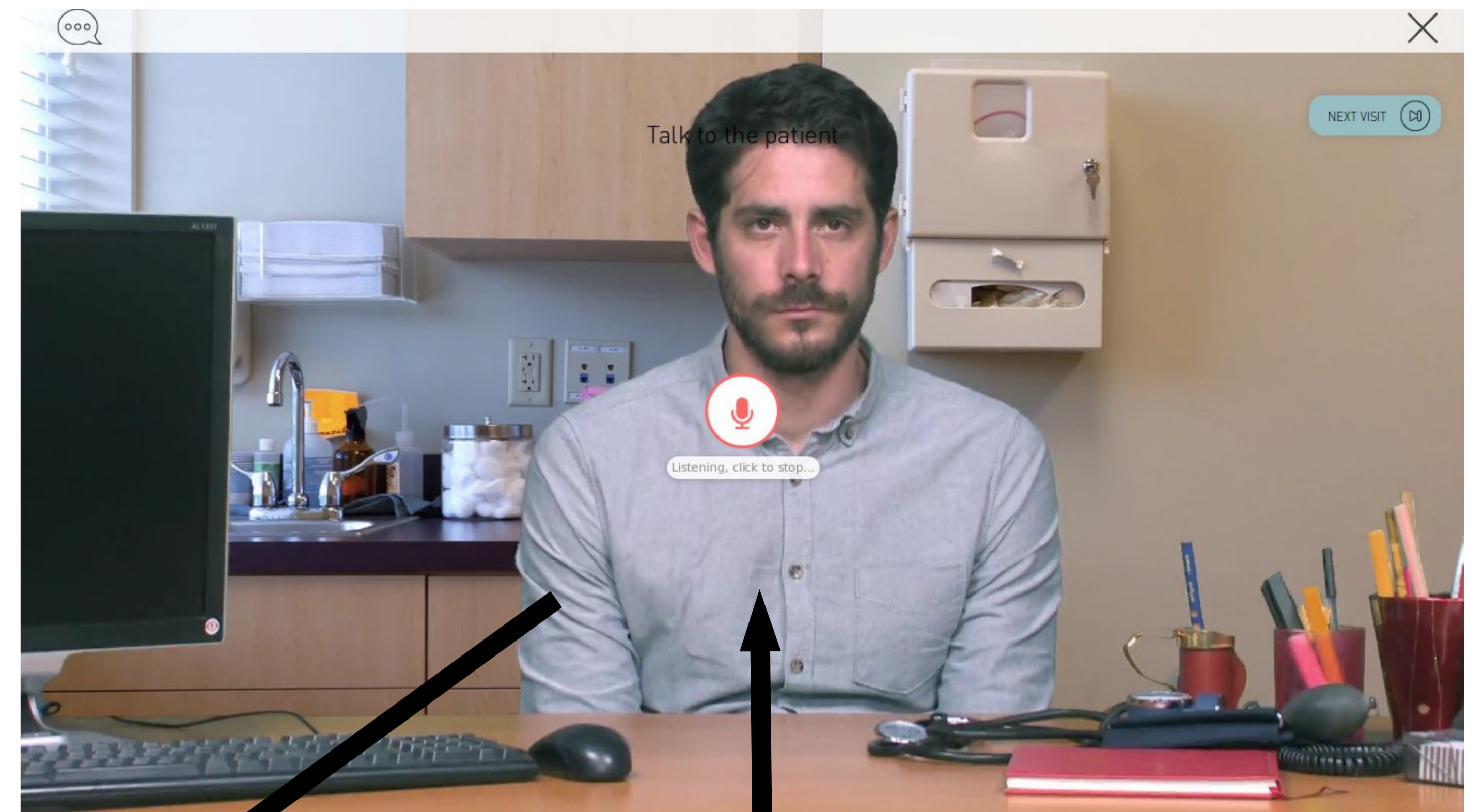# Weighted word overlap and word embeddings: A practical ensemble approach to Question Matching in a Dialogue Simulator

Don Tuggener, Manfred Klenner (University of Zurich)

Riccardo Mazza, Salvatore Vanini, Nicola Rizzo, Nadia Catenazzi (SUPSI)
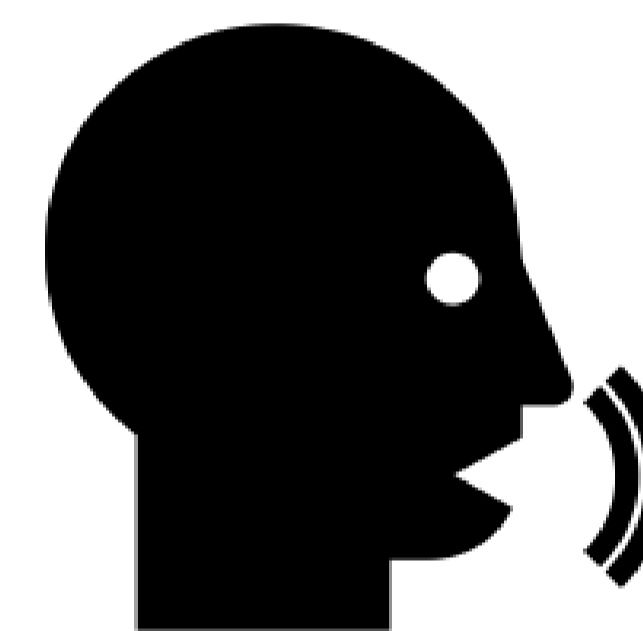
Giulio Tavarnesi, Stefano Fumagalli (*LifeLike*)

Old system: Mouse interaction

New System: Voice interaction

Overview

- **Dialogue simulator** for medical interviews (LifeLike)
- Replace mouse interaction with **voice input**
- **Match** user input to available **questions** using machine learning
- Handle non-matching inputs, speech-to-text errors

Approach

- **Speech-to-text** API (Google)
- **SVM classifier** ranks every possible answer
- **Features**: TF IDF word weights, semantic similarity (embeddings)
- **Postfilter** to identify inputs without a match, foul language, jokes

Data

- Gathered in **experiments** with **medical students** in a text-based version of the system
- Captured for every input whether there is a matching answer and which one it is (indicated by the student)
- ~1000 annotated input – answer pairs

Evaluation

- Ten-fold cross-validation
- **~87% accuracy** in identifying the correct answer
- For ~97% of the matching inputs the correct match is among the top three ranked answers