ABSTRACT

Synapse

WHERE AI MEETS EDUCATION

PRESENTATION

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Contents

Introduction

- Digitize resources, making learning materials more accessible and interactive
- Comprehensive tool for effective note-taking, and interactive learning
- Transforms text images into editable and searchable digital content
- AI Chatbot to interact conversationally, answering questions and summarize
- Speech-to-Text, Text-to-Speech, and language translation
- Providing a scalable, user-friendly platform that bridges the gap between traditional and modern educational practices.

Problem Statement

Interactive AI Platform for Seamless Note-Taking, Chatbot Assistance, and Multilingual Learning in Educational Institutions

Description

To develop an AI-powered platform that seamlessly converts text images into fully editable and searchable digital content. This platform will use Optical Character Recognition, Natural Language Processing techniques, and multilingual support to offer interactive features such as an AI-driven chatbot, real-time translation, and speech integration.

Scope

- Efficient note-taking and learning by converting text images into editable, searchable digital formats for easy access and management
- AI Chatbot engages users in conversation to clarify concepts, answer questions, and provide explanations, enhancing the learning experience
- Support diverse learning preferences by providing alternative methods
- Facilitates the exchange of knowledge across different linguistic and cultural backgrounds

Detailed subject-specific analysis or content generation beyond basic summarization and translation is exculded

Methodologies

01

Image Processing and Enhancement

- OpenCV: Image processing tasks such as resizing, filtering, and preprocessing before OCR
- Pillow (PIL): Basic image manipulation tasks

02

Optical Character Recognition

- Efficient and Accurate Scene Text Detector
- Tesseract OCR: Open-source OCR engine for extracting text from images
- Google Cloud Vision API: Text extraction from diverse image types

Methodologies

03

Natural Language Processing

- Bidirectional Encoder Representations from Transformers (BERT): Understanding context and generating summaries
- Generative Pre-trained Transformer: Text generation and conversational AI tasks

04

Translation

- Google Cloud Translation API: Cloud service for translating text into multiple languages
- Microsoft Translator Text API: Another cloud-based translation service supporting a wide range of languages

Methodologies

05

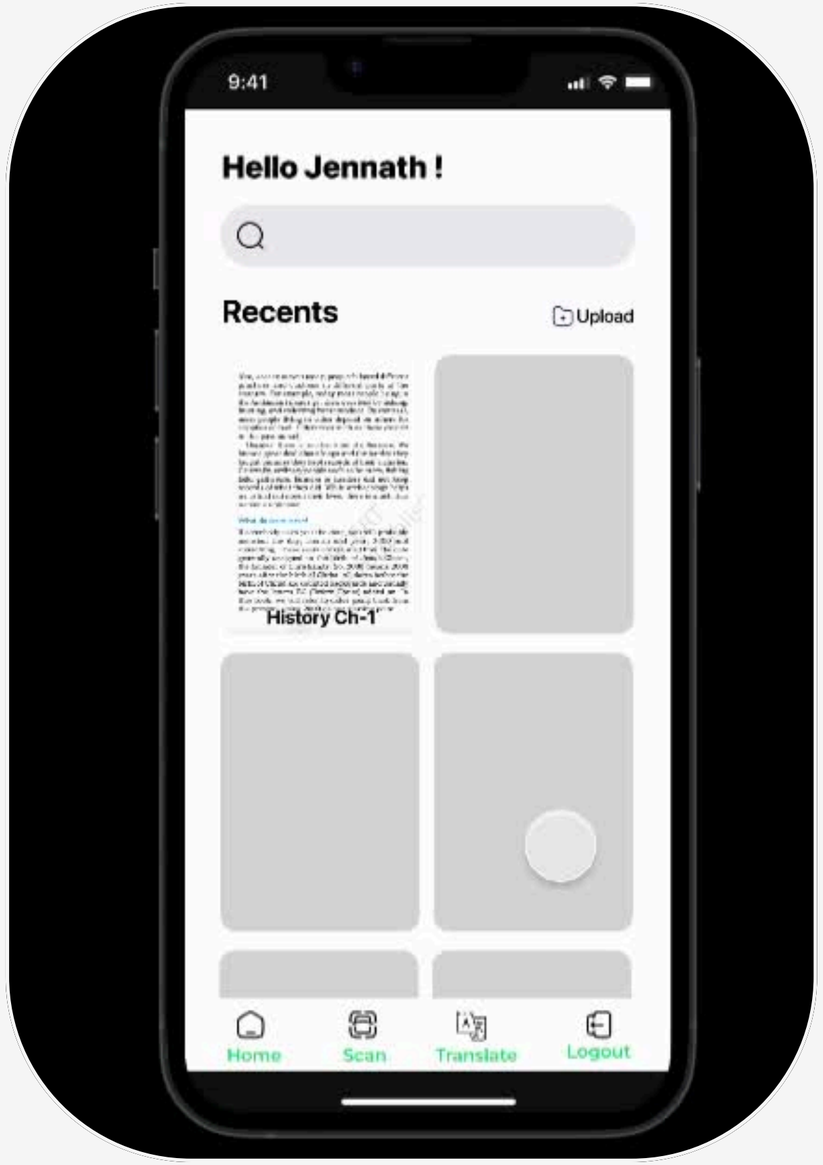
Chatbot

- Dialogflow: Google’s NLP platform for building conversational agents and chatbots
- Rasa: Open-source framework for developing conversational AI and chatbots with custom NLP capabilities

06

Speech-to-Text Text-to-Speech

- Google Cloud Speech-to-Text API: Converts spoken language into written text
- Tacotron 2: A Google model for text-to-speech that generates natural-sounding speech from text



01 Text Recognition

02 Text Extraction

03 Note Organization

04 Multilingual Support

05 Interactive Chatbot

06 Summerization

07 Speech-to-Text

08 Text-to-Speech

Key Features

Text Recognition

Extracts and digitizes textbook and handwritten notes for easy editing and searching

Text Extraction

Converts images of text into editable and searchable digital content using advanced OCR technology

Note Organization

Categorizes and organizes digital notes based on content and user-defined criteria.

Multilingual Support

Translates text into multiple languages to cater to diverse linguistic backgrounds.

Key Features

Interactive Chatbot

Provides conversational interaction with notes, including answering questions and generating summaries

Text Summarization

Automatically summarizes lengthy texts to highlight key points and essential information.

Speech-to-Text

Converts spoken language into written text for improved accessibility and interactive learning

Text-to-Speech

Reads aloud text content to support auditory learning and accessibility needs.

Requirements

- Frontend Development: React.js and React Native
- Backend Development: Python and Django
- OCR and Image Processing: Tesseract OCR, OpenCV, and Pillow (PIL)
- NLP and Machine Learning: spaCy, NLTK, and Transformers
- Chatbot and Conversational AI: Dialogflow and Rasa
- Translation Services: Google Cloud and/or Microsoft Translator API
- Speech Processing: Google Cloud Speech-to-Text API and Text-to-Speech API

Requirements

- Processor: Intel Core i5 or AMD Ryzen 5 (minimum); Intel Core i7 or AMD Ryzen 7 (recommended)
- RAM: 8 GB (minimum); 16 GB or more (recommended)
- Storage: 256 GB SSD (minimum); 512 GB SSD or higher (recommended)
- Graphics Card: Integrated graphics are sufficient for development; dedicated GPU recommended for intensive tasks like machine learning.
- Operating System: Windows 10 or 11, macOS, or a Linux distribution.

Conclusion

"Synapse" is an AI-powered platform that transforms text images into editable digital content, enhancing the educational experience through advanced OCR, NLP techniques, and interactive features.

- Converts printed and handwritten content into editable digital formats, enhancing accessibility and organization
- Provides real-time, interactive management of notes through conversational AI, improving user engagement and efficiency.
- Text summarization, speech processing, and efficient note organization to support diverse learning needs and streamline educational practices.

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Thank You

DO YOU HAVE ANY QUESTIONS?

SYNAPSE

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