VOTEX:Automatic Text Summarizer And Voice Generation

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Abstract- *Votex is a progressive system for automatic text overview and language generation, dealing with the growing need for fast, accessible information processing. Using NLP techniques (natural language processing), such as TF-IDF, the system extracts critical information from long documents, generates accurate summary, and at the same time maintains its essential importance. Additionally, VoTex Google Text-to-Speech (GTTS) converts text overviews into natural audio and integrates them to improve accessibility for visually impaired or auditory learning users. Support for several document formats, including PDFs and photos, provides scalable and user-friendly solutions for efficient content consumption in a variety of areas such as education, journalism, business, and more. Future improvements aim to include multilingual support,an expanded deep learning model, and real-time summary.*

Keywords- Natural Language Processing (NLP),TF-IDF(Term Frequency-Inverse Document Frequency), Text-to-Speech(TTS),GoogleText-to-Speech(gTTS)

I. INTRODUCTION

In today's fast-moving digital world, accessing information quickly and efficiently is extremely important. Vo-Tex is a system developed to automate text overview and language generation. This means that longer documents are more digestible and accessible. By using natural language processing (NLP) techniques such as TF-IDF, Vo- Tex extracts important insights from text and converts them into accurate summary. Additionally, Google Text-to- Speech (GTTS) integrates to provide an audio version of the summary that will be available to users who prefer hearing learning or who have visual impairments. With support for several file formats, including PDFs and photos, Vo-Tex improves accessibility and user-friendly in terms of information access in a variety of fields, including education, research, and journalism. Future improvements aim to introduce multilingual support, AI control summary and real-time processing.

II. IDENTIFY, RESEARCH AND COLLECT IDEA

The development of Votex is based on comprehensive research into textual information and language integration techniques. Various studies on automatic text overview (ATS) highlight the importance of extraction and abstract approaches in important information as well as condensing large texts. Research tasks such as "Surveying Automatic Text Summary: Progress, Processes, and Issues" examine a variety of summary techniques, including TF-IDFs and text runs, which are commonly used for extraction summary. Furthermore, research on optimization-based overviews and sentence ranking methods is below the opportunity to improve the consistency and relevance overview. OCR- based text extraction research provides insight into accessing text from scanned documents and images, allowing the summary system to handle various input dimensions. Furthermore, literature on language integration techniques such as Google Text-to-Speech (GTTS) and Deep-Rearning-based TTS models are ways to improve the naturalness of synthetic languages. In other words, it is a system for users who prefer audio-based content.

In addition to reviewing academic research, Vo-Tex was developed by examining various open source tools, NLP frameworks, and actual implementations available online. This project uses popular NLP libraries such as SCIKIT-LEARN (TF-IDF-based summary), NLTK (for stopping words removal), and Spacey (for language analysis) to improve the accuracy of the summary. GTTS (Google Text-to-Speech) is integrated for language integration to convert merged text into natural audio. Additionally, PYPDF2 and PYTESSERACT are used to extract text from PDFs and images to ensure wide compatibility of your docum ents. The system ' s development has been further passed by examining the text summary text summary for news aggregation, academic research, and assistive technology text summary. Votex combines research from academic research and practical implementations and is designed as a scalable, efficient and user-friendly solution that exists

III. STUDIES AND FINDINGS

Votex Development: Automatic Text Overview and Language Generation is driven by the need for efficient and accessible solutions for handling large volumes of text, while simultaneously providing an alternative to monitoring. This study focused on the evaluation of various text overview techniques for extracting text from images and PDFs, the TTS method (speech from text), and optical character detection (OCR).

The study showed that maintaining the original formulation is suitable for applications where maintaining the original formulation is essential, as the extraction summary maintains the original text structure. This study also explored advanced models such as text run and deep learning-based CAB approaching summaries (e.g., Bert, GPT models) that create new text summaries. However, due to complexity and resource limitations, a TF-IDF-based extraction summary was chosen for Votex. Additionally, OCR tools such as PYPDF 2 and Pytesser Act were integrated to extract text from PDF and image-based documents, increasing the system's user-friendly in a variety of content formats. Existing TTS systems such as Google Text-to-Speech (GTTS), Amazon Polly, and IBM Watson TTS have been evaluated. GTTS was chosen for its simplicity, multilingual support and efficient text-to- language conversion so that users can listen to the content. However, the limitations were high linguistic modulation and lack of natural language, which could be improved in the future by integrating a deep learning base into the TTS model. This gap between existing research and tools has led to the development of Vo-Tex as a uniform system that can summarise text and generate audio output in a single workflow.

The results show that adding multilingual support, AI- based summaries and real-time summaries can significantly improve the functionality of Vo-Tex in future iterations. Overall, Votex exhibits high efficiency, accessibility and scalability, making it a valuable tool for visually impaired students, professionals and users.

IV. GET PEER REVIEWED

To ensure the accuracy, effectiveness and ease of use of Votex, the project was subjected to a peer review process involving faculty, mentors and other researchers. This review aims to assess the technical implementation, efficiency and potential improvements of the system based on expert feedback.

1. Faculty and Mentor Feedback

The project was checked by faculty members, including Jiji A J (Project Guide) and Mr. Liya prakash (Project Coordinator) from the Faculty of Information Engineering, ICCS University' s Departm ent of Engineering Management and Management. Her feedback focuses on: Summary Accuracy: Teachers have increased the effectiveness of TF-IDF-based extractors, but proposed to examine deep learning-based abstract summaries of natural totals. language. File Processing Efficiency: The review pointed out potential performance issues in the processing of large PDF and image-based documents. This suggests optimisation of OCR processing speed and storage management.

2. Feedback from Peers and Test Users

Peers and fellow students tested VO-TEX to assess its user-friendliness and practical application. Their observations included:

- Ease of Use: Users found the interface intuitive and easy to navigate, with s imple f i le upload and summarization options.
- Dual Output Benefit: The availability of both text and audio summaries was appreciated, especially for students, professionals, and visually impaired users.
- Summary Accuracy: While the system provided concise and relevant summaries, some users suggested improving coherence using sentence ranking or NLP- based summarization.
- Language Support: Currently, Votex supports English and Malayalam, but users recommended adding more languages to increase accessibility

V. IMPROVEMENT AS PER REVIEWER COMMENTS

Feedback from faculty mentors and peer reviewers provided valuable insights into the functionality and improvements in user experience of VO-TEX: automatic text overview and language generation.

One of the main recommendations was to improve the accuracy of the summary by including abstract summary models such as BERT and GPT, rather than relying on extracted TF-IDF-based overviews. This improvement allows Vo-Tex to create more coherent and more human summary, improving readability and context-related relevance.

Although GTTS provides clear speech, reviewers recommended integrating the linguistic model (TTS) from expanded texts such as Tacotron and Wavenet to create a more natural and expressive audio summary. This greatly improves

the listening experience and makes tools for users who prefer hearing content more effective

Reviewers have discovered that current implementations using PYPDF2 and Pytesseract can be slower on large or complex documents. This increases the efficiency of file processing and text recognition.

The current version supports English and Malayalam, but future updates will include more regional and international languages to ensure more accessibility. .

VI. CONCLUSION

Votex Development: Automatic text overview and language generation address the growing need for efficient and accessible information processing. By integrating text overview, language synthesis and OCR, Votex offers a uniform solution that improves readability and accessibility for a wide range of users. This project demonstrates how to effectively combine natural language processing technologies, such as TF-IDF-based overviews, with Google Text-to-Speech (GTT) to provide quick and accurate summary and access important information from Votex students, experts and visually impaired. Future improvements such as abstract overview, advanced TTS models, multilingual support, and real-time overview will further expand ease of use and effectiveness. This project will lay the foundation for future development of AI-controlled summarization tools, paving the way for a more intelligent, accessible and user-friendly information calling system.

VII. APPENDIX

A. Tools and Technologies Used

- Programming Language: Python 3.7+
- Natural Language Processing (NLP) Libraries:

- scikit-learn – TF-IDF implementation for extractive summarization
- NLTK – Tokenization and stop-word removal
- spaCy – Linguistic processing and Named Entity Recognition (NER)
  - Text-to-Speech (TTS) Library: Google Text-to- Speech (gTTS)
  - Optical Character Recognition (OCR):
- PyPDF2 – Extracting text from PDFs
- PyTesseract – Extracting text from scanned images
  - User Interface: Python Tkinter (for GUI-based file selection)

B. System Specifications

Software Requirements:

- Python 3.7+ with required NLP and TTS libraries
- scikit-learn, NLTK, spaCy, PyPDF2, pytesseract, gTTS
- Operating System: Windows/Linux/macOS
- Internet Connection: Required for installing dependencies and using gTTS

Hardware Requirements:

- Processor: Minimum dual-core Intel i5 or AMD Ryzen 3 (Recommended: Intel i7/i9 or AMD Ryzen 5/7)
- RAM: Minimum 8GB (Recommended: 16GB for larger datasets)
- Storage: Minimum 256GB SSD (Recommended: 512GB SSD)
- GPU: Not required, but NVIDIA GTX 1660 or higher is beneficial for future AI model enhancements

B. Sample Summarization Output

Input Document (Excerpt):

"Artificial Intelligence (AI) is transforming industries worldwide. From healthcare to finance, AI-driven solutions are optimizing processes, improving accuracy, and enhancing decision-making. Machine learning and deep learning models have enabled significant advancements, making automation more efficient and scalable."

Generated Summary:

"AI is revolutionizing industries by optimizing processes and improving decision-making using machine learning and deep learning models.

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