



Mined Hackathon

Team: Deep Drillers

Team Members:

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TRACK:



Introduction

The Mined Hackathon challenges teams to develop innovative tools that can generate modern alternative content formats from a research paper as input. Each team is required to choose and work on one type of content generation, based on their comfort with the tech stack, such as **Computer Vision**, **Speech**, or **Natural Language Processing (NLP)**. The content formats include:

- **PPT (PowerPoint Presentation)**
- **Podcast**
- **Video**
- **Graphical Abstract**

The goal is to create a tool that can take a research paper as input and generate a variety of new-age alternative content formats to make the research more accessible and engaging.

Problem Statement

Research papers are often dense and complex, containing various sections that need to be explained in a simplified manner for better understanding. The key sections of a research paper include:

1. **Introduction**
2. **Methodology**
3. **Framework**
4. **Results**

Our team, Deep Drillers, has developed a model that addresses this challenge by summarizing the entire research paper in simpler yet technical terms. The model then expands the summary based on the user's requirements. Our solution offers the following features:

1. **Podcast Generation:**
 - The model generates a dialogue script for a podcast between two individuals: a host and an expert.
 - The script is then converted into audio using **Text-to-Speech (TTS)** technology.
2. **Video Generation:**
 - Using the summarized text and audio, the model creates a video where an AI-generated avatar speaks the summary, making the content more engaging and visually appealing.
3. **PPT Generation:**
 - The model formulates a PowerPoint presentation that explains the research paper in a structured and logical flow, making it easier for users to present or understand the content.

Proposed Approach

Our proposed approach involves the following steps:

1. **Input:** A research paper is provided as input to the system.
2. **Summarization:** The model summarizes the research paper into simpler yet technical language, covering all key sections (Introduction, Methodology, Framework, Results).
3. **Content Generation:**
 - **Podcast:** A dialogue script is generated, and TTS is used to convert it into an audio file.
 - **Video:** The summarized text and audio are combined to create a video featuring an AI avatar.

- **PPT:** A structured PowerPoint presentation is generated for easy explanation of the research paper.
- 4. **Output:** The user receives the generated content in their desired format (podcast, video, or PPT).

Our solution stands out for the following reasons:

1. **Accessibility:** It transforms complex research papers into easily digestible formats, making them accessible to a wider audience.
2. **Technical Accuracy:** While simplifying the content, our model maintains the technical accuracy of the research.
3. **Engagement:** The use of podcast-style dialogues, AI-generated videos with avatars, and structured PPTs ensures that the content is engaging and interactive.
4. **Multi-Format Output:** Our solution offers multiple output formats (audio, video, PPT), catering to different user preferences and needs.

Limitations

While our solution offers several advantages, there are some limitations that need to be addressed:

1. **Scalability Issues:**
 - Handling large volumes of research papers efficiently while maintaining output quality requires significant computational resources.
 - Our current model may face challenges in scaling up, but this is an area we plan to improve in the future.
2. **Data Privacy & Security:**
 - Research papers often contain sensitive or unpublished information.
 - Using cloud-based AI solutions raises concerns about data security and privacy, which need to be carefully managed.
3. **User Adoption & Trust:**
 - Researchers and academicians may be skeptical about AI-generated summaries and prefer traditional reading methods.
 - Building trust and encouraging adoption of our solution will be a key challenge.

User Interface

Our solution provides a user-friendly interface with the following options for the user:

1. **Podcast Audio File:** Users can generate and download a podcast-style audio file summarizing the research paper.
2. **Video with Avatar:** Users can create and download a video featuring an AI avatar that explains the research paper.
3. **PPT Presentation:** Users can generate and download a structured PowerPoint presentation for the research paper.

Conclusion

Our solution, developed by Team Deep Drillers, aims to revolutionize the way research papers are consumed and understood. By offering multiple formats (podcast, video, PPT) and maintaining technical accuracy, we make research content more accessible, engaging, and impactful for a wider audience. While there are challenges to overcome, such as scalability and user adoption, our model represents a significant step forward in the field of research communication.