

**Mobile Base Sinhala Book
Reader for Visually Impaired
Individuals**

TMP-23-198



Logbook

Bhagya H.D.M

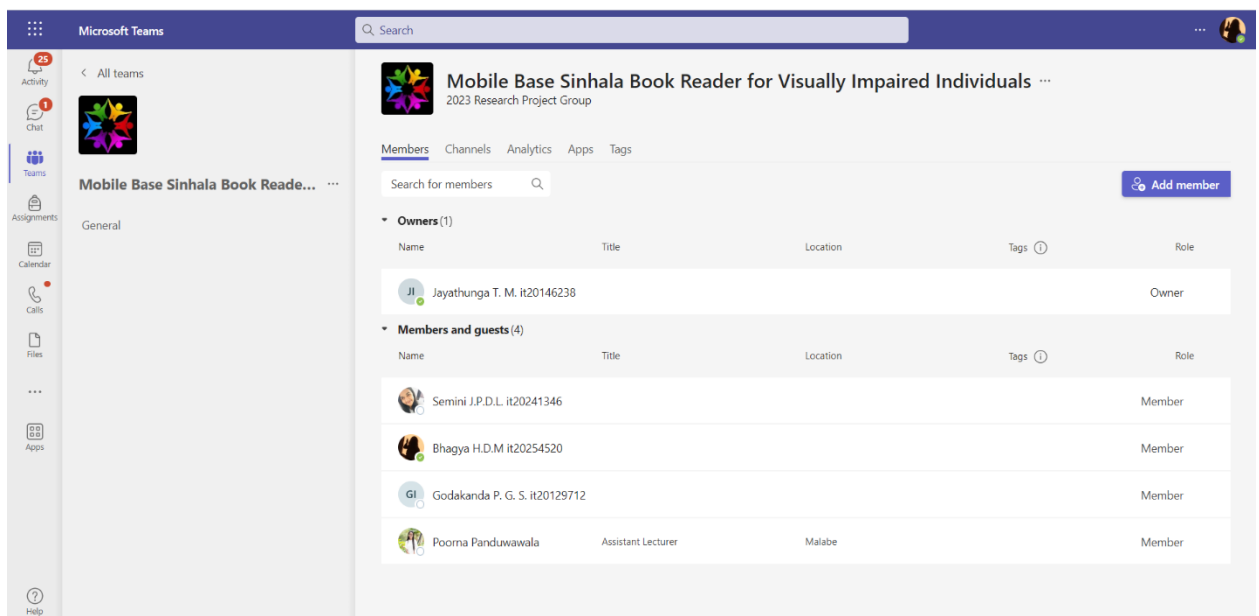
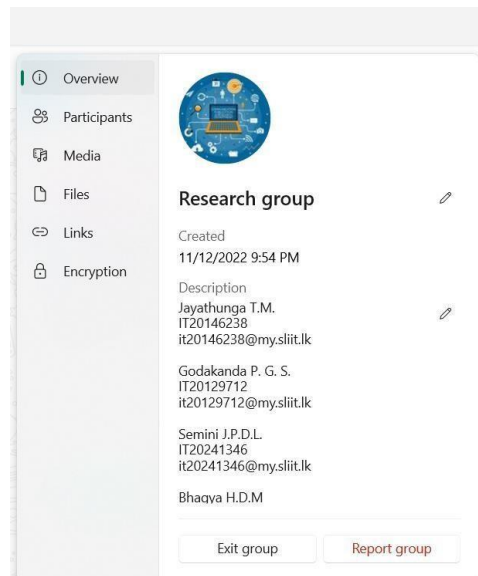
IT20254520

Bachelor of Science (Hons) Degree in Information
Technology Specializing in Information Technology

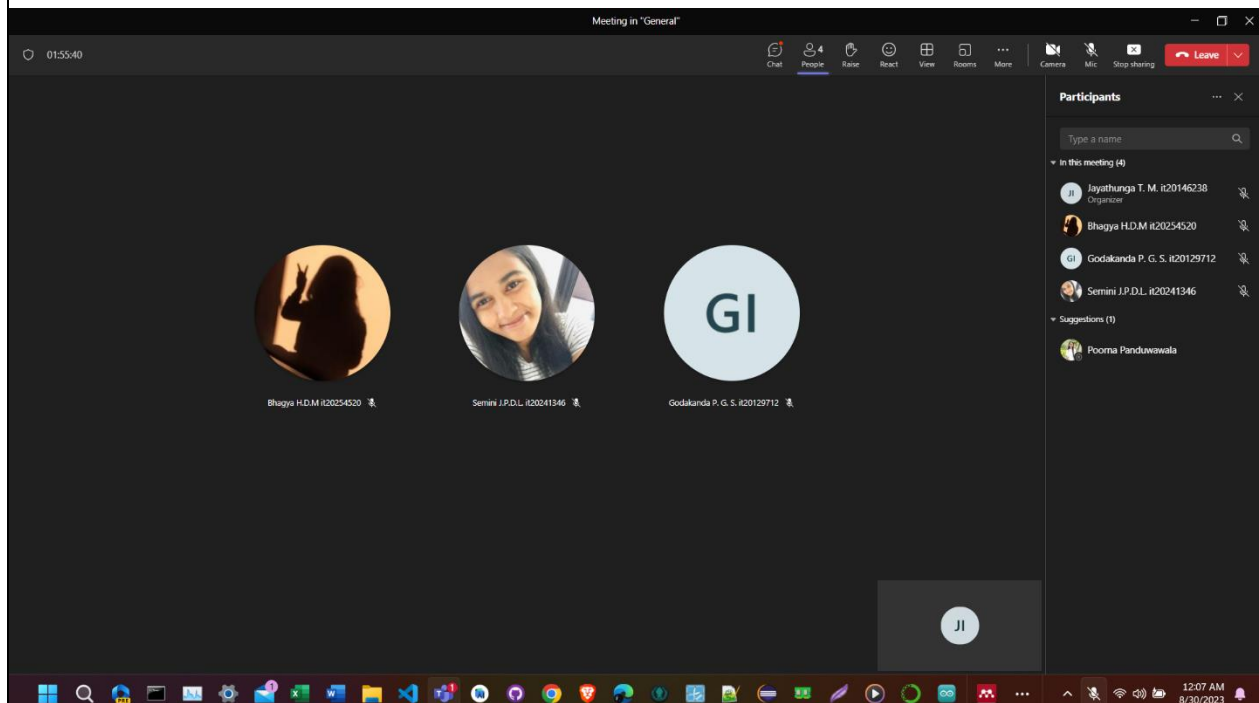
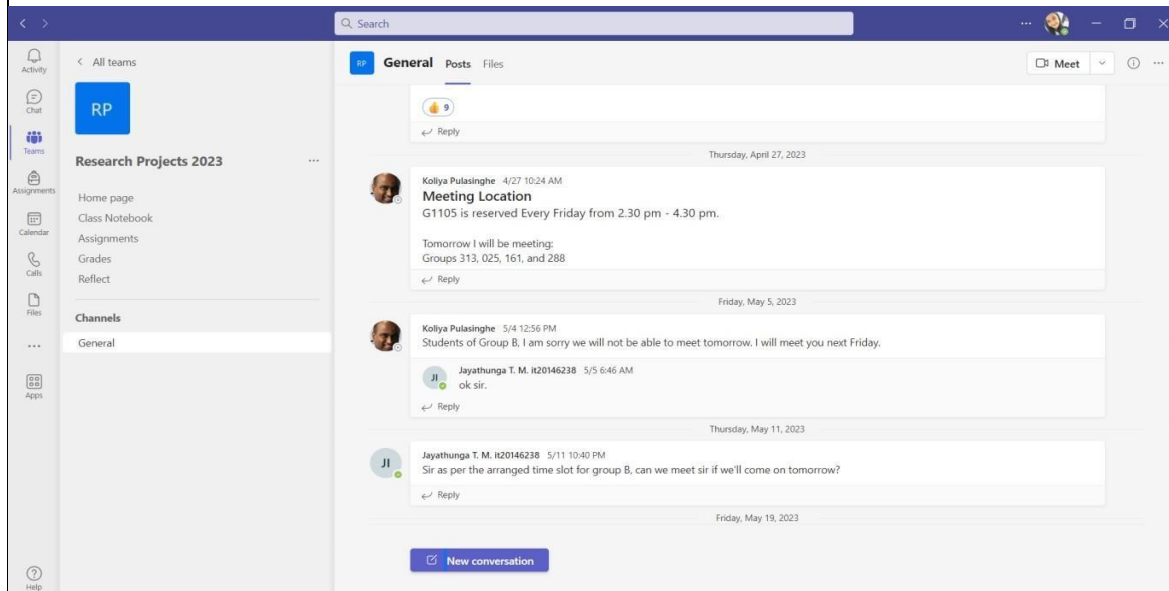
Sri Lanka Institute of Information Technology
Sri Lanka

October 2023

- Establish a WhatsApp group.
- Utilize WhatsApp group calls to converse about selecting a topic.
- Each of the four team members should independently research potential topics.
- Consult with our more experienced colleagues for guidance and advice..



- Once we've chosen a topic, we'll create a document containing the research problem and its proposed solution.
- We will send emails to professors to request them to become our group's supervisor and co-supervisor.
- Subsequently, we received an acceptance email from supervisor and co-supervisor



- Uploaded our Topic Assessment Form (TAF) document to the



IT4010 – Research Project - 2023
Topic Assessment Form

10. Supervisor checklist (supervisors should fill sections 10 and 11)

Page 14 of 25

Summary Sheet

The topic evaluation panel will use the summary sheet to evaluate the suitability of the project

1. Brief description of research problem including references (200 – 300 words max)

Blind people face several challenges when reading books, but the main problem is a lack of accessibility to printed materials. Despite advancements in assistive technology, such as text-to-speech software and Braille displays, most books are still not accessible to blind individuals in an easily readable format. This can limit the opportunities for blind people to gain knowledge, engage in literary experiences, and improve their education and employment prospects.

One issue is the cost of specialized devices and software, which can be prohibitively expensive for many blind people. Even when these tools are available, they may not provide an experience that is comparable to reading a traditional printed book. For example, text-to-speech software can struggle with complex language and formatting, and Braille displays can be slow and clunky.

Another issue is the limited availability of audiobooks and Braille materials. While more audiobooks are being produced, the selection is still limited compared to the vast number of printed books. Braille books are even harder to come by, as the process of translating printed books into Braille is time-consuming and costly. This means that blind people may not have access to the latest best-selling books or popular educational materials.

Page 17 of 30

- Submitting project charter.

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PROJECT REGISTRATION FORM

(This form should be completed and uploaded to the Cloud space on or before XXXXXXXXX)

The purpose of this form is to allow final-year students of the B.Sc. (Hon) degree program to enlist in the final-year project group. Enlisting in a project entails specifying the project title and the details of four members in the group, the internal supervisor (compulsory), the external supervisor (may be from the industry), and indicating a brief description of the project. The description of the project entered on this form will not be considered as the formal project proposal. It should however indicate the scope of the project and provide the main potential outcome.

PROJECT TITLE
(As per the accepted
Topic Assessment Form)

Mobile Base Sinhala Book Reader for Visually Impaired
Individuals

RESEARCH AREA
(As per the Topic
Assessment Form)

Natural Language Processing (NLP)

PROJECT NUMBER

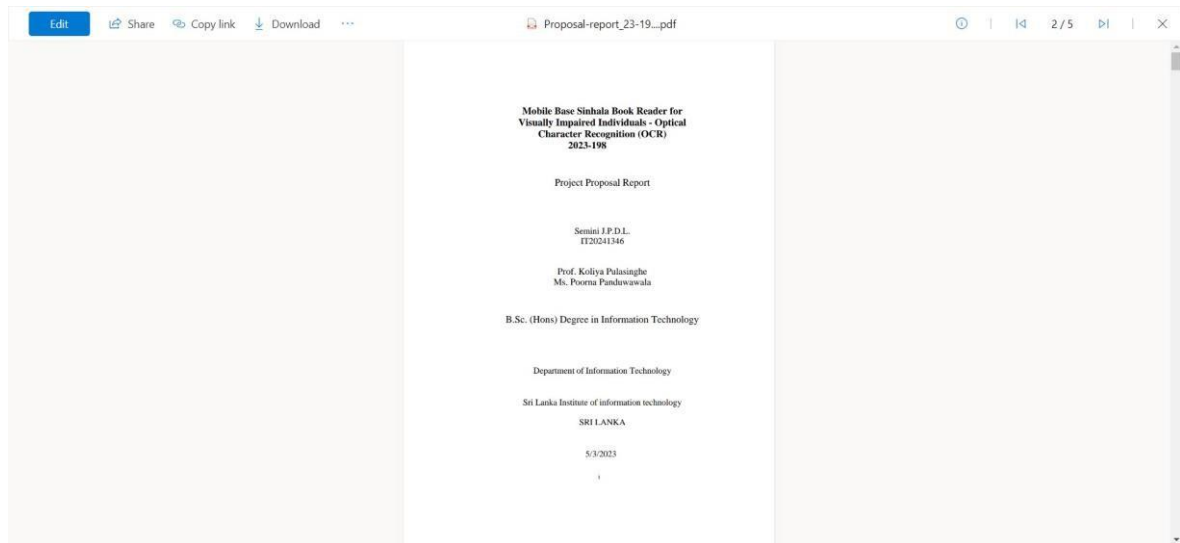
TMP-23-198

(Will be assigned by the RP Team)

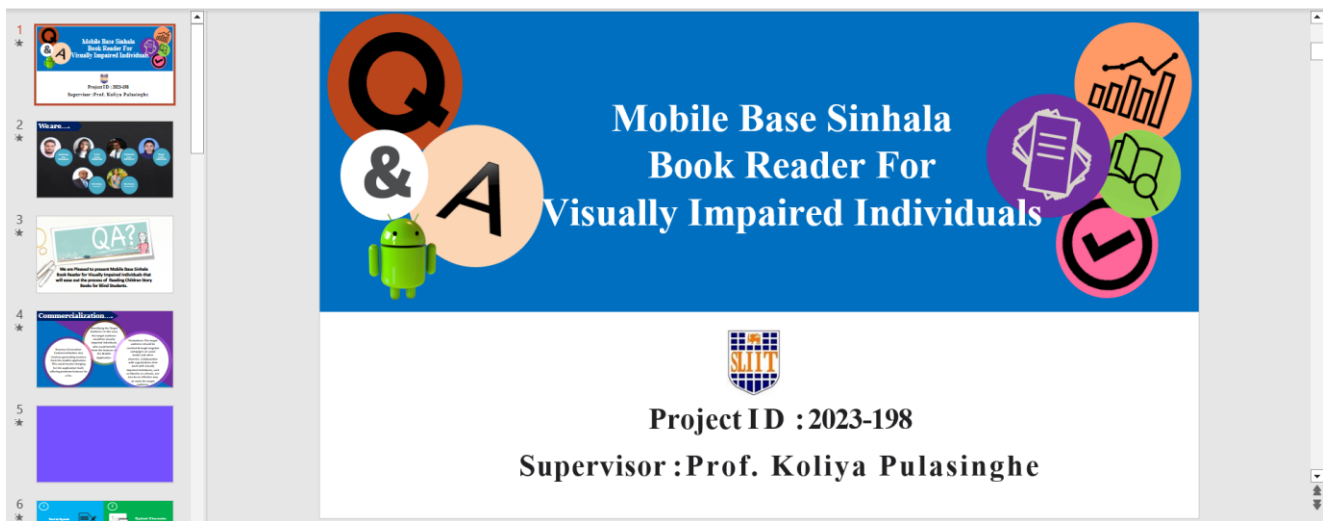
PROJECT GROUP MEMBER DETAILS: (Please start with the group leader's details)

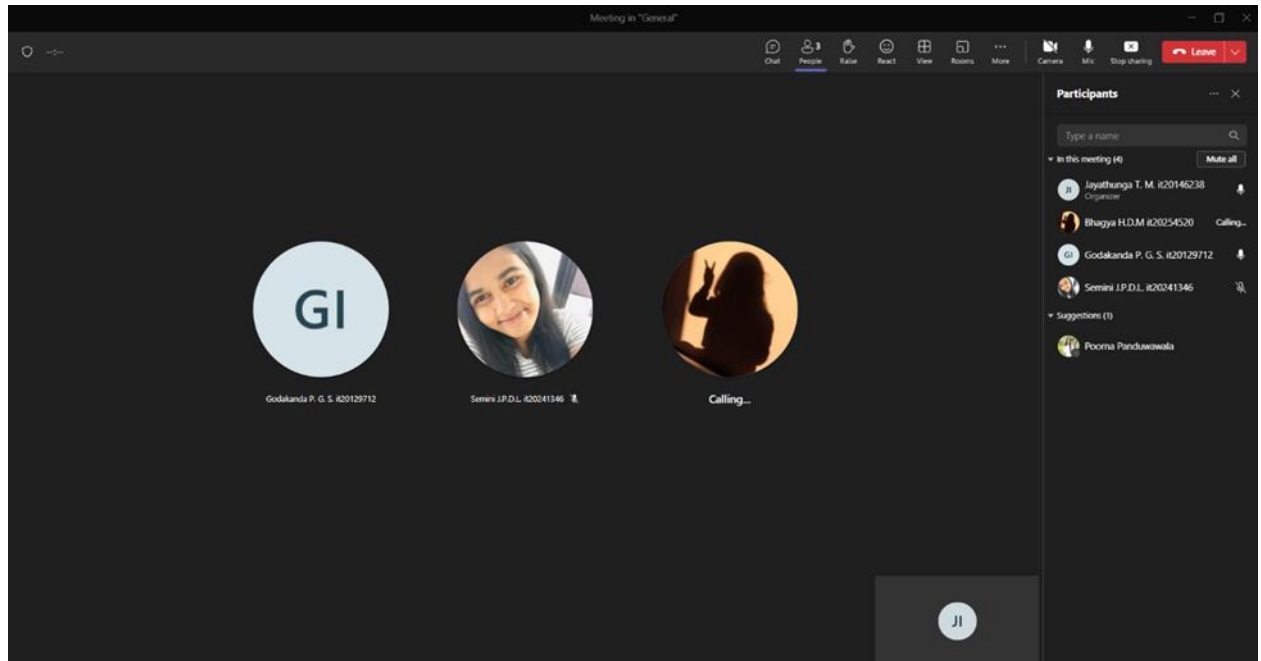
	STUDENT NAME	STUDENT NO.	CONTACT NO.	EMAIL ADDRESS
1	Jayathunga T.M.	IT20146238	0775338747	it20146238@my.sliit.lk
2	Godakanda P.G.S.	IT20129712	0715394065	it20129712@my.sliit.lk
3	Semini J.P.D.L.	IT20241346	0752608871	it20241346@my.sliit.lk
4	Bhagya H.D.M.	IT20254520	0774405896	it20254520@my.sliit.lk

- Submitting proposal report.

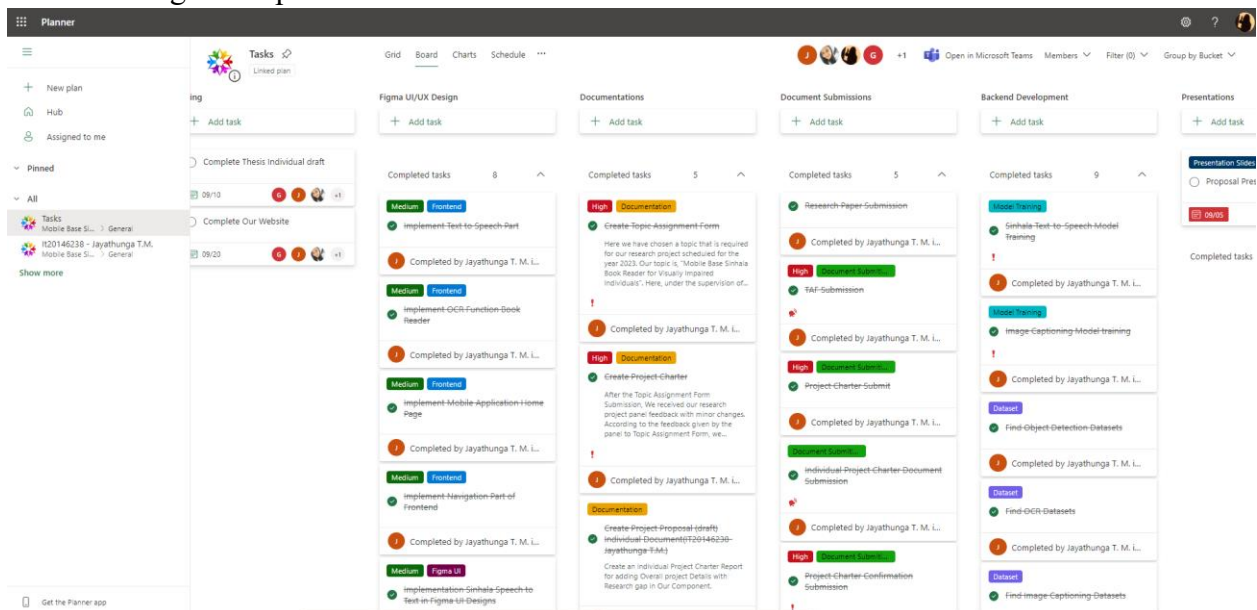


- Started Creating the proposal presentation slides.
- Practiced for the proposal presentation through teams meeting with the group members

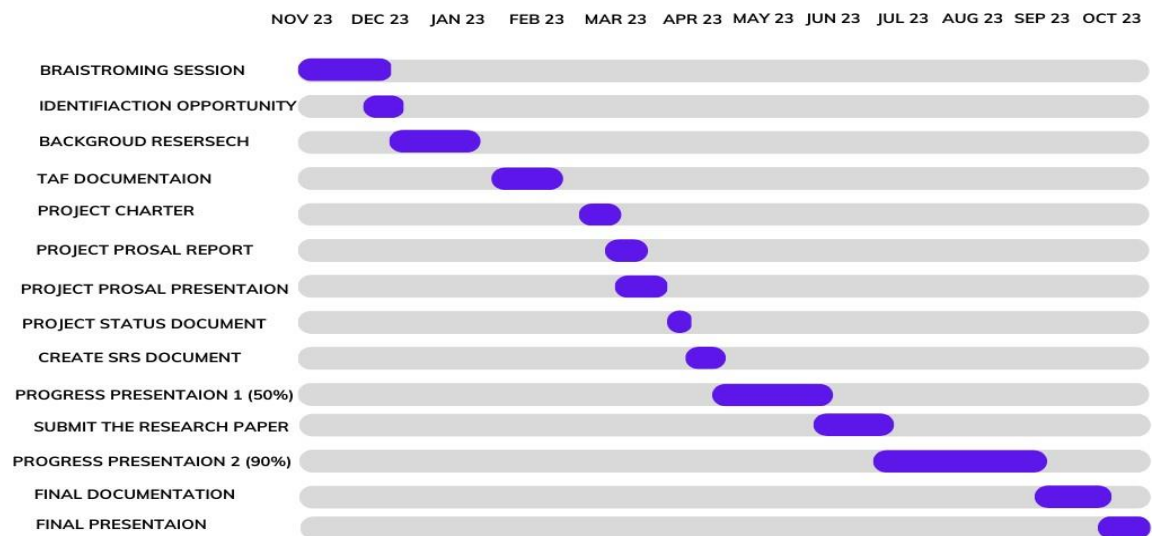




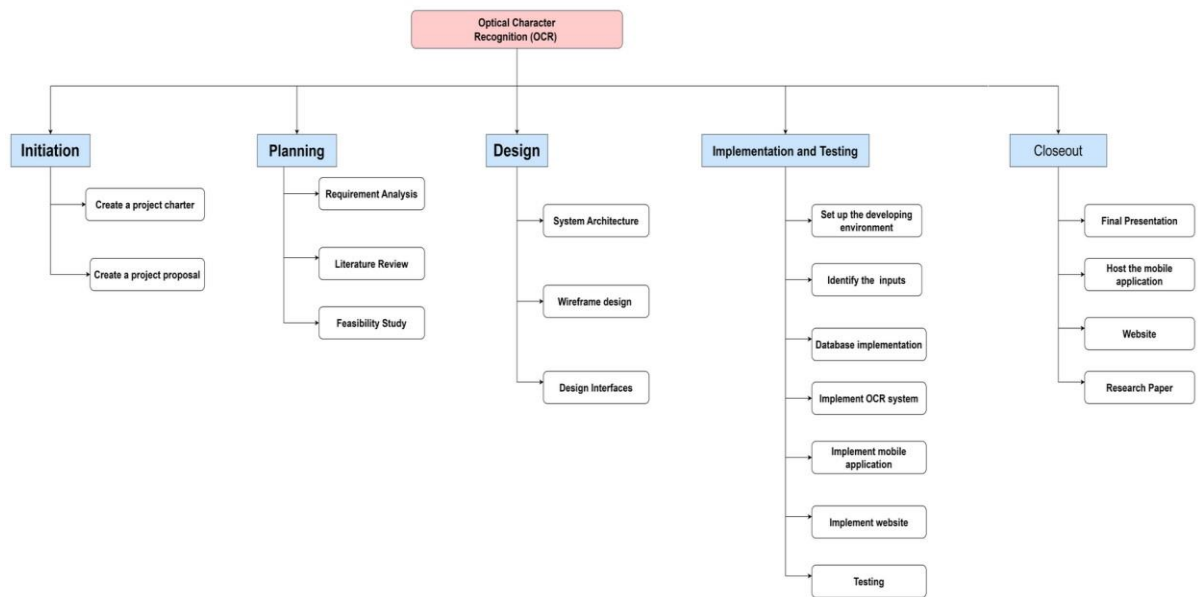
- Making a task planner with team members .




- Making the Gantt chart. We continued to work on our proposal report.



- We conducted additional in-depth research on machine learning algorithms like CNN and RNN.
- We delved into more research papers.
- We initiated the process of implementing our findings.
- Making system breakdown chart .



- Getting the field visit permission letter .


SRI LANKA
INSTITUTE OF INFORMATION TECHNOLOGY
16th Floor, BoC Merchant Tower, No. 28, St. Michael's Road, Colombo 03

Date: 28/04/2023

Your Ref :

My Ref : 2023-198

The Ceylon School for the Deaf &
Blind RDC Donations office 521,
Galle Road,
Ratmalana
Sri Lanka

Dear Sir / Madam,

Certifying the project titled "Mobile Base Sinhala Book Reader for Visually Impaired Individuals" is conducting as a BSc in IT final year research project.

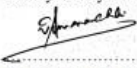
The Sri Lanka Institute of Information Technology (SLIIT) is the largest Degree Awarding Institute in the field of information Technology recognized by the University Grants Commission under the Universities Act. It was established in the year 1999 to educate and train Information Technology (IT) Professionals required by the fast-growing IT Industry in Sri Lanka.

This letter is to certify that the following students.
IT20146238 - Jayathunga T.M.
IT20129712 - Godakanda P.G.S.
IT20241346 - Semini J.P.D.L.
IT20254520 - Bhagya H.D.M.

They are final year undergraduate students who conduct research entitled "Mobile Base Sinhala Book Reader for Visually Impaired Individuals" as partial fulfillment of the B.Sc. in Information Technology degree at Sri Lanka Institute of Information Technology (SLIIT). The students are conducting the research under the supervision of Prof. Koliya Pulasinghe

I kindly request your assistance in enabling these students to collect data from your organization to build their dataset for the research project. If you have any questions or require further clarification about the project, please do not hesitate to contact me.

Thank you for your cooperation


.....
Dr. Jayantha Amararachchi
Assistant Professor/
Research Project Coordinator,
jayantha.a@slit.lk
+94 11 754 4103

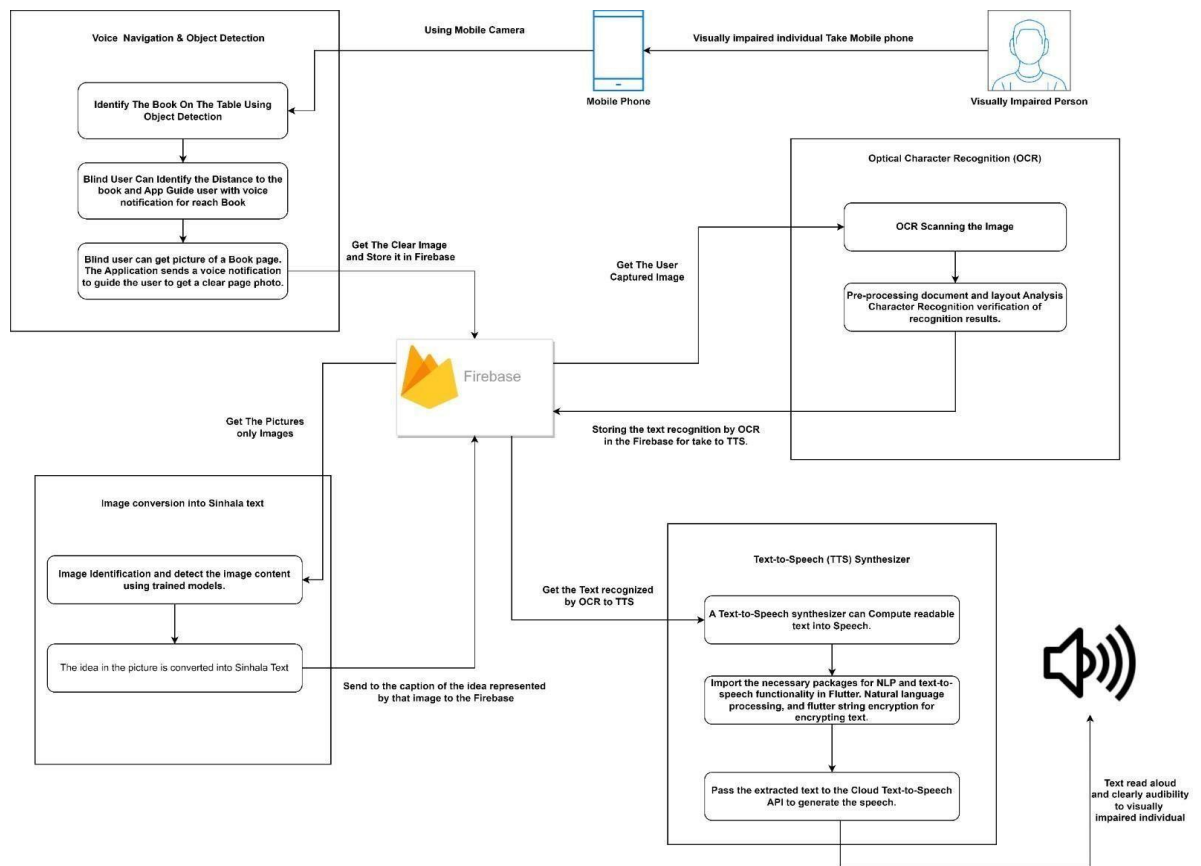
Tel: +94(0)11 2301904 - 5

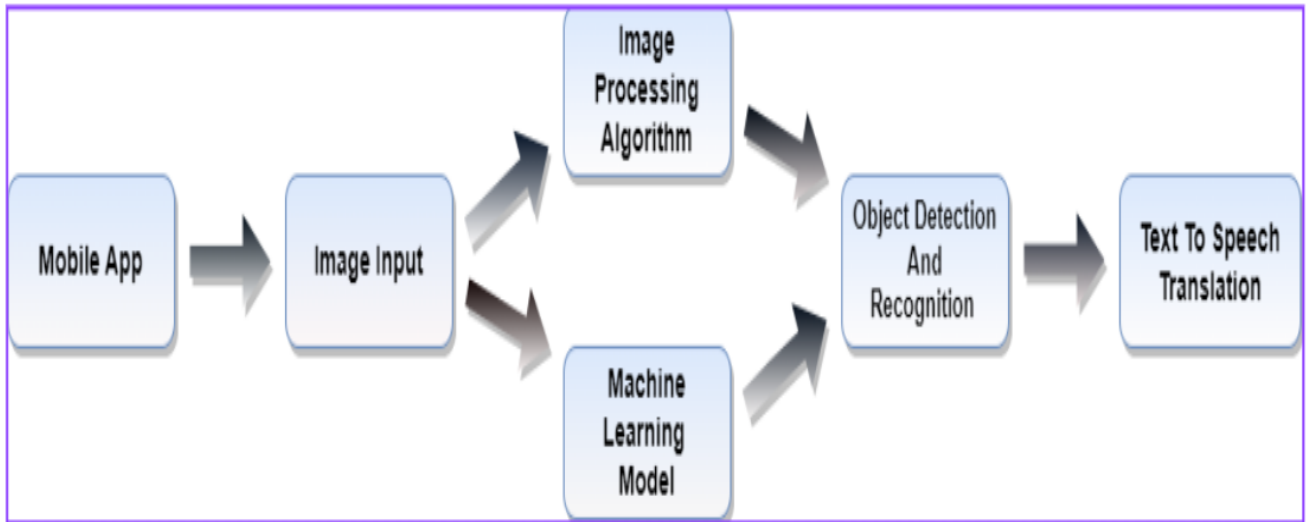
Fax: +94(0)11 2301906

E-mail: info@slit.lk

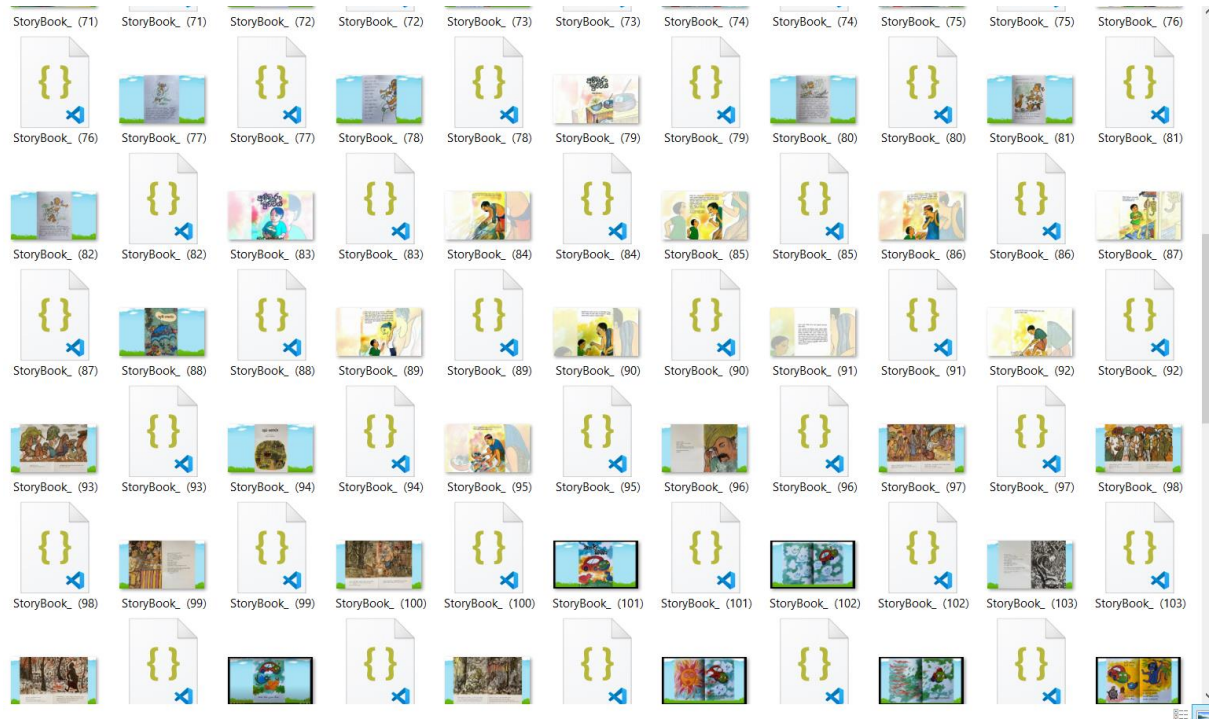
URL: www.slit.lk

• Designing the system overview diagram .





- Creating dataset and labeling



- Submitting status document 1

**Mobile Base Sinhala Book Reader for Visually Impaired
Individuals**
Project ID: 2023_198

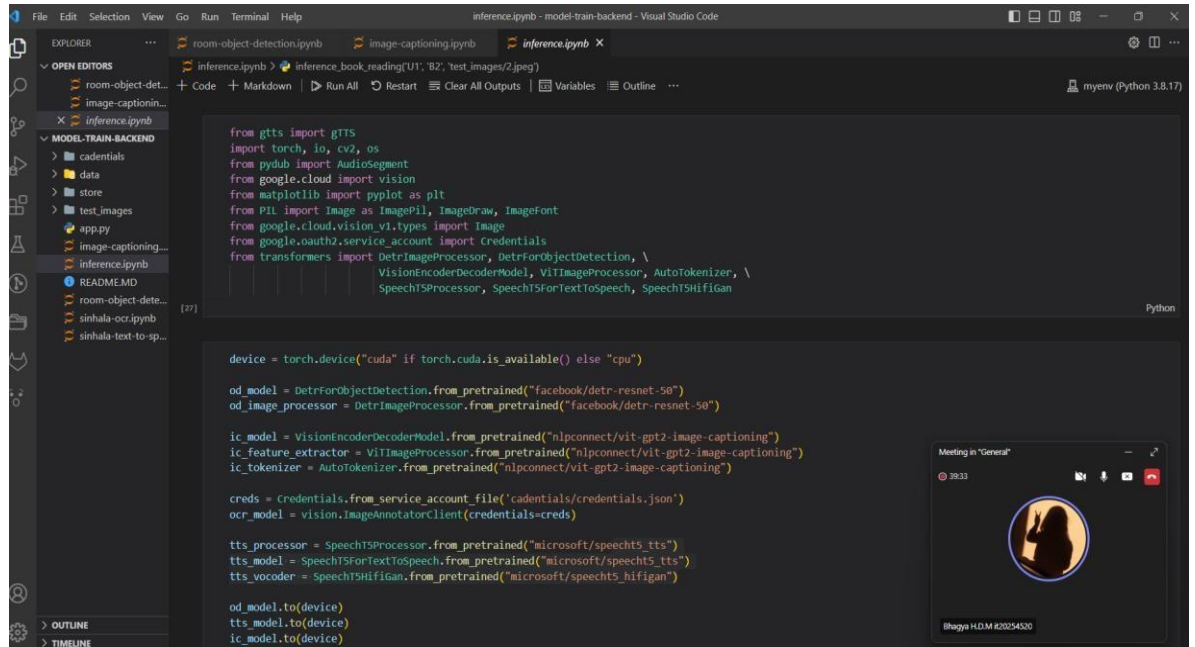
Status Document 1|
Bhagya H.D.M – IT20254520

Bachelor of Science (Hons) Degree in Information Technology Specializing
in Information Technology

Department of Information Technology
Faculty of Computing

Sri Lanka Institute of Information Technology Sri
Lanka

- Dataset processing and training .Backend implementations



```

from gtts import gTTS
import torch, io, cv2, os
from pydub import AudioSegment
from google.cloud import vision
from matplotlib import pyplot as plt
from PIL import Image as ImagePIL, ImageDraw, ImageFont
from google.cloud.vision.v1.types import Image
from google.oauth2.service_account import Credentials
from transformers import DetrImageProcessor, DetrForObjectDetection, \
    VisionEncoderDecoderModel, ViTImageProcessor, AutoTokenizer, \
    SpeechT5Processor, SpeechT5ForTextToSpeech, SpeechT5Hifigan

device = torch.device("cuda" if torch.cuda.is_available() else "cpu")

od_model = DetrForObjectDetection.from_pretrained("facebook/detr-resnet-50")
od_image_processor = DetrImageProcessor.from_pretrained("facebook/detr-resnet-50")

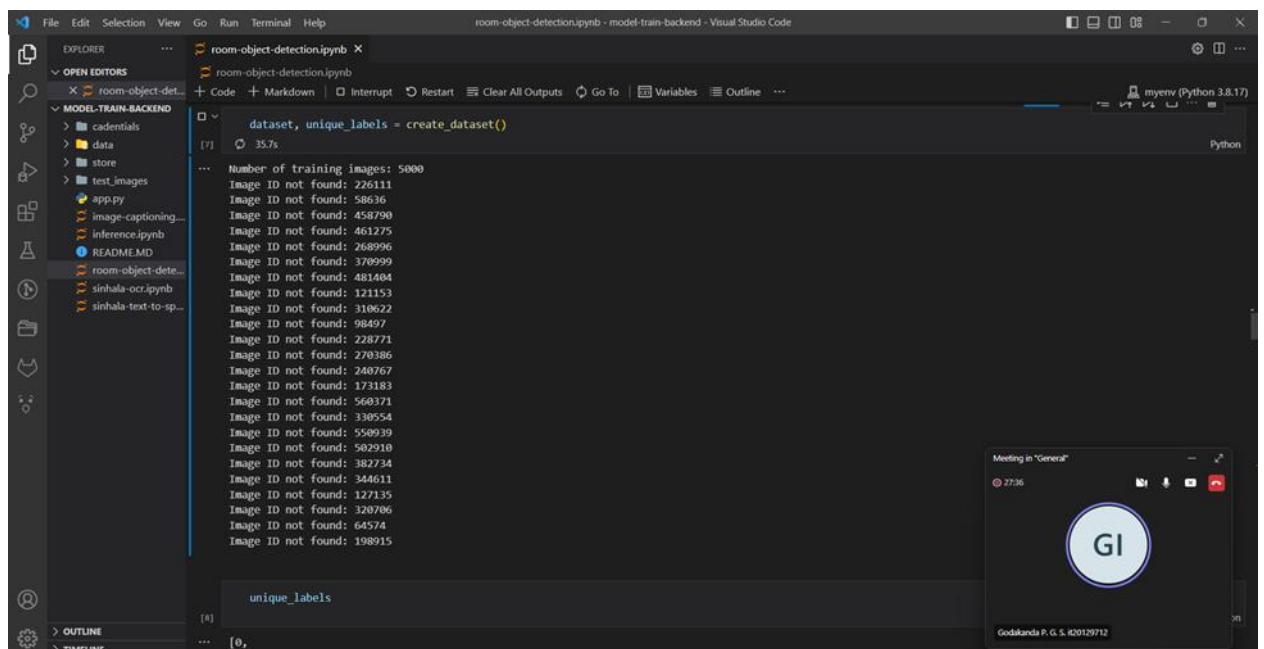
ic_model = VisionEncoderDecoderModel.from_pretrained("nlpconnect/vit-gpt2-image-captioning")
ic_feature_extractor = ViTImageProcessor.from_pretrained("nlpconnect/vit-gpt2-image-captioning")
ic_tokenizer = AutoTokenizer.from_pretrained("nlpconnect/vit-gpt2-image-captioning")

creds = Credentials.from_service_account_file('cadentials/credentials.json')
ocr_model = vision.ImageAnnotatorClient(credentials=creds)

tts_processor = SpeechT5Processor.from_pretrained("microsoft/speecht5_tts")
tts_model = SpeechT5ForTextToSpeech.from_pretrained("microsoft/speecht5_tts")
tts_vocoder = SpeechT5Hifigan.from_pretrained("microsoft/speecht5_hifigan")

od_model.to(device)
tts_model.to(device)
ic_model.to(device)

```



```

dataset, unique_labels = create_dataset()

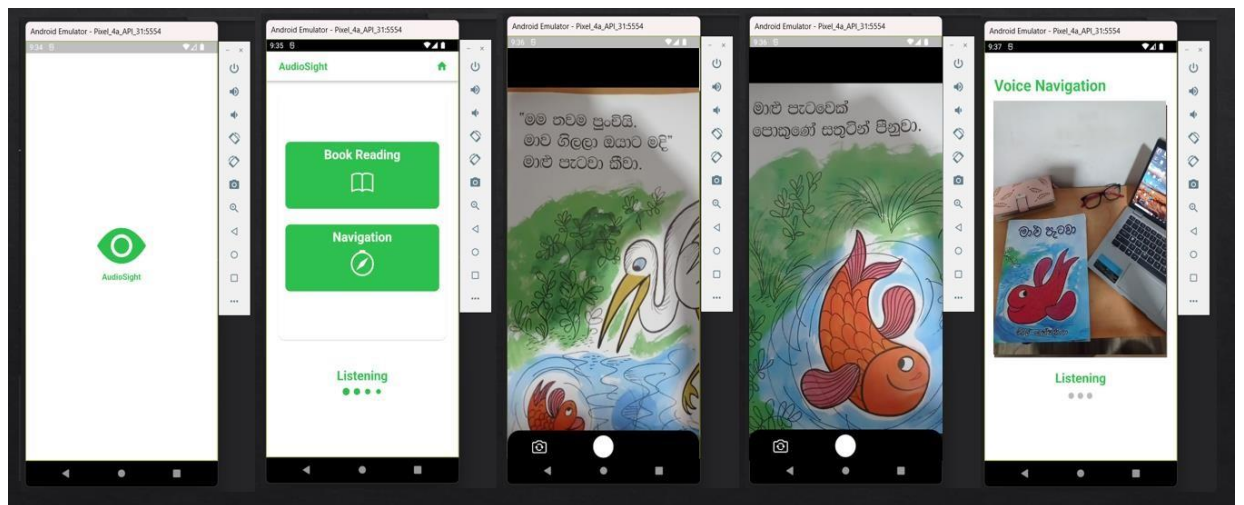
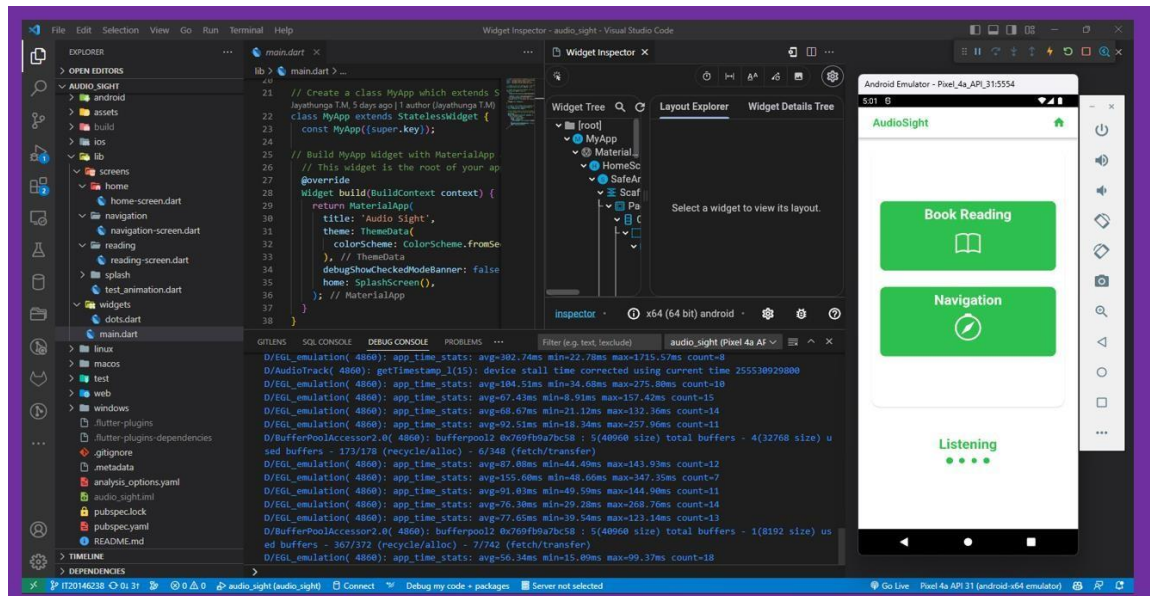
...
Number of training images: 5000
Image ID not found: 226111
Image ID not found: 58636
Image ID not found: 458790
Image ID not found: 461275
Image ID not found: 268996
Image ID not found: 370999
Image ID not found: 481484
Image ID not found: 121153
Image ID not found: 310622
Image ID not found: 98497
Image ID not found: 228771
Image ID not found: 270386
Image ID not found: 240767
Image ID not found: 173183
Image ID not found: 568171
Image ID not found: 330554
Image ID not found: 550939
Image ID not found: 502910
Image ID not found: 382734
Image ID not found: 344611
Image ID not found: 127135
Image ID not found: 320706
Image ID not found: 64574
Image ID not found: 198915

unique_labels

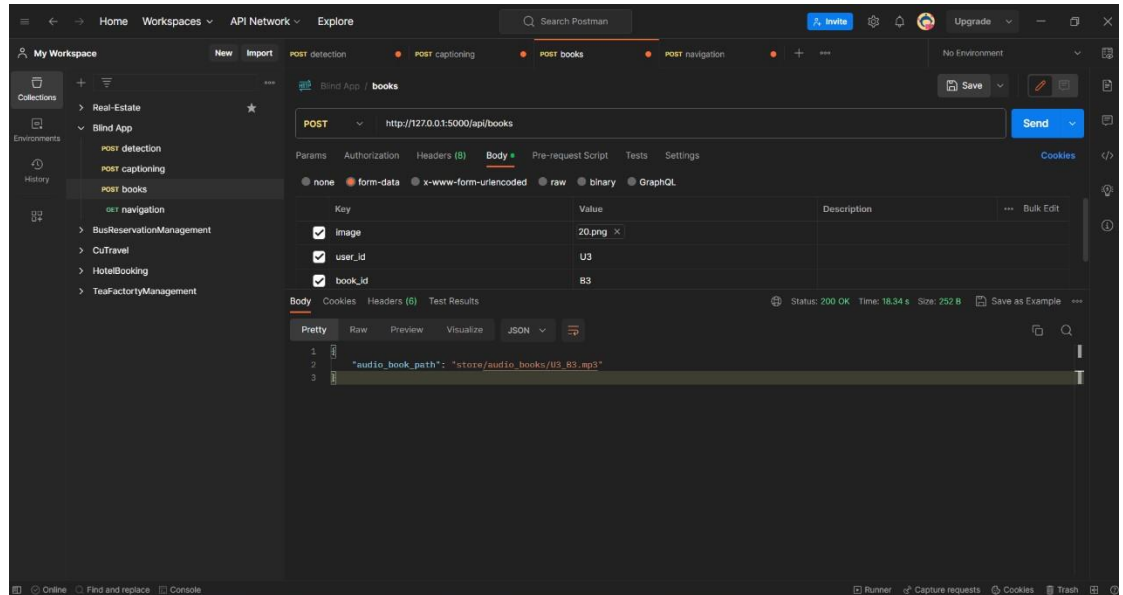
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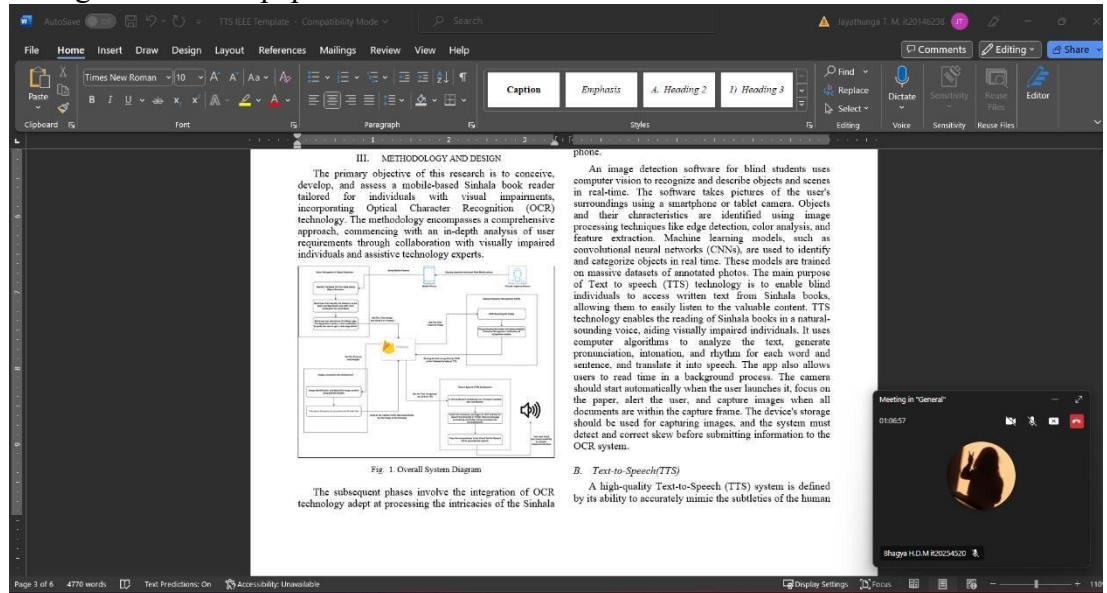
- Frontend implementations



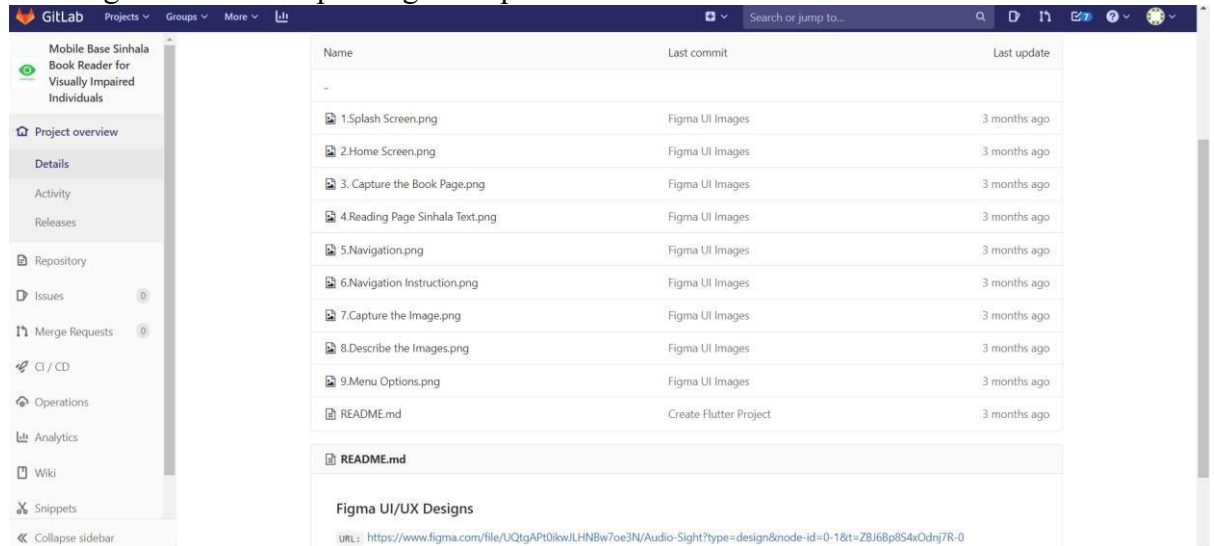
- API testing



- Making the research paper .



- Creating the Gitlab and pushing all implementations to it.



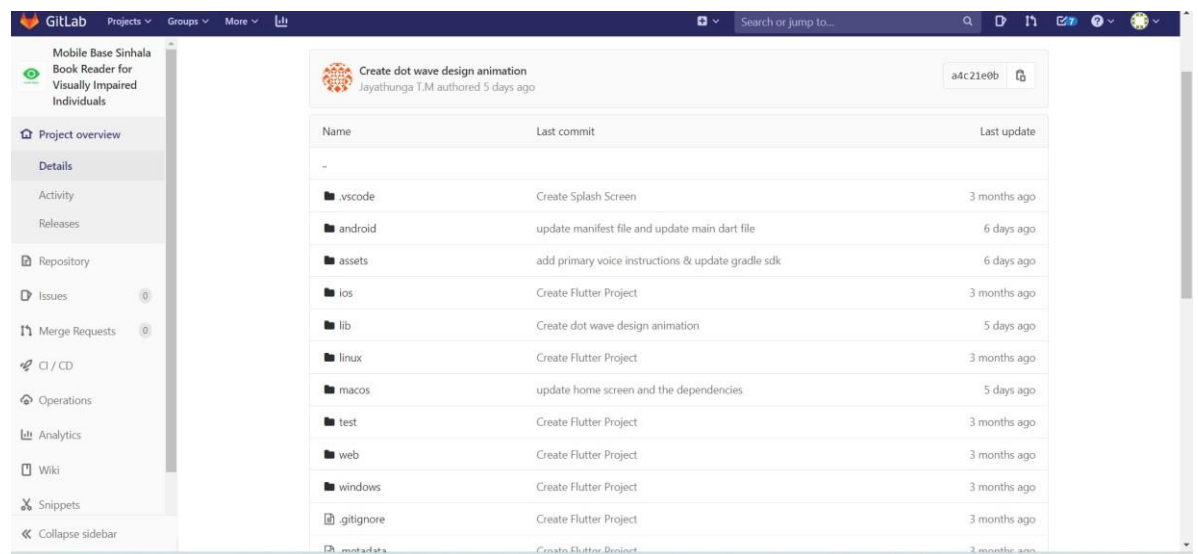
The screenshot shows the GitLab interface for a project named "Mobile Base Sinhala Book Reader for Visually Impaired Individuals". The left sidebar contains navigation links: Project overview, Details, Activity, Releases, Repository, Issues (0), Merge Requests (0), CI / CD, Operations, Analytics, Wiki, Snippets, and Collapse sidebar. The main content area displays a table of files and a README section.

Name	Last commit	Last update
1.Splash Screen.png	Figma UI Images	3 months ago
2.Home Screen.png	Figma UI Images	3 months ago
3. Capture the Book Page.png	Figma UI Images	3 months ago
4.Reading Page Sinhala Text.png	Figma UI Images	3 months ago
5.Navigation.png	Figma UI Images	3 months ago
6.Navigation Instruction.png	Figma UI Images	3 months ago
7.Capture the Image.png	Figma UI Images	3 months ago
8.Describe the Images.png	Figma UI Images	3 months ago
9.Menu Options.png	Figma UI Images	3 months ago
README.md	Create Flutter Project	3 months ago

README.md

Figma UI/UX Designs

URL: <https://www.figma.com/file/UQtgAPt0ikwLHNBw7oe3N/Audio-Sight?type=design&node-id=0-1&t=ZB168p854xOdnj7R-0>



The screenshot shows the GitLab interface for a project named "Mobile Base Sinhala Book Reader for Visually Impaired Individuals". The left sidebar contains navigation links: Project overview, Details, Activity, Releases, Repository, Issues (0), Merge Requests (0), CI / CD, Operations, Analytics, Wiki, Snippets, and Collapse sidebar. The main content area displays a commit titled "Create dot wave design animation" by Jayathunga T.M. authored 5 days ago. Below the commit, a table lists the files and folders included in the commit.

Name	Last commit	Last update
-		
.vscode	Create Splash Screen	3 months ago
android	update manifest file and update main dart file	6 days ago
assets	add primary voice instructions & update gradle sdk	6 days ago
ios	Create Flutter Project	3 months ago
lib	Create dot wave design animation	5 days ago
linux	Create Flutter Project	3 months ago
macos	update home screen and the dependencies	5 days ago
test	Create Flutter Project	3 months ago
web	Create Flutter Project	3 months ago
windows	Create Flutter Project	3 months ago
.gitignore	Create Flutter Project	3 months ago
metadata	Create Flutter Project	3 months ago



The screenshot shows the GitLab Projects page. The top navigation bar includes the GitLab logo, "Projects", "Groups", "More", and a search bar. Below the navigation bar, there is a "New project" button. The main content area displays a list of projects under the heading "Your projects". The first project listed is "23-198 / Mobile Base Sinhala Book Reader for Visually Impaired Individuals" by Jayathunga T.M. - IT20146238. The project has 1 star, 0 forks, 0 issues, and 0 discussions. It was updated 1 hour ago.

• Getting help from extra resources .

What is Machine Learning? | How It Works & Tutorials
Machine learning, explained | MIT Sloan
What is Machine Learning: Definition and Examples | Built In
What is Machine Learning? - GeeksforGeeks
What is Machine Learning? Definition, Types, and Examples.

Related searches for ai machine learning
artificial intelligence versus...
difference between artificial...
what is ai for dummies
ai and machine learning explained
More related searches

Machine learning has become very common in **artificial intelligence**. Here, programmers teach computers how they can learn to solve problems by themselves instead of teaching them how to solve problems.

The need for machine learning is **increasing day by day**. The reason behind the need for machine learning is that it is capable of doing tasks that are too complex for a person to implement directly.

Amazon Web Services (AWS) offers ML training and certification with four paths: developer, business decision maker, data scientist and data platform engineer. Best of all, they're free.

Image: en.wikipedia.org Data: Wikipedia social.co javatoint.com roberthalf.com
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Feedback

Explore more
Artificial intelligence Python Deep learning Supervised learning Big data

What is machine learning & how does it work?
What is machine learning? What is machine learning? Machine learning is a branch of artificial intelligence (AI) and computer science which focuses

What is artificial intelligence (AI)?
It was defined in the 1950s by AI pioneer Arthur Samuel as "the field of study that gives computers the ability to learn without explicitly being

How in machin
Accordi
Learnin
Rack
compar

```
python
Copy code

from jiwer import wer

# Assuming you have a list of ground truth labels and a list of predicted labels
ground_truth = test_df['caption'].tolist() # Ground truth labels from your dataset
predicted_labels = [] # A list of predicted labels from your model

# Iterate over your test dataset and use your model for predictions
for idx, row in test_df.iterrows():
    img_path = f"data/ocr/images/{row['ImageName']}"
    predicted_text = detect_sinhala_text(img_path) # Modify this to use your model
    predicted_labels.append(predicted_text.lower())

# Calculate Word Error Rate (WER)
wer_score = wer(ground_truth, predicted_labels)

# Calculate accuracy as 1 - WER
accuracy = 1 - wer_score

# Print the accuracy
print(f'Accuracy: {accuracy * 100:.2f}%')
```

Regenerate

Send a message

Free Research Preview. ChatGPT may produce inaccurate information about people, places, or facts. ChatGPT August 3 Version

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HTML CSS JAVASCRIPT SQL **PYTHON** JAVA PHP HOW TO W3.CSS C C++ C# BOOTSTRAP REACT MYSQL JQUERY EXCEL

Matplotlib Labels
Matplotlib Grid
Matplotlib Subplot
Matplotlib Scatter
Matplotlib Bars
Matplotlib Histograms
Matplotlib Pie Charts

Machine Learning
Getting Started
Mean Median Mode
Standard Deviation
Percentile
Data Distribution
Normal Data Distribution
Scatter Plot
Linear Regression
Polynomial Regression
Multiple Regression
Scale
Train/Test
Decision Tree
Confusion Matrix
Hierarchical Clustering
Logistic Regression

```

y = numpy.random.normal(150, 40, 100) / x

plt.scatter(x, y)
plt.show()

```

Result:

The x axis represents the number of minutes before making a purchase.

The y axis represents the amount of money spent on the purchase.

Waiting for www.google.com...

- Submitting the status document 2 .



- Making the PP2 presentation .

1

**Text-to-Speech
(TTS) Synthesizer**



2

**Optical Character
Recognition(OCR)**



3

**Object Detection &
Voice Navigation**



4

Image Detection



4

Image Detection

- Submitting the final individual and group thesis .

**Mobile Base Sinhala Book Reader for Visually
Impaired Individuals**

Project ID:23-198

BhagyaH.D.M

IT20254520

BSc (Hons) in Information Technology

Specializing in Information Technology

Department of Information Technology

Sri Lanka Institute of Information Technology

Sri Lanka



- Research paper acceptance and completing research paper .

Mobile Base Sinhala Book Reader For Visually Impaired Students

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Abstract—The project aims to improve the reading experience and skills of visually impaired students in Sri Lanka by creating a mobile application that allows them to easily read printed books and stationery in Sinhala. The mobile application uses optical character recognition (OCR) technology and voice navigation, incorporating text-to-speech features of the event synthesis framework. The application accurately captures characters on a page of a Sinhala book and distinguishes them using OCR technology, enabling visually impaired people to convert text into accessible digital formats. The extracted text is then made audible via text-to-speech. Sinhala Voice Navigation support is provided for users to navigate the app, get feedback from the user, and identify objects in the surrounding room. The application uses image recognition and description algorithms to describe pictures in Sinhala, helping visually impaired children understand the visual content and improve their reading skills. The platform also offers features to adjust reading speed and choose between male or female voices.

Keywords—Visually Impaired Individuals, Sinhala Text-to-Speech(TTS), Sinhala Optical Character Recognize(OCR), Sinhala Voice Navigation, Image Recognition, Sinhala Object Detection

I. INTRODUCTION

Knowledge is the most important factor for surviving in this century. One way to gain knowledge is through reading, even for those who are visually impaired, who can use the braille system [1]. However, traditional braille systems are becoming outdated as computer-assisted braille systems and text-to-speech systems are becoming more common. Unfortunately, these technologies are not widely available in Sinhala, and these devices are too expensive for the average Sri Lankan. An Android-based solution using OCR, TTS, image recognition, and voice navigation was considered for this study to improve the reading experience and accessibility for the visually impaired "Sinhala Book Reader Mobile Application".

The quality of a Text-to-Speech (TTS) system depends on its ability to imitate human speech and ensure clear understanding. The absence of natural expressions in TTS

output has a substantial influence on application usability. This emphasizes a key issue in TTS development for creating a synthesized speech [2] that closely matches the human voice from the text. TTS technology's major goal is to recreate the complete range of human speech, including different speech patterns, subtleties, and intonations, while reducing the mechanical or robotic quality of the output voice.

The Sinhala language, the mother tongue of most Sri Lankans, is a crucial area for TTS development due to its complexities and nuances. Despite the large number of Sinhala speakers in Sri Lanka, there is a need for research on Sinhala voice recognition. The complexities of the Sinhala language make it difficult for computers to understand and reproduce it. Currently, there is little progress in developing TTS systems for the Sinhala language. However, this is a key research frontier that must be explored. An efficient TTS system for Sinhala would bridge the gap between human language skills and machine-generated speech [1], improving user experiences and bridging the gap between human language skills and machine-generated speech. There have been only a few attempts made to develop a Sinhala language TTS. This is still a major research area that requires investigation, which is one of the key motivations for this research.

In an increasingly digitized world, accessibility to information and literature remains a challenge for visually impaired individuals. Mobile technology and Optical Character Recognition (OCR) can solve this issue. This introduction elucidates the significance of mobile-based Sinhala book readers employing OCR technology as a transformative solution for individuals with visual impairments. By harnessing the power of mobile devices and OCR, these readers offer the potential to convert printed Sinhala text into accessible digital formats, thereby facilitating independent and inclusive access to literature for visually impaired individuals. This section introduces the key components of this paper, including the integration of OCR technology, the unique context of the Sinhala language, and the overarching goal of enhancing accessibility and enriching the reading experiences of visually impaired individuals [3].

Our Sinhala book reader app for blind users delivers a ground-breaking feature: picture detection within Sinhala children's books, at the nexus of accessibility and education. By allowing those who are blind to enjoy the rich world of

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Compose

Inbox 5/325

Starred

Snoozed

Sent

More

Labels +

Fwd: Acceptance Notification: 5th International Conference on Advancements in Computing

Thirosh Madhusha
To me

Sun, 15 Oct, 11:27

Forwarded message

From: Microsoft CMT <email@microsoft.com>
Date: Sat, 14 Oct 2023, 22:40
Subject: Acceptance Notification: 5th International Conference on Advancements in Computing
To: Thirosh M Jayathunga <thiroshmadhusaha052@gmail.com>

Dear Thirosh M Jayathunga,

Congratulations! We are pleased to inform you that your paper has been accepted to be presented at the 5th International Conference on Advancements in Computing.

Paper ID: 481
Paper Title: Mobile Base Sinhala Book Reader For Visually Impaired Students

Please visit <https://cmt3.research.microsoft.com/ICAC/2023/Submission/Index> to view the reviews given during the double-blind review process.

When preparing the camera-ready version of your paper, please address all the review comments and follow the camera-ready guidelines given in the <https://icac.lk/for-authors>.

Please note that the camera-ready deadline is 1st of November 2023.

Camera-ready Submission Guidelines for Authors:
(also available at <https://icac.lk/for-authors>)

.....

1. Check the review comments in the CMT. The authors are expected to address all reviewer comments and revise the paper accordingly. (NOTE: You are not allowed to make significant structural changes to the accepted article.)

2. The paper must comply with IEEE format in order to be published in IEEE Xplore.

3. The title, author names, and affiliations must be in the correct format.
(refer https://ieeauthorcenter.ieee.org/wp-content/uploads/IEEE_Style_Manual.pdf)

4. The abstract should be limited to 150-200 words.

5. All references and citations must be in IEEE referencing style.
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- Creating the poster



AudioSight

AudioSight

A MOBILE APPLICATION TO HELP VISUALLY IMPAIRED CHILDREN FOR READING BOOKS

Supervisor - Prof. Koliya Pulasinghe
Co-supervisor -Ms. Poorna Panduwawala

ABSTRACT

In today's world, where technology like computers, smartphones, and artificial intelligence is integral to people's daily activities, visually impaired children face several challenges accessing printed text materials. Therefore, there is a necessity to enhance devices that can help alleviate the difficulties that blind people face. "Audio Sight" is a mobile application based on the Android platform that includes essential features like Optical Character Recognition (OCR), Text-to-Speech (TTS) Synthesizer, image conversion into Sinhala text, and Voice Navigation and object identification. Our system uses the Transformer Model. This VisionImageRecognizerClient has a 93% accuracy rate for Optical Character Recognition (OCR). Additionally, we have the SpeechTTSForTextToSpeech model, which has a 97% accuracy rate for Text-to-speech (TTS). The VisionEncoderDecoder model has a 95% accuracy rate for image detection, and the DetForObjectDetection model has a 95.5% accuracy rate for Object detection. The "Audio Sight" android app acts as an artificial eye for visually impaired children, producing superior results without the need for supervision.

INTRODUCTION

Traditional braille systems are becoming outdated, and computer-assisted braille and text-to-speech systems are becoming more common. However, these technologies are not widely available in Sinhala and are expensive for the average Sri Lankan. To address this, an Android-based solution called the "Sinhala Book Reader Mobile Application" was developed, utilizing OCR, TTS, image recognition, and voice navigation to improve reading experience and accessibility.

In today's digital world, people with visual impairments face challenges in accessing information and literature. However, the use of mobile technology and Optical Character Recognition (OCR) can help solve this issue. By utilizing mobile devices and OCR, these readers can convert printed Sinhala text into accessible digital formats, enabling visually impaired individuals to have independent and inclusive access to literature. This article discusses the integration of OCR technology in improving accessibility and enhancing the reading experiences of individuals with visual impairments in the Sinhala language.

This innovative approach not only promotes educational inclusion but also demonstrates our commitment to providing every child with the resources for comprehensive learning and personal growth through technology.

RESEARCH PROBLEM

The research problem addressed by this study is therefore twofold: first, the lack of accessible reading materials in the Sinhala language, and second, the lack of accessible technologies and applications designed specifically for Sinhala-speaking child individuals who are blind or visually impaired. By developing a Sinhala book reader app for blind children, this study aims to address both of these challenges and provide a more accessible and inclusive reading experience for individuals with visual impairments in Sri Lanka. To the best of our knowledge, there is currently no existing technology or application designed specifically for blind or visually impaired Sinhala-speaking individuals. While there are some existing assistive technologies and applications for visually impaired individuals in other languages, such as English, these are often not compatible with the Sinhala language due to differences in syntax and grammar. As a result, there is a significant gap in the market for accessible reading technologies for Sinhala-speaking blind individuals.

RESULTS AND DISCUSSION

This app is designed for blind Sinhala readers and offers a range of helpful features, such as OCR, TTS synthesis, object recognition and navigation, and picture detection. The OCR feature has been successful in accurately extracting Sinhala text from printed images with a 93% accuracy rate. Users have been highly satisfied with the TTS synthesis system, which has a 97% customer satisfaction rate and can convert extracted Sinhala text into realistic sounds. The image detection component has improved the app's ability to accurately describe images, achieving a 95% accuracy rate while identifying images from Sinhala storybooks. The Object Detection component has a real-world context-adaptive capability with an accuracy rate of 95.5%, delivering accurate descriptions of items. The navigation system efficiently directs users using haptic feedback and aural cues. This amazing resource allows individuals to easily access and comprehend written content, making it an invaluable tool for anyone seeking to improve their reading capabilities.

CONCLUSIONS

To summarize, this research aims to improve the availability and accessibility of literature for people with visual impairments. The Sinhala Book Reader App is a prime example of how creativity and community involvement can solve the unique challenges faced by this group. This study worked closely with visually impaired individuals and technology experts to create a tailored solution that addresses their specific needs. Utilizing advanced technologies including OCR, TTS, voice navigation, object detection, and picture recognition, a comprehensive approach was created to enhance the reading experience while ensuring user safety.

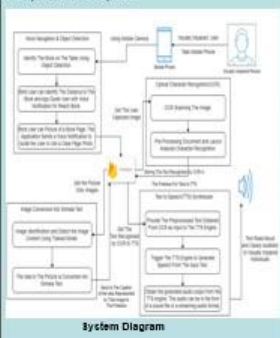
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METHODOLOGY

The aim of this research is to create a Sinhala book reader for visually impaired children that utilizes mobile technology. The development process involves a comprehensive analysis of user needs in collaboration with visually impaired youngsters and assistive technology experts. The process includes the incorporation of OCR technology that can effectively recognize the nuances of the Sinhala script, the creation of a user-friendly interface with tactile and auditory feedback, and the implementation of a text-to-speech synthesis that accurately vocalizes digitized Sinhala text. The main functions we have addressed here are:

1. Sinhala Optical Character Recognition (OCR) System.
2. Sinhala Text-to-Speech (TTS) System.
3. Sinhala Voice Navigation System.
4. Object Detection System.



OBJECTIVES

The primary purpose of creating a Sinhala book reader for visually impaired individuals is to enable them to access literature in their mother tongue. This initiative aims to improve their literacy and promote their integration into society. Four main sub objectives of our research are:

1. Optical Character Recognition (OCR)
2. Text-to-Speech (TTS) Synthesizer
3. Object Detection & Voice Navigation
4. Image Detection

