MeetingGPT

Collaboration empowers teams through communication

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NLP Solution for Extracting Key Insights from Online Meetings

MIDS Capstone

Introduction of Team

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Manager

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Data Analysis Lead

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Data Engineering &
Software Lead

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At MeetingGPT, we harness the power of advanced NLP to transform the essence of meetings into actionable insights, fostering meaningful connections and efficiency in the modern digital landscape.
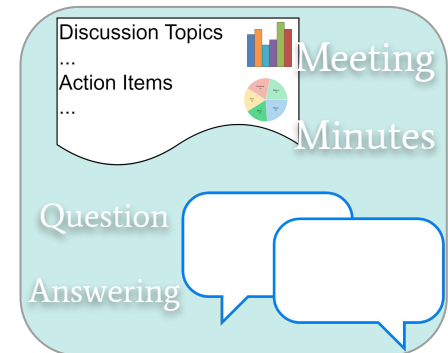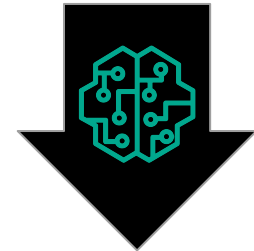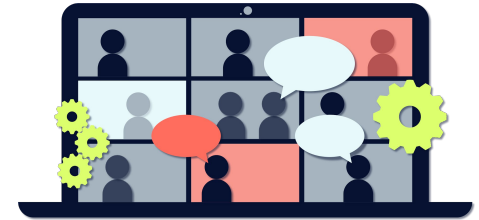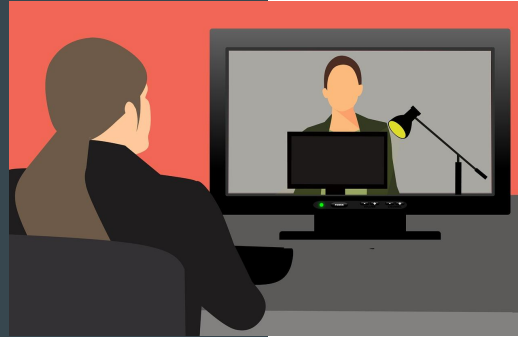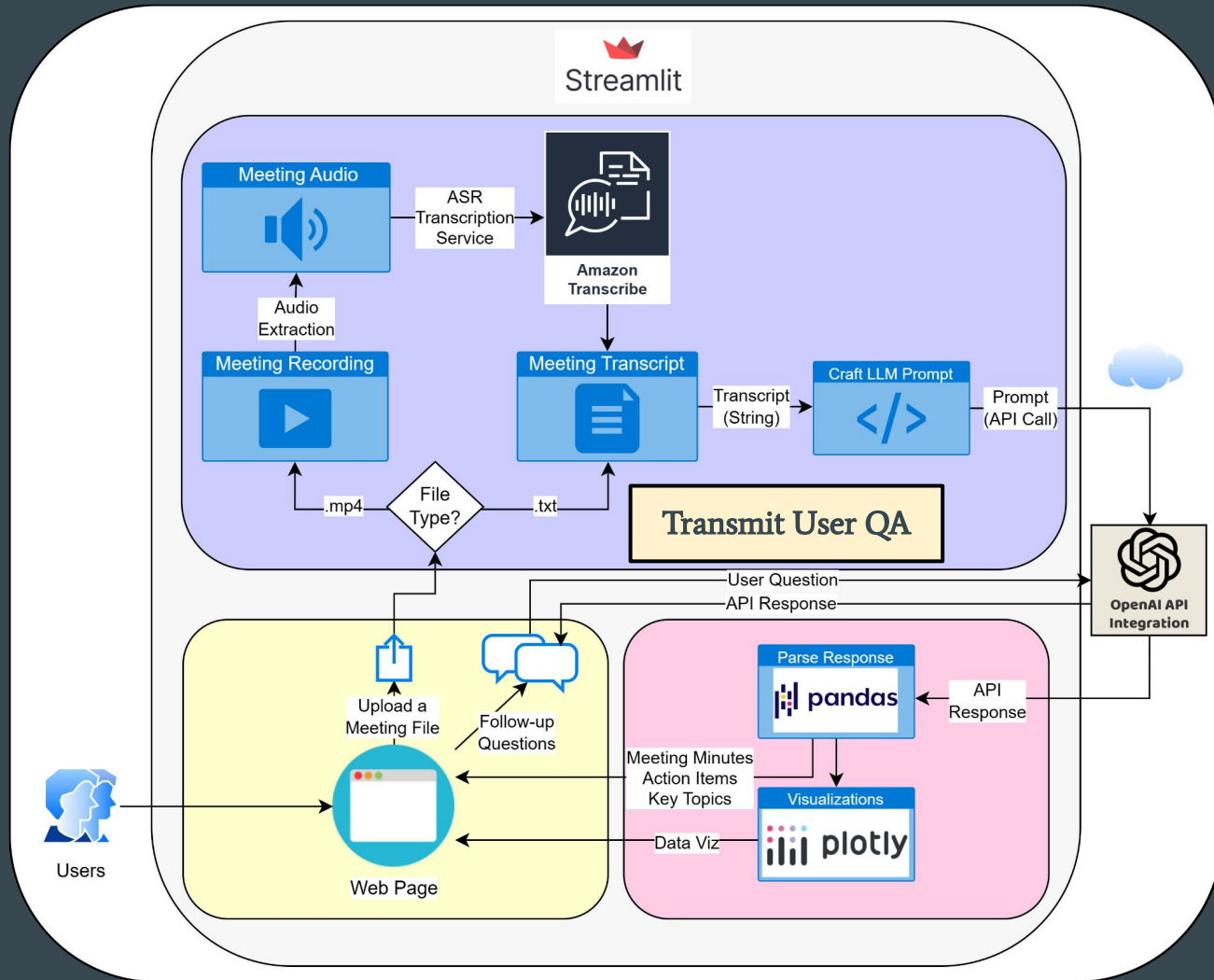
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Demo　　　meetinggpt-final.streamlit.app

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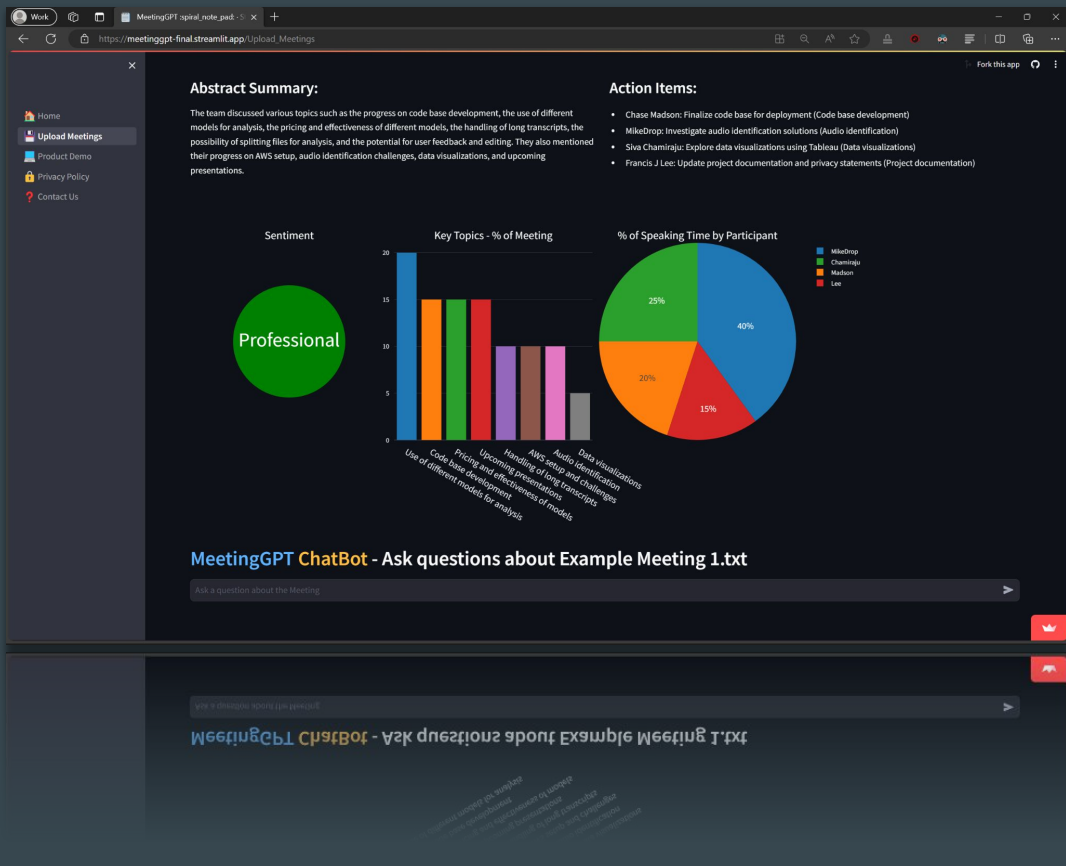
Datasets

Corpus	# of Meetings	Meeting Durations	# of Participants	Domain
AMI	138	10-50 mins	4	Industrial product design
ICSI	61	30-100 mins	4-9	Academic research
ELITR	120	10-50 mins	2-14	Computer science
Capstone Project Meetings	15	45-60 mins	4	Data Science

# of Total Utterances by Meeting - AMI, ICSI, ELITR Corpus

# of Speakers per Meeting - AMI, ICSI, ELITR Corpus
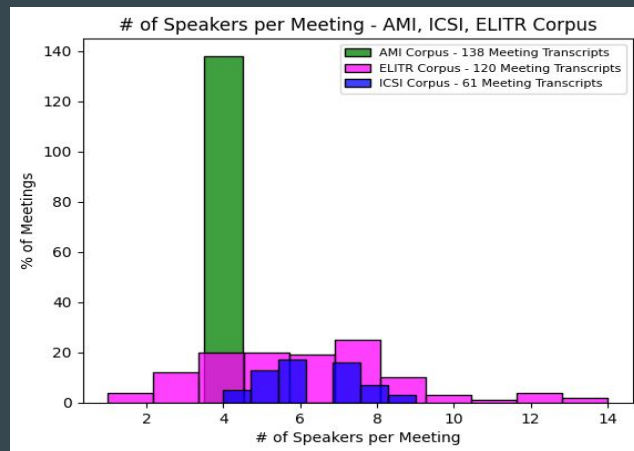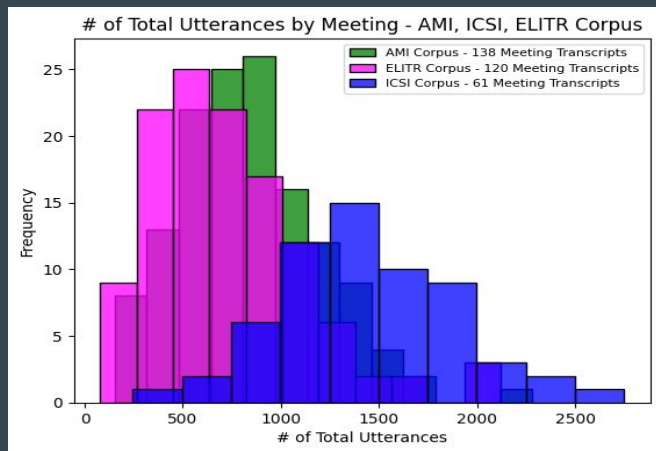
Four Technical Meeting Datasets used for model fine-tuning & evaluation throughout the project
Datasets include wide range of Meeting Duration, # of Participants & Technical topics

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Model Selection → Fine-Tuned Transformers vs. LLMs

			Model Evaluation Results - Meeting Summary Generation for AMI Dataset			
Model Type	Model	Max Input Tokens	Fine-Tuning Dataset - Training	ROUGE (vs. Ref Summ) - AMI Test (89 meetings)		
				ROUGE-1	*ROUGE-2*	*ROUGE-L*
Pre-Trained Transformers (In-House)	Longformer	16384	N/A	0.218	0.026	0.119
	Longformer w/ Fine-Tuning	16384	AMI (50 meetings, 5 epochs)	0.394	0.105	0.202
API-accessed LLMs (External)	**OpenAI - GPT3.5 Turbo**	**16384**	**N/A**	**0.418**	**0.104**	**0.223**
	Meta - CodeLlama	**16384**	**N/A**	**0.419**	**0.109**	**0.231**

Fine-Tuned Transformer falls short in ROUGE and lacks the versatility of LLMs
Proceeding w/ high-performing Base LLMs will enable team to expand tool capability beyond just a summary

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Model Outputs / Prompt Engineering

- The use of LLMs allowed us to expand from a simple meeting summary to five output sections:*
  - Abstract Summary   *Latest Prompt details documented in backup*
  - Key Topics
  - Action Items
  - Sentiment
  - Speaking Time %

- Meeting Datasets used to iterate on optimal prompt & evaluate LLM performance (*GPT3.5 Turbo* & *CodeLlama*) in the following metrics to downselect optimal LLM for our product:
  - Response Time
  - Cost / Meeting
  - % of Meetings requiring Truncation (Exceeds Max Token Length)
  - Qualitative Team Evaluation → % Acceptability of Final Outputs for each sub-section

Final Solution Flow:
Transcript→ Multi-Question LLM Prompt → Reformat LLM Prompt → Post-Processing Functions → Final Dashboard Viz

LLMs solution enabled team to extract insights beyond a summary & add novelty to our product output
Final Solution required two sequential LLM prompts & post-processing functions to ensure consistent output

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Qualitative Team Evaluation - % Acceptable Output

% Acceptable Scoring Ground Rules:

- For each of the meeting, the team scored each subsections w/ a 0, 0.5 or 1 score:
    - **0 → Unacceptable** – Minimal/No output generated
    - **0.5 → Moderately Acceptable** – Output generated, but the content has one primary issue
    - **1 → Fully Acceptable** - Output generated, formatted per intent w/ content that makes sense

% Acceptable Scores Final Viz Output Evaluation (120 Test Set Meetings (AMI/ELITR/ISCI))					
LLM	Summary	Action Items	Topics	Speaking %	Sentiment
GPT3.5 Turbo	**97.9 %**	**80.8 %**	**95.4 %**	**84.2 %**	**99.2 %**
CodeLlama	97.1 %	75.0 %	87.9 %	55.8 %	98.3 %

Test set outputs scored to collect quantitative data to determine relative model performance
GPT3.5 Turbo is best in every sub-section, especially % speaking time, topics & Action Items

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Final Model Evaluation - Quantitative Metrics

Quantitative Evaluation Metrics - GPT3.5 vs. CodeLlama (120 Meeting Test Set)						
	Avg Response Time (sec)		Avg Cost / Meeting ($)		% of Meetings Truncated	
	Week 10	Week 14	Week 10	Week 14	Week 10	Week 14
GPT3.5 Turbo	50	**13**	0.15	**0.04**	18	**28**
CodeLlama	60	**31**	0.06	**0.02**	30	**48**

- *Cost & Response time of models driven down by consolidating into one multi-question prompt*
- *With more lengthy prompt this drove the input tokens up impacting % of meeting truncated*
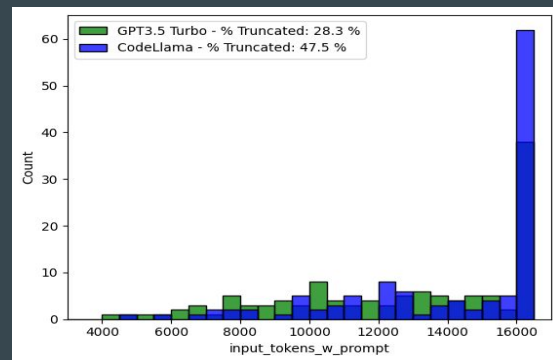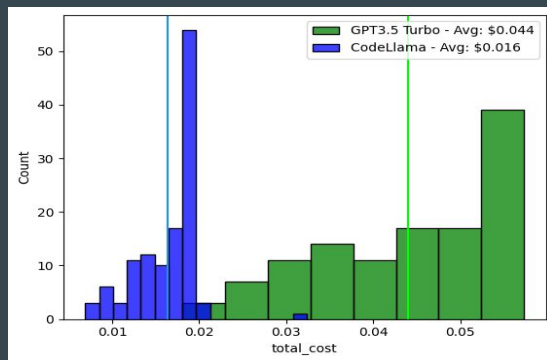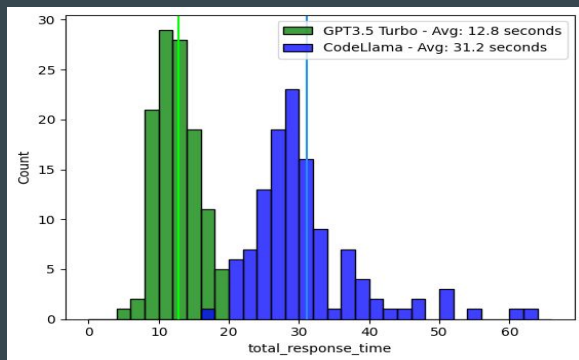
GPT3.5 Turbo superior to CodeLlama in every metric aside from cost ($0.04 vs. $0.02/meeting)
However, with it's faster response time & more reliable output it was selected for our product

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Tie Back

- Corporate Professionals
  - Efficient Review of Key Points
  - Actionable Insights and Follow-ups
  - Time Management
  - Improved Communications
- Education Instructors & Students
  - Engagement Analytics
  - Meeting Recap for Learning
  - Collaborative Learning:
- General Users
  - Q&A Features
  - Visual Analytics
  - Summarize general audio/transcripts

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Top 2-3 Roadmap items if more time

- **Cost**
  - Reduce API costs further (near $0)
- **UI/UX beautification**
  - Customizable dashboards
  - Tableau
- **Business Enterprise functions**
  - login/password, archive meetings, group access
- **Multi Language Support**
  - Any language to English; Any language to any language
- **Human Feedback Loop**
  - Option to loop back based on user feedback
- **Time based Q&A**
- **Continue User Based Survey**

Section 1 of 5

MeetingGPT Feedback Survey

Thank you for participating in this survey!

This survey should take about 5 - 15 minutes to complete.

We're a passionate team from UC Berkeley's graduate Data Science program.

While balancing meetings in school, corporate, and business, we identified a significant gap in the way meetings are reviewed and analyzed.

That's why we created MeetingGPT.

It's not just another tool, but a AI-driven solution for meeting insights, summaries, and engagement analytics.

Whether you've missed a meeting, need the highlights, or crave deep engagement analytics, MeetingGPT has the answers.

Your feedback on the initial product is crucial in helping us improve the product which we greatly appreciate!

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Conclusion

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MeetingGPT harnesses the power of advanced NLP to transform the essence of meetings into actionable insights, fostering meaningful connections and efficiency in the modern digital landscape. Collaboration empowers teams through communication where no idea is left behind.

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Privacy Notice

- Transparency is key to the Users
- Notice is outlined in 14 sections
- Contact Us
  - Privacy Inquiries
  - General Inquiries
- Adhered to OpenAI's Usage Policies & Meta's Responsible Use Guide

OpenAI

Research ⌄   API ⌄   ChatGPT ⌄   Safety   Company ⌄

Usage policies

Updated
March 23, 2023

We've recently up...

We want everyone...
that apply to all us...
our technology we...

If we discover that...
necessary change...
suspending or ter...

Our policies may...

Disallowed ...
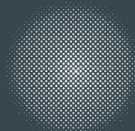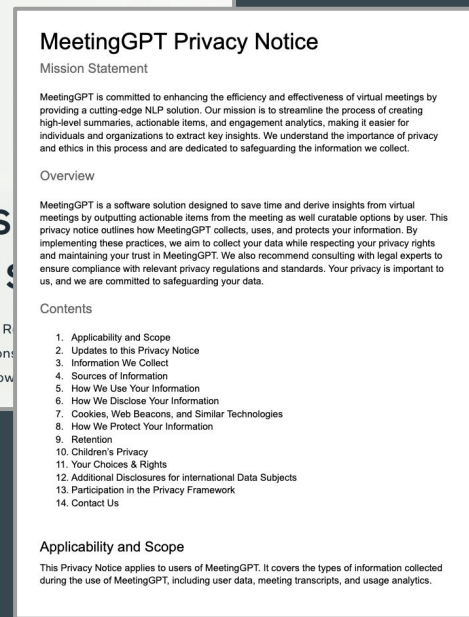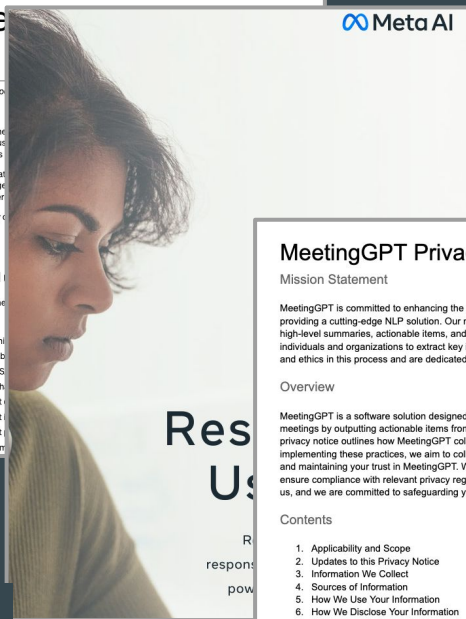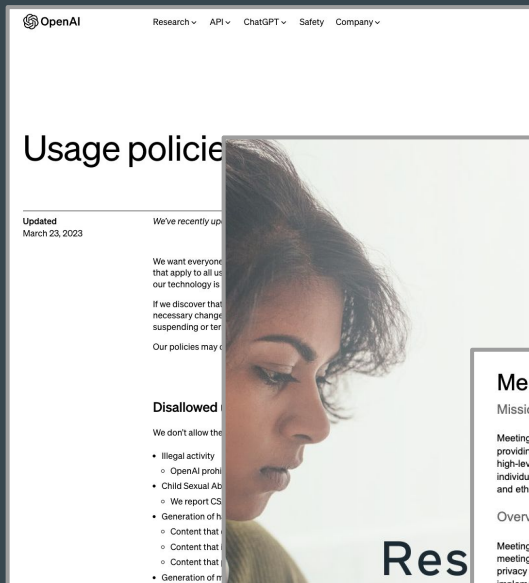We don't allow the...

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- Child Sexual Ab...
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MeetingGPT Privacy Notice

Mission Statement

MeetingGPT is committed to enhancing the efficiency and effectiveness of virtual meetings by providing a cutting-edge NLP solution. Our mission is to streamline the process of creating high-level summaries, actionable items, and engagement analytics, making it easier for individuals and organizations to extract key insights. We understand the importance of privacy and ethics in this process and are dedicated to safeguarding the information we collect.

Overview

MeetingGPT is a software solution designed to save time and derive insights from virtual meetings by outputting actionable items from the meeting as well curatable options by user. This privacy notice outlines how MeetingGPT collects, uses, and protects your information. By implementing these practices, we aim to collect your data while respecting your privacy rights and maintaining your trust in MeetingGPT. We also recommend consulting with legal experts to ensure compliance with relevant privacy regulations and standards. Your privacy is important to us, and we are committed to safeguarding your data.

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Applicability and Scope

This Privacy Notice applies to users of MeetingGPT. It covers the types of information collected during the use of MeetingGPT, including user data, meeting transcripts, and usage analytics.

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Acknowledgement & Resources

University of California - Berkeley for their invaluable support, expertise, and guidance provided by the faculty and fellow students that have been integral to the success of our capstone. OpenAI for the ChatGPT model, which played a significant role in the development of our project by providing advanced natural language processing capabilities. Meta AI for the LLaMA-2 model, which enhanced our project's deep learning capabilities and another LLM for comparison.

- OpenAI. ChatGPT: Optimizing Language Models for Dialogue. [Online]. Available: https://openai.com/chatgpt
- Meta AI. LLaMA-2: Large Language Model Meta AI-2. [Online]. Available: https://ai.facebook.com/tools/llama
- AMI Consortium. AMI Meeting Corpus. [Online]. Available: http://corpus.amiproject.org
- ICSI. ICSI Meeting Corpus. [Online].
- Nedoluzhko A., Singh M., Hledíková M., Ghosal T., & Bojar O. (2022). ELITR Minuting Corpus. In Proceedings of LREC-2022 Marseille France June. ELRA. [Online].
- Facebook. Responsible AI Use and Research Guidelines for LLaMA. Meta AI. [Online]. Available: https://ai.meta.com/llama/responsible-use-guide/
- OpenAI. Usage Policies and Principles. [Online]. Available: https://openai.com/policies/principles/

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