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AI MEETING SUMMARIZER

"Automating Meeting Transcription, Diarization, and Summarization"

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Motivation

- Modern meetings generate *hours of audio*, hard to review manually.
- Need for *automated summarization* to improve productivity.

Challenges:

- Long recordings
- Multiple speakers
- Background noise
- Extracting key insights efficiently

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Project Overview

1. Cleans audio
2. Transcribes speech
3. Identifies speakers
4. Merges results
5. Generates AI summaries
6. Supports real-time or uploaded audio
7. Provides both CLI and Streamlit dashboard

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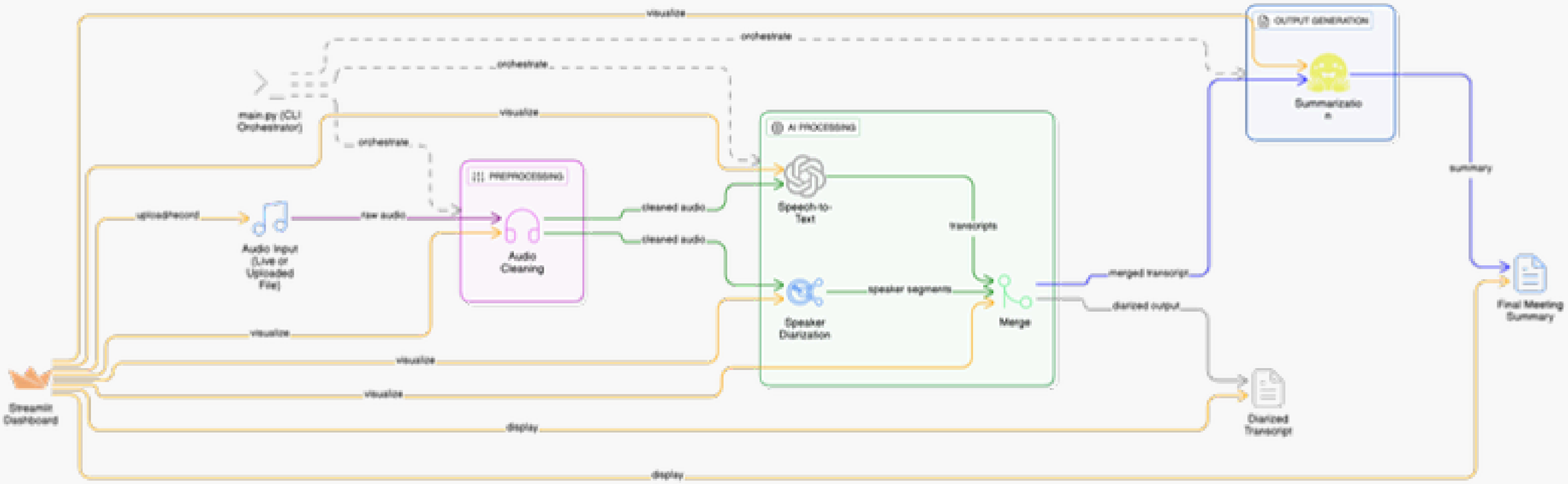
System Architecture



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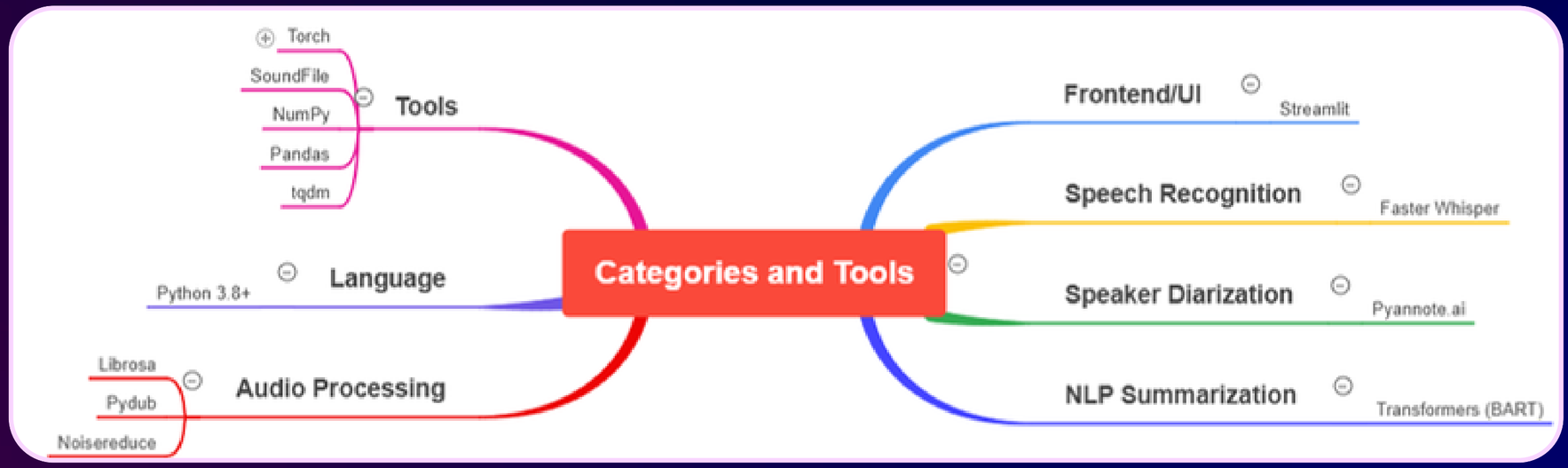
Tech Stack



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Pipeline Stages (Detailed Flow)

STEP	DESCRIPTION	SCRIPT/MODULE
1. Audio Cleaning	Noise reduction, resampling	milestone_1/audio_cleaner.py
2. Transcription	Faster Whisper model	milestone_2/usingfilemodel.py
3. Diarization	Speaker detection via Pyannote	milestone_4/dairization.py
4. Merging	Align speech & speakers	milestone_4/merge.py
5. Summarization	Transformer (BART)	milestone_4/summarizer.py

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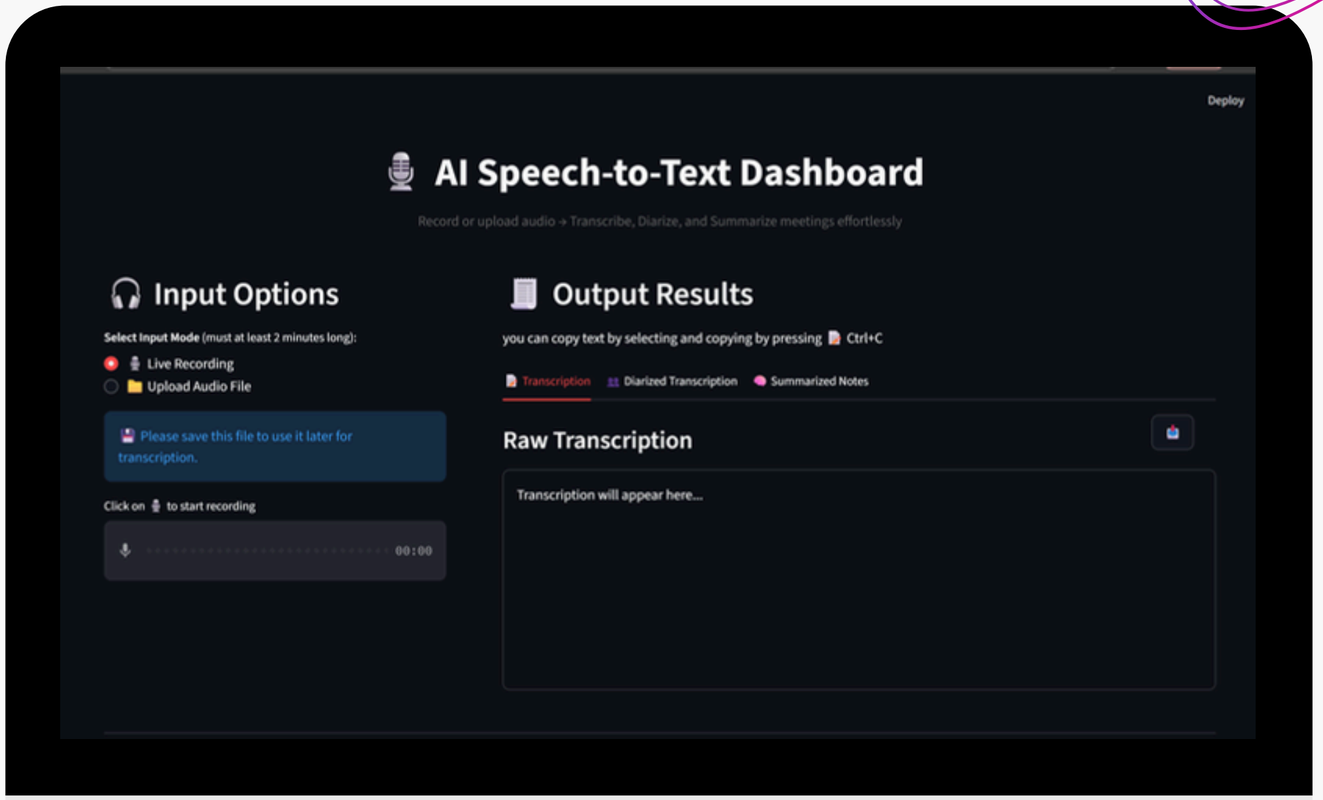
User Interface (Dashboard)

- Built with Streamlit
- Allows:
  - Uploading or recording audio
  - Running full pipeline
  - Viewing transcript, diarization, and summary



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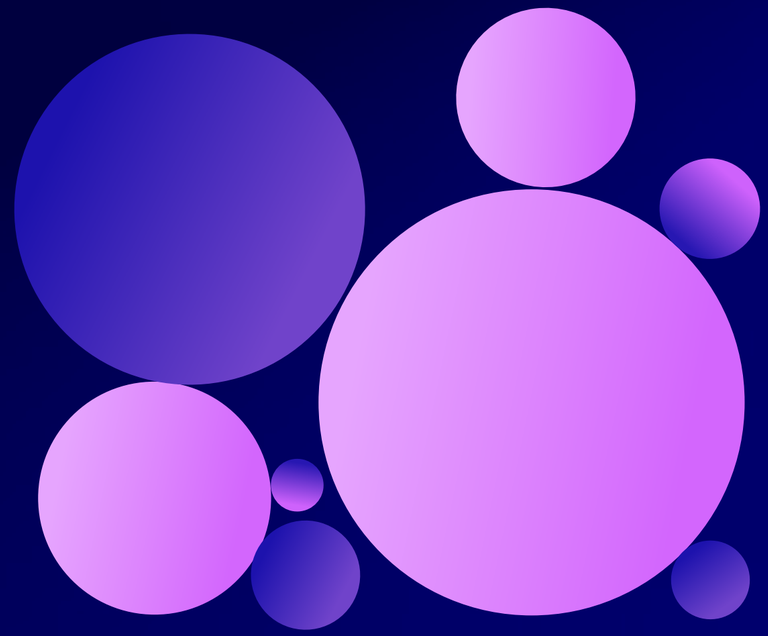
Core AI Models

1. Whisper (Speech-to-Text)
   - Model: faster-whisper/small.en
   - Converts speech → text with timestamps
2. Pyannote.ai (Diarization)
   - Identifies who spoke when
   - Cloud-based API
3. BART (Summarization)
   - Model: facebook/bart-large-cnn
   - Converts long transcripts into concise summaries



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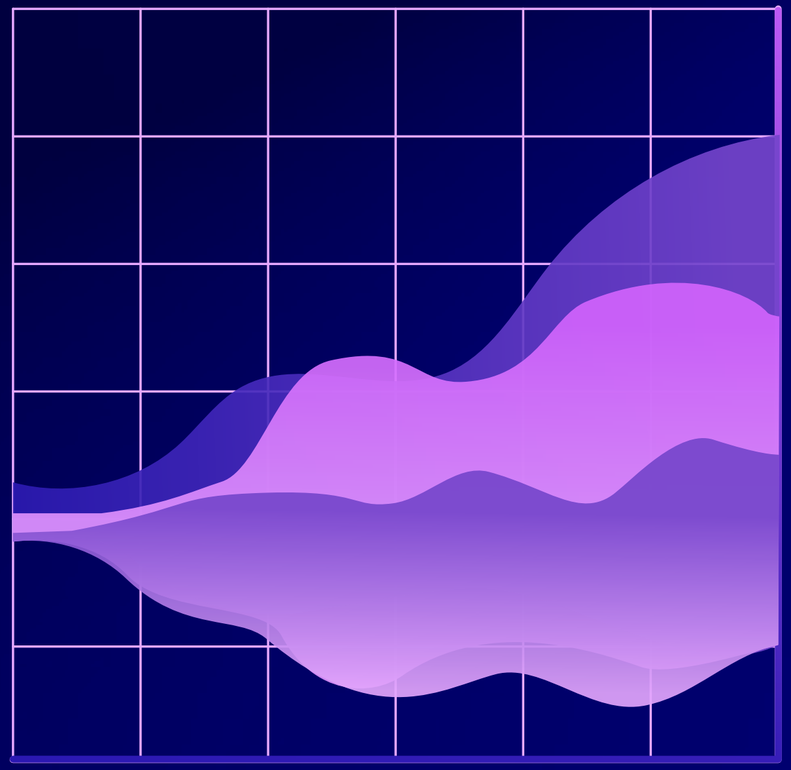
Evaluation & Testing

- **WER (Word Error Rate):** measured using jiwer
- **Quality checks:**
  - Clean waveform (manual)
  - Transcript accuracy
  - Speaker correctness
  - Summary coherence
- **Independent testing of each milestone (modular design)**



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Key Features & Highlights

- Real-time and file-based audio support
- Accurate transcription with Whisper
- Multi-speaker diarization
- Summarization using Transformer models
- Modular design — each milestone testable
- Interactive Streamlit dashboard

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Future Enhancements & Conclusion

- **Future Work::**
  - Live meeting integration (Zoom, MS Teams APIs)
  - Real-time diarization
  - Multi-language support
  - Sentiment and action item detection
- **Conclusion::**
  - “AI Meeting Summarizer reduces hours of meeting analysis to minutes – enabling smarter collaboration and faster decision-making.”

Thank You