# AI-Driven Retrieval and Analysis of Videotaped Council Meeting Archives using Automatic Speech Recognition, Speaker Identification, and Retrieval Augmented Generation

June 23, 2024

**Student:**
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**Lecturer:**
Dr. Maarten Marx

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# Searching through meetings

*What are the expected advantages to the installation of the gardens surrounding underground trash containers?*

# Demo

localhost
online

# Research question

*How can AI be utilized in order to increase information retrievability of large video archives, in particular of democratically elected councils?*

# How we solved the problem

- Automatic archiving tool
- Automatic analysis of meetings
  - Speech to text
  - Speaker segmentation
- Transcript search engine
- Conversation-style chat bot
- Easy navigable web application

# Architecture

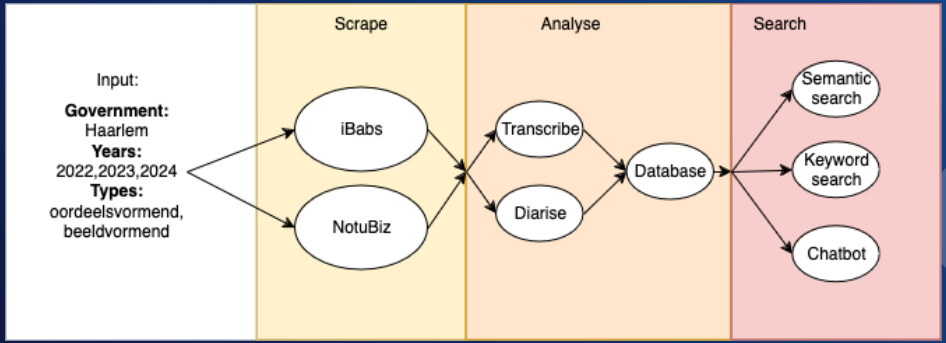


Figure: Schematic architecture of the developed scrape-, analysis- and search pipeline

# Analysis

- Speech to text
  - OpenAI's Whisper
- Speaker recognition
  - pyannote.audio
- Manual speaker naming
- Database

# Analysis pipeline

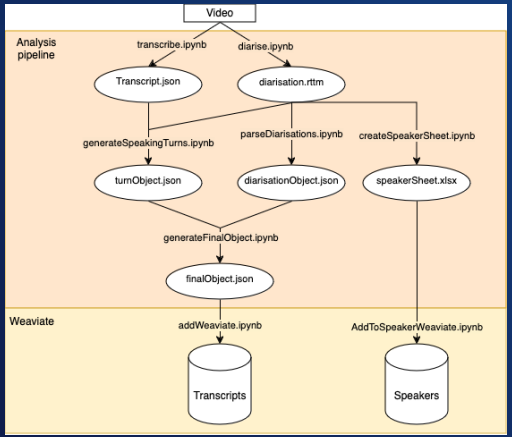


Figure: Schematic architecture of the developed analysis pipeline

# Architecture

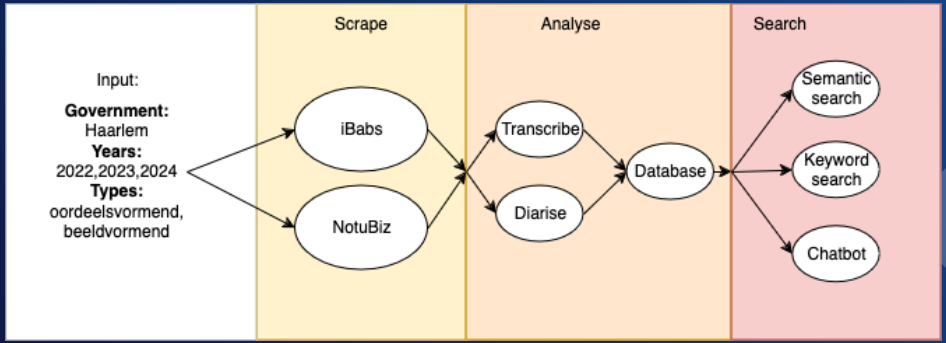


Figure: Schematic architecture of the developed analysis- and search system

# Does our solution work?

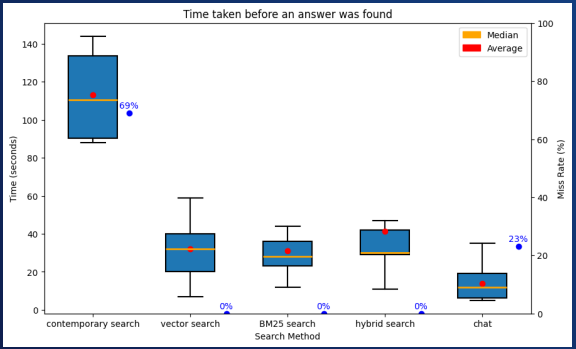


Figure: Average search time for different search methods used by 13 participants. Participants were given three minutes to find the answer to one of five questions.

# Research question

*How can AI be utilized in order to increase information retrievability of large video archives, in particular of democratically elected councils?*

# Conclusion

- Improve retrievability of specific information in multi-hour long video meetings
  - Automatic iBabs & NotuBiz scrape tools
  - Speaker diarisation & automatic speech recognition
  - Semantic- and keyword search engine
  - Chat bot
  - Online search application