Multi-Model Approach to Recommend Personalized Music Playlist

TMP – 2023 – 24 - 065

Status Document – 1

Sumanasekara H. P. – IT20665616

Supervised by – Mr. Thusithanjana Thilakarathne

B.Sc. (Hons) Degree in Information Technology

Department of Software Engineering

Sri Lanka Institute of Information Technology

Sri Lanka

December 2023

Table of content

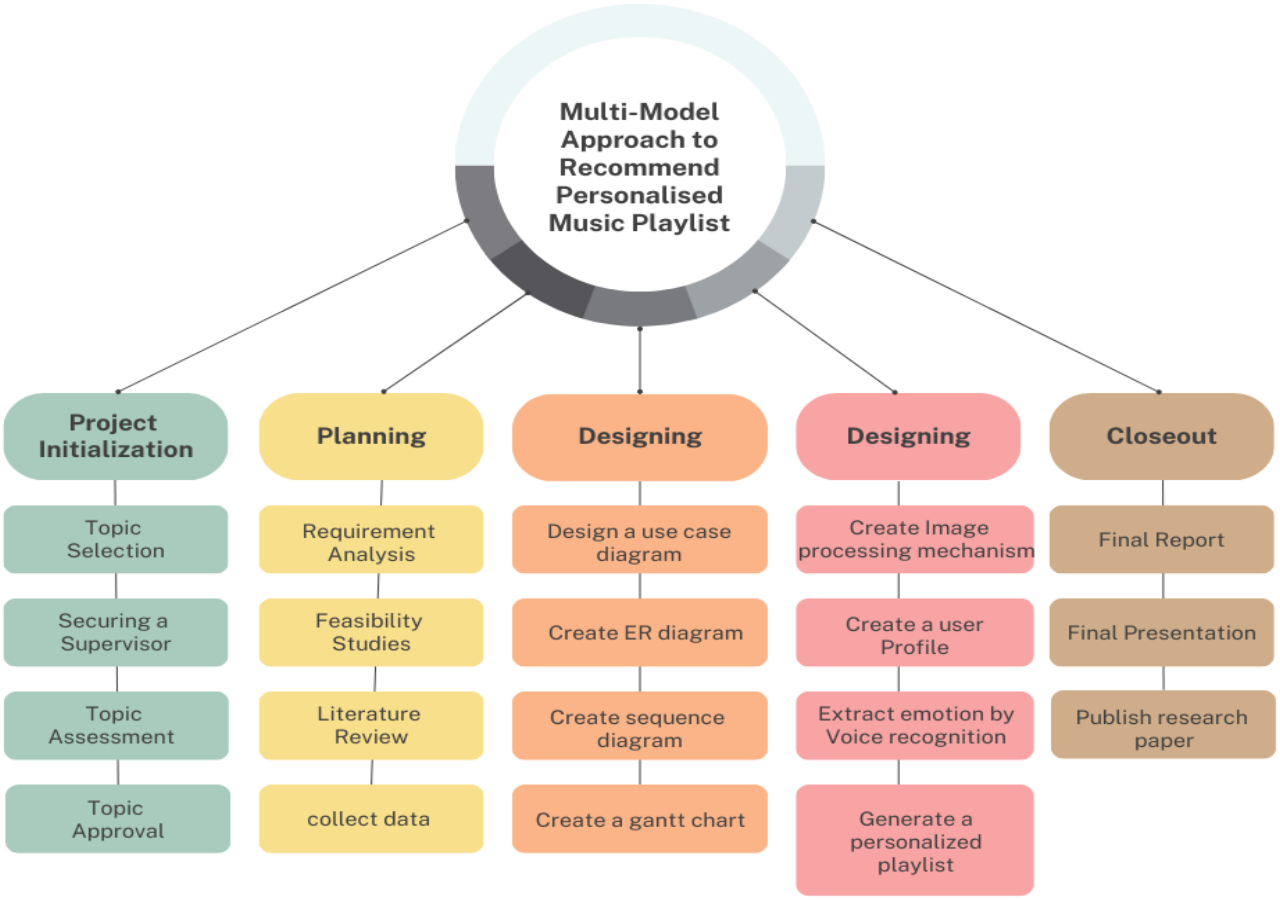
Table of Contents

Introduction

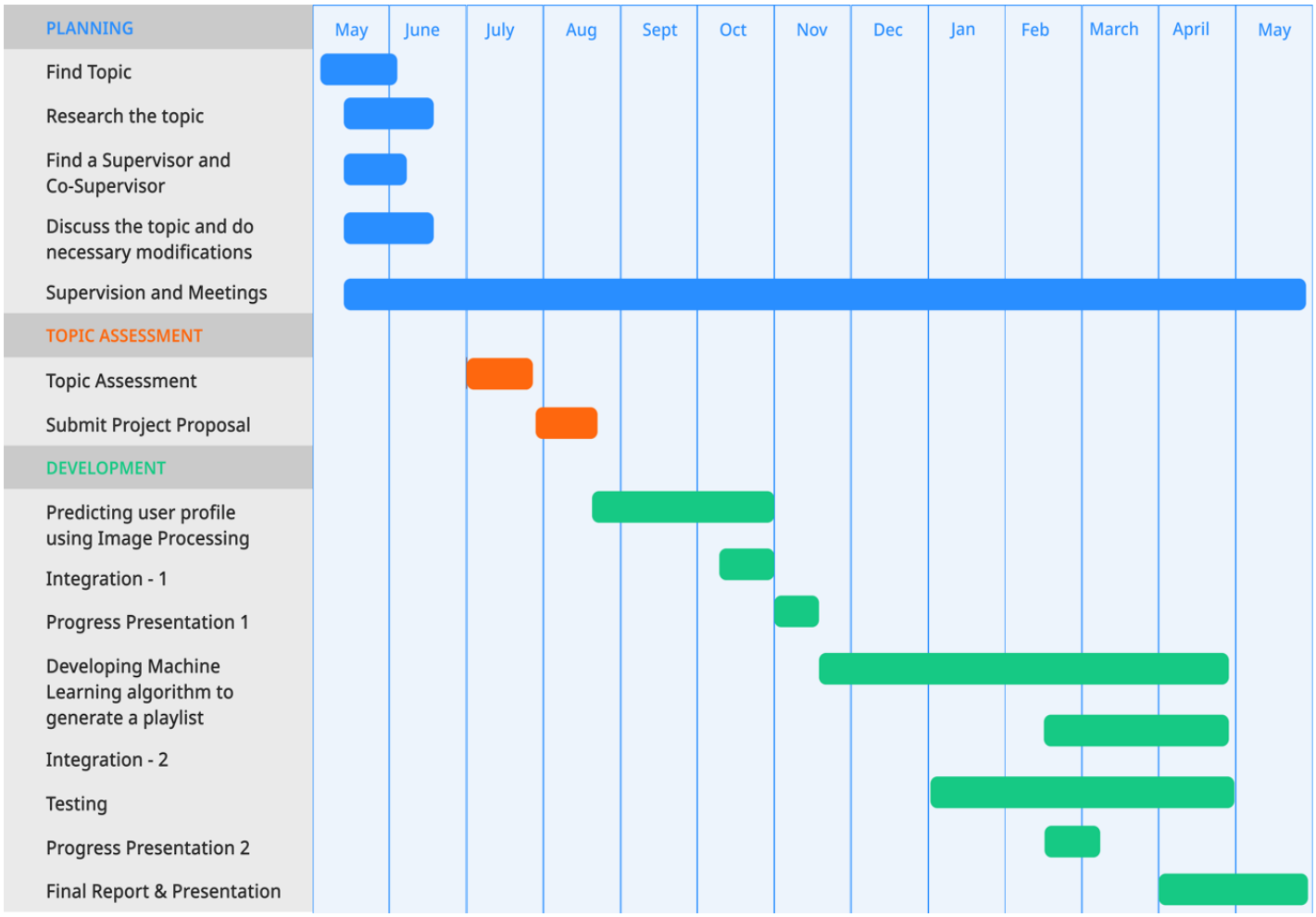
Music recommender systems play a crucial role in assisting users to discover new music that aligns with their preferences, enhancing their overall music consumption experiences. The end goal of our research is to implement a new system to provide a personalized music experience to the user. As we have conducted a survey, we have found that the Age group and the Gender of the music listener is impacting to the music recommendation. Therefore, my contribution to the recommender system is to identify and analyze user profile based on a selfie image to overcome the main problems in existing music applications, which are cold start problem, lengthy forms to fill when signing up to the system by introducing an innovative approach. I have implemented a convolutional neural network (CNN)-based facial image classification model. This model will harness deep learning technologies to accurately discern users' age and gender through their facial features. Integrating this facial image classification model with our music recommendation system will create a unified mobile application.

This document is prepared to showcase the status of the project along with the proofs with screenshots of the teamwork within the group.

Work Breakdown Chart



Gantt Chart


PLANNING
Find Topic
Research the topic
Find a Supervisor and Co-Supervisor
Discuss the topic and do necessary modifications
Supervision and Meetings
TOPIC ASSESSMENT
Topic Assessment
Submit Project Proposal
DEVELOPMENT
Predicting user profile using Image Processing
Integration - 1
Progress Presentation 1
Developing Machine Learning algorithm to generate a playlist
Integration - 2
Testing
Progress Presentation 2
Final Report & Presentation
May
June
July
Aug
Sept
Oct
Nov
Dec
Jan
Feb
March
April
May

Finding Supervisors and Selecting the research topic

Requesting an Appointment for Research Topics Discussion Inbox ×

it20665616 Sumanasekara H. P. <it20665616@my.sliit.lk> Jun 5, 2023, 2:42 PM
to dharshana.k

Dear Sir,

I hope this email finds you well. My name is Hansi, and I am reaching out to request a meeting with you regarding my research project.

I kindly request an appointment tomorrow morning to discuss the topic of my project with you. I believe your expertise and guidance would be invaluable in shaping my research direction. Your valuable insights would contribute significantly to the success of my project.

I understand that your time is precious, and I genuinely appreciate any opportunity you can spare to meet with me. Please let me know if there is a convenient time for you, and I will gladly adjust my schedule accordingly.

I have attached a brief summary of what we have in mind as the research topics.

Thank you for your attention, and I look forward to the possibility of meeting with you.

Yours sincerely,
Hansi

One attachment • Scanned by Gmail

PDF Discussion for Re...

Requesting for the supervision for final year research Inbox ×

it20665616 Sumanasekara H. P. Tue, Jun 6, 2023, 8:30 PM
Dear Sir, I hope this email finds you in good health and high spirits. My name is Hansi, and I am writing to respectfully request your consideration in becoming

Thusithanjana Thilakarthna Wed, Jun 7, 2023, 5:42 PM
Dear student, I am available tomorrow. can we have a meeting after 10 AM? Thank you! Best regards, [cid:424fba11-ef19-4063-ad2d-e1a33bfa6c05] <https://www.sliit

it20665616 Sumanasekara H. P. Wed, Jun 7, 2023, 10:17 PM
Sure sir. Are you available on Teams ? or physically sir ?

Thusithanjana Thilakarthna <thusithanjana.t@sliit.lk> Thu, Jun 8, 2023, 9:25 AM
to me

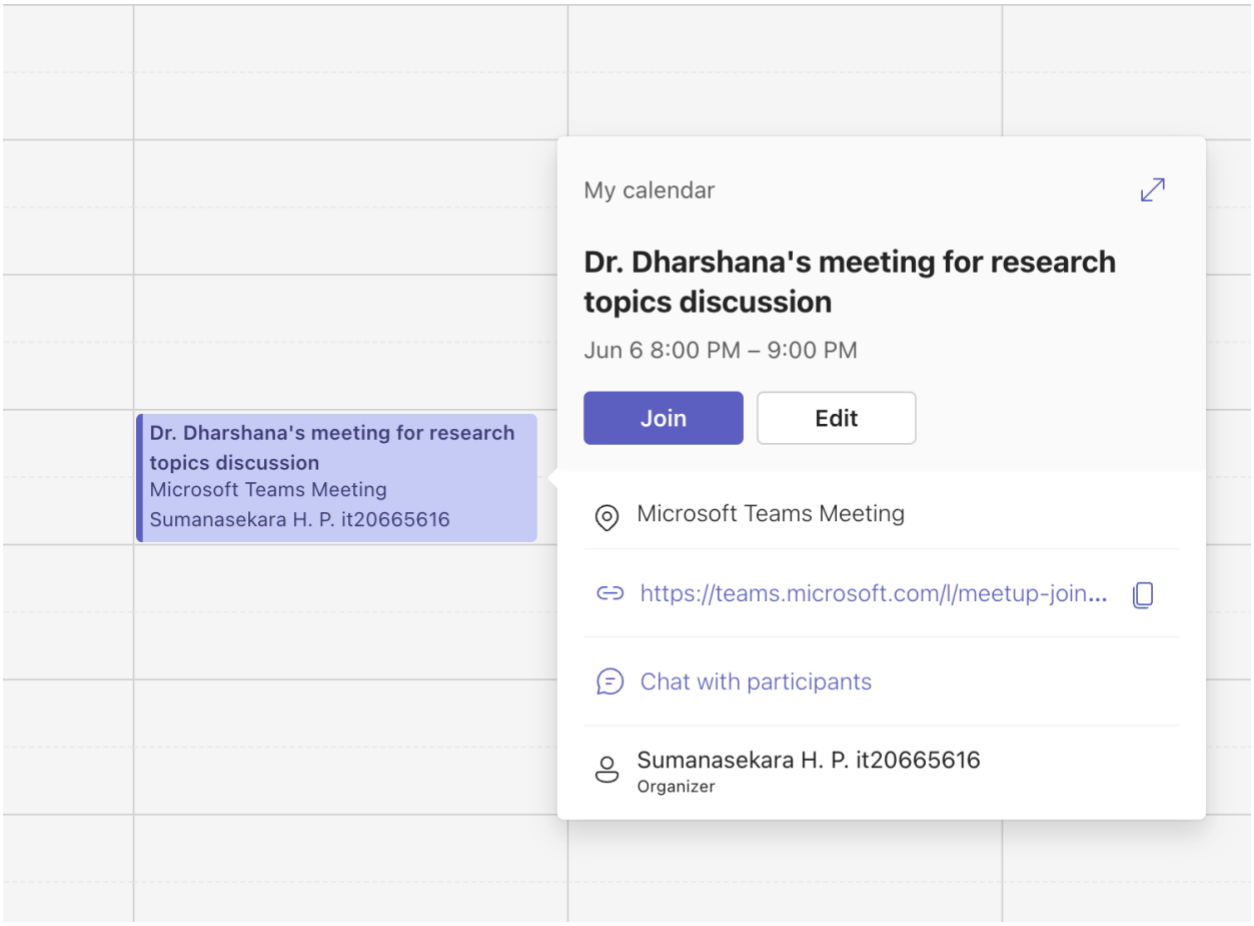
I can come to the campus around 11

Get Outlook for iOS<https://aka.ms/o0ukef>

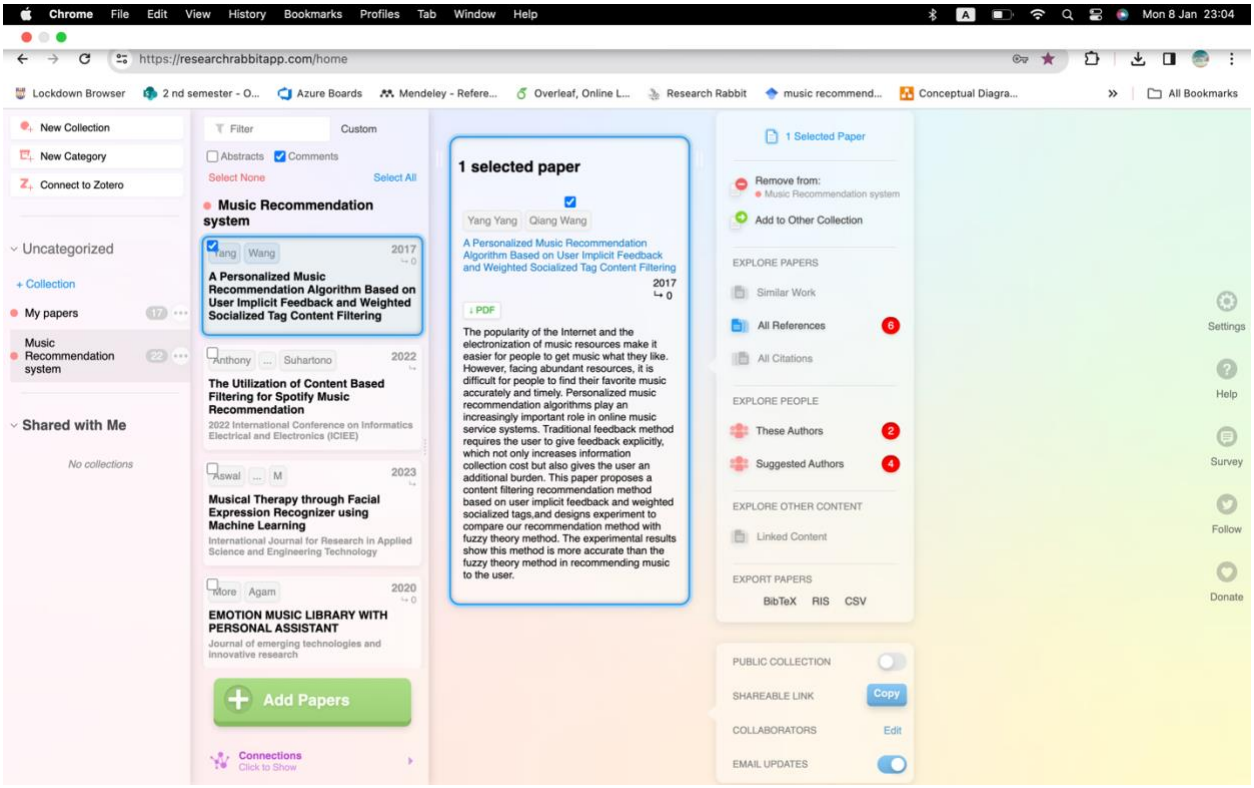
From: it20665616 Sumanasekara H. P. <it20665616@my.sliit.lk>
Sent: Wednesday, June 7, 2023 10:17:12 PM
To: Thusithanjana Thilakarthna <thusithanjana.t@sliit.lk>
Subject: Re: Requesting for the supervision for final year research

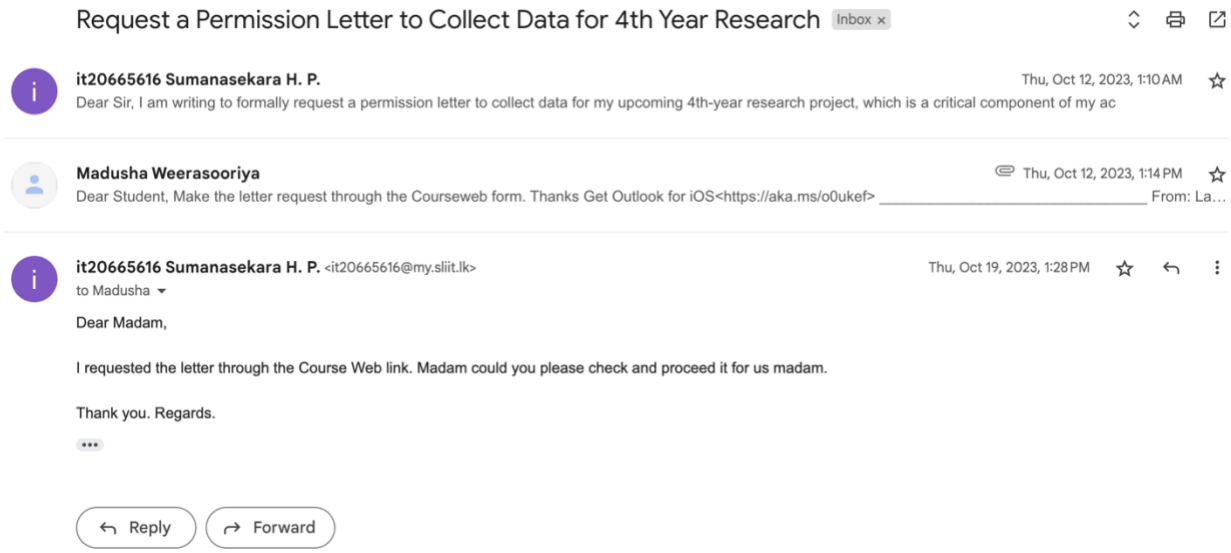
[EXTERNAL EMAIL] This email has been received from an external source – please review before actioning, clicking on links, or opening attachments.
Sure sir. Are you available on Teams ? or physically sir ?

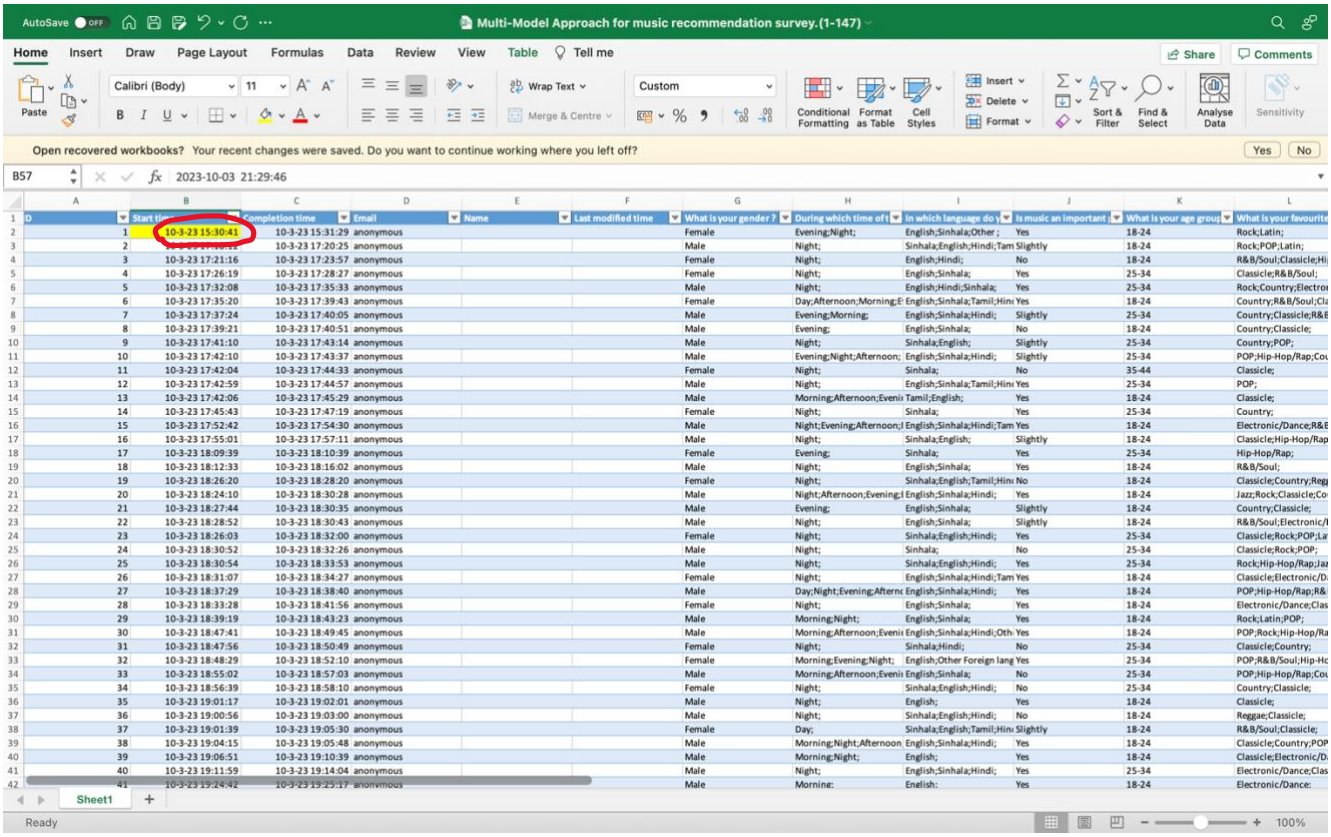
On Wed, Jun 7, 2023 at 5:42 PM Thusithanjana Thilakarthna <thusithanjana.t@sliit.lk<mailto:thusithanjana.t@sliit.lk>> wrote:
Dear student,


Dr. Dharshana's meeting for research topics discussion
Microsoft Teams Meeting
Sumanasekara H. P. it20665616
My calendar
Dr. Dharshana's meeting for research topics discussion
Jun 6 8:00 PM – 9:00 PM
Join
Edit
Microsoft Teams Meeting
https://teams.microsoft.com/l/meetup-join...
Chat with participants
Sumanasekara H. P. it20665616
Organizer

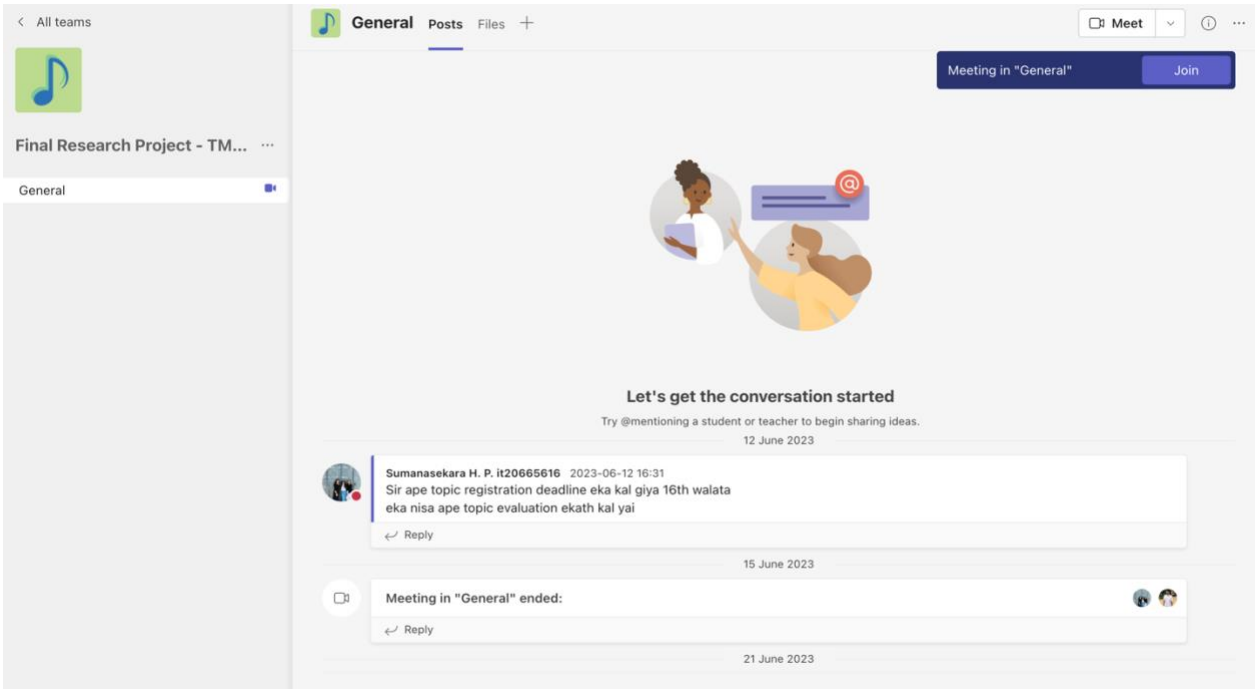
Data Gathering and Research

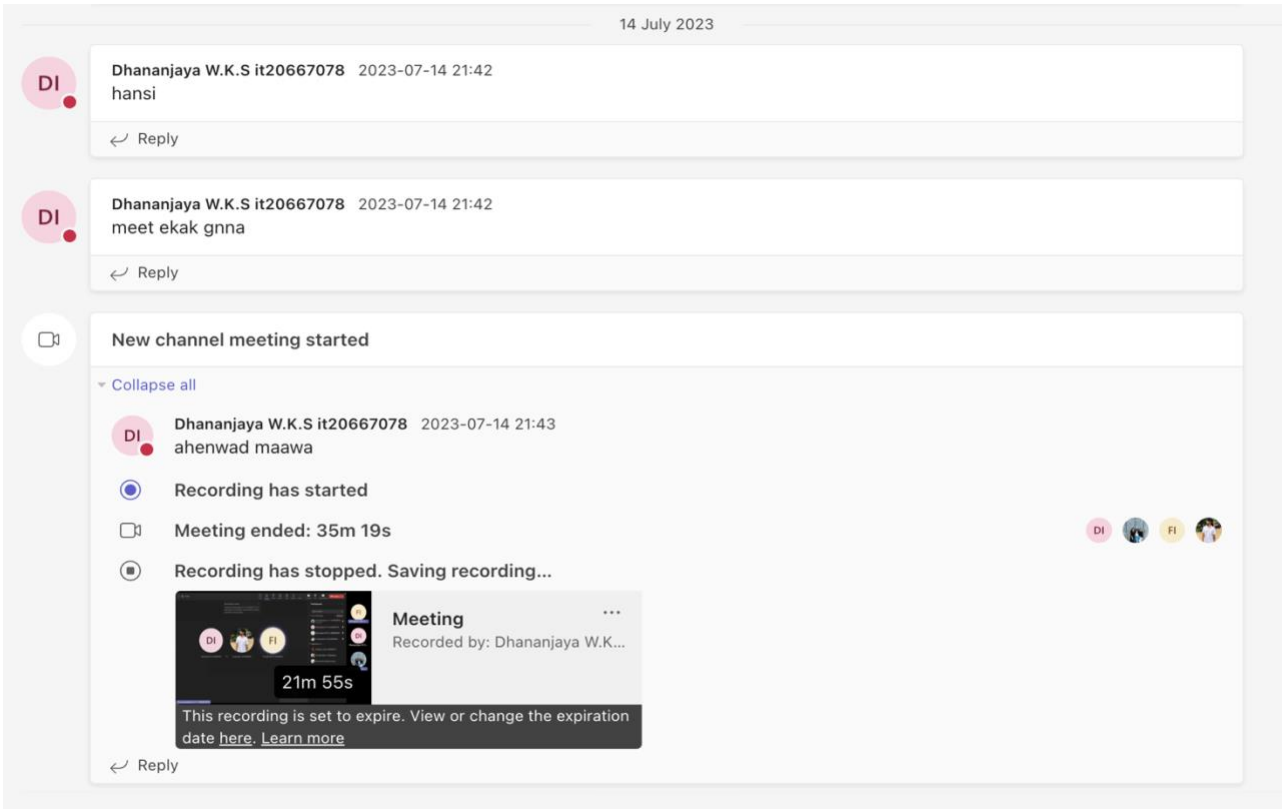





Multi-Model Approach for music recommendation survey.(1-147)
Open recovered workbooks? Your recent changes were saved. Do you want to continue working where you left off?
Yes
No
B57
2023-10-03 21:29:46
Sheet1
Ready

MS Teams Group Creation and continuous meetings





21 June 2023

Meeting in "General" started

Collapse all

Recording has started

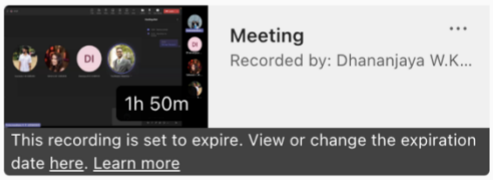
Sumanasekara H. P. it20665616 2023-06-21 20:08
4th year Research

Thusithanjana Thilakarthna 2023-06-21 21:23
We Are Your Friends

Thusithanjana Thilakarthna 2023-06-21 21:41
https://scholar.google.com/citations?view_op=list_works&hl=en&hl=en&user=RCGYhLsAAAAJ

Meeting ended: 1h 53m

Recording has stopped. Saving recording...

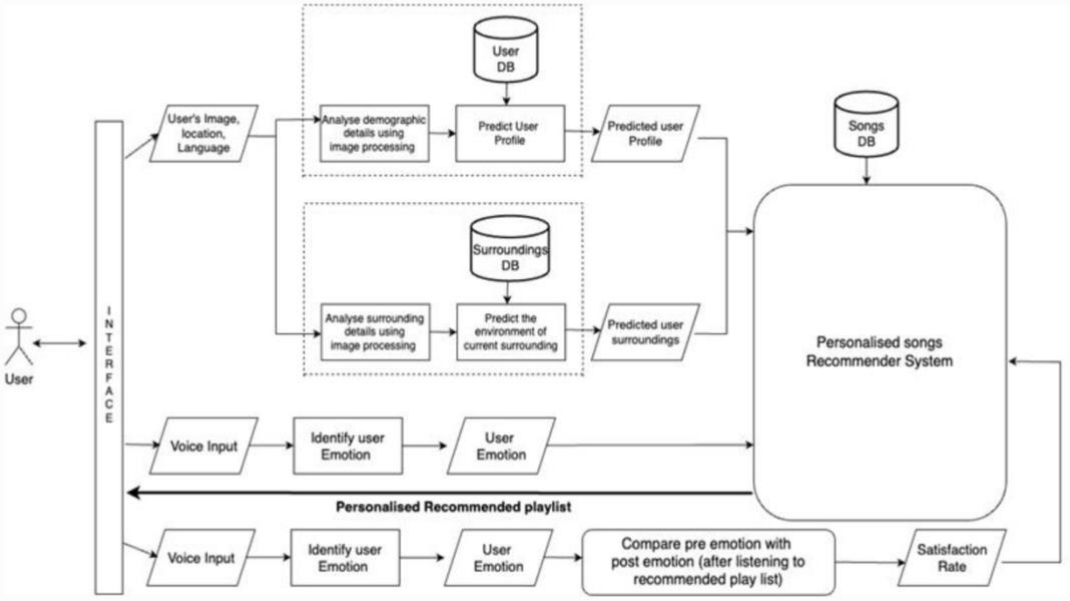


Reply

23 June 2023

Sumanasekara H. P. it20665616 2023-06-22 22:28
Thusithanjana Thilakarthna
Dharshana Kasthurirathna

Sir here is our modified conceptual diagram



27 September 2023

Meeting in "General" started

4 replies from IT20665852

Reply

11 October 2023

Meeting in "General" started

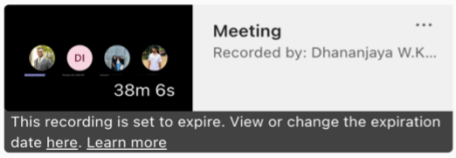
Collapse all

Recording has started

Thusithanjana Thilakarthna 2023-10-11 20:15
http://www.scholarpedia.org/article/Ensemble_learning

Recording has stopped. Saving recording...

Meeting ended: 51m 21s



Reply

28 July 2023

Meeting in "General" ended:

Reply

Meeting in "General" ended:

Meeting ended:

Reply

Meeting now ended:

Reply

30 July 2023

Meeting in "General" ended:

Reply

Meeting in "General" started

Collapse all

Collapse all

Sumanasekara H. P. it20665616 2023-07-30 17:19
search karanna

music recommendation based on surroundings kiyala

othanin select karaganna oyata compare karanna puluwan research thunak hari 4k hari

ita passe research gap eka ganna

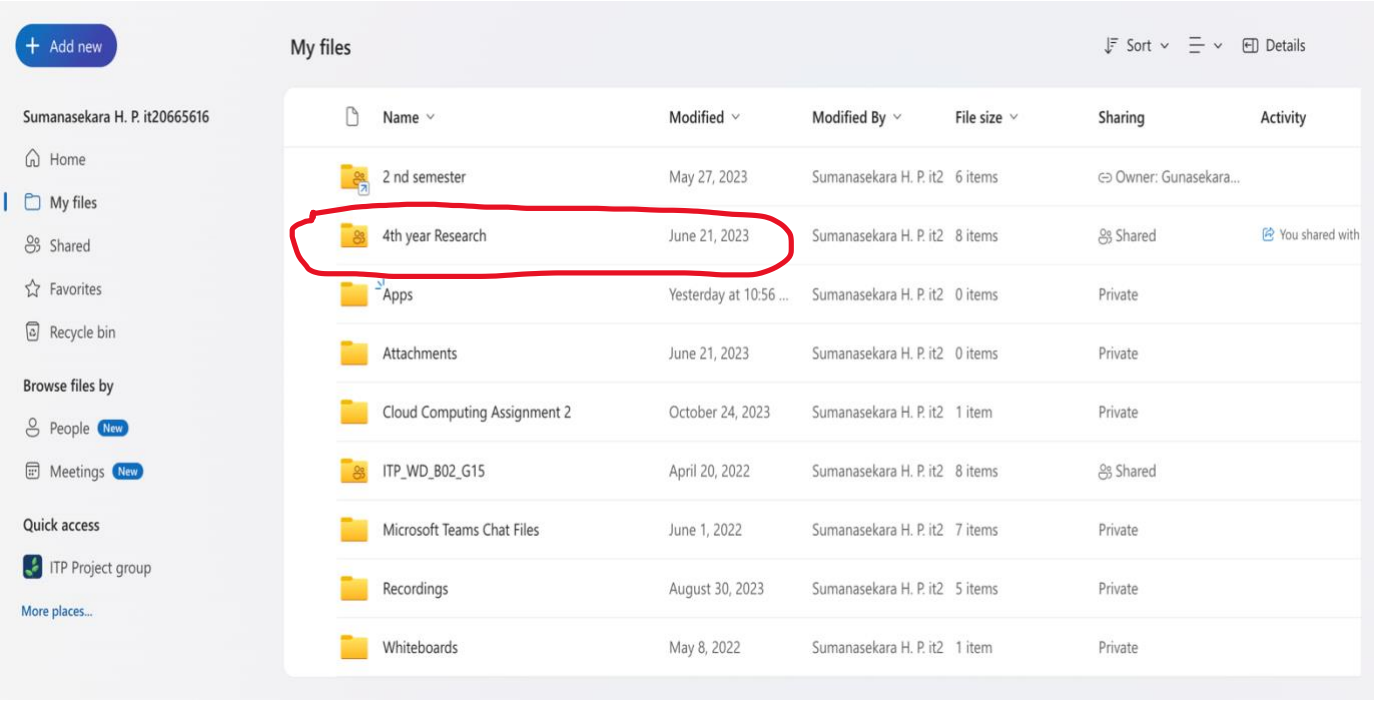
e dekath balanna

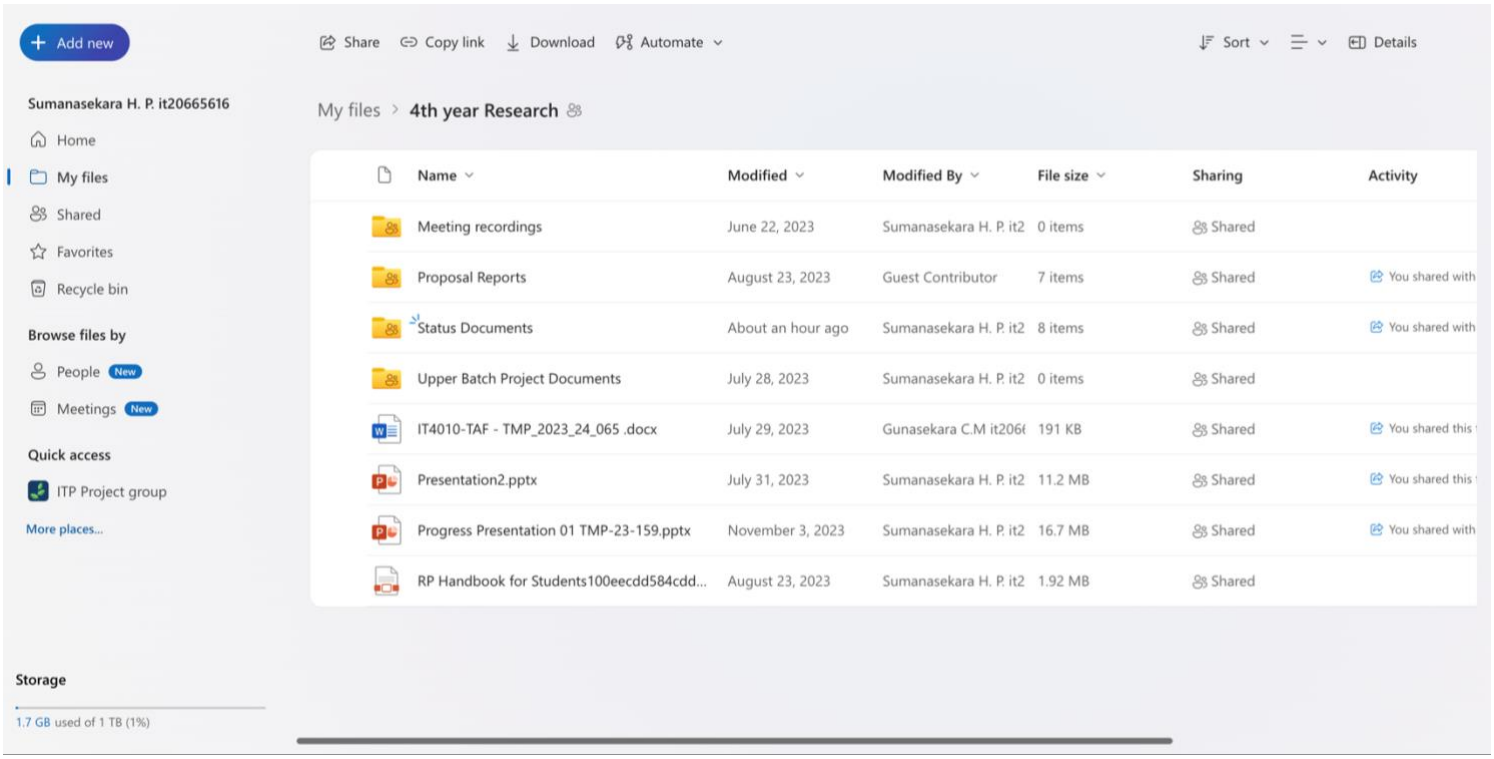
eke nama athi

Meeting ended: 7h 22m

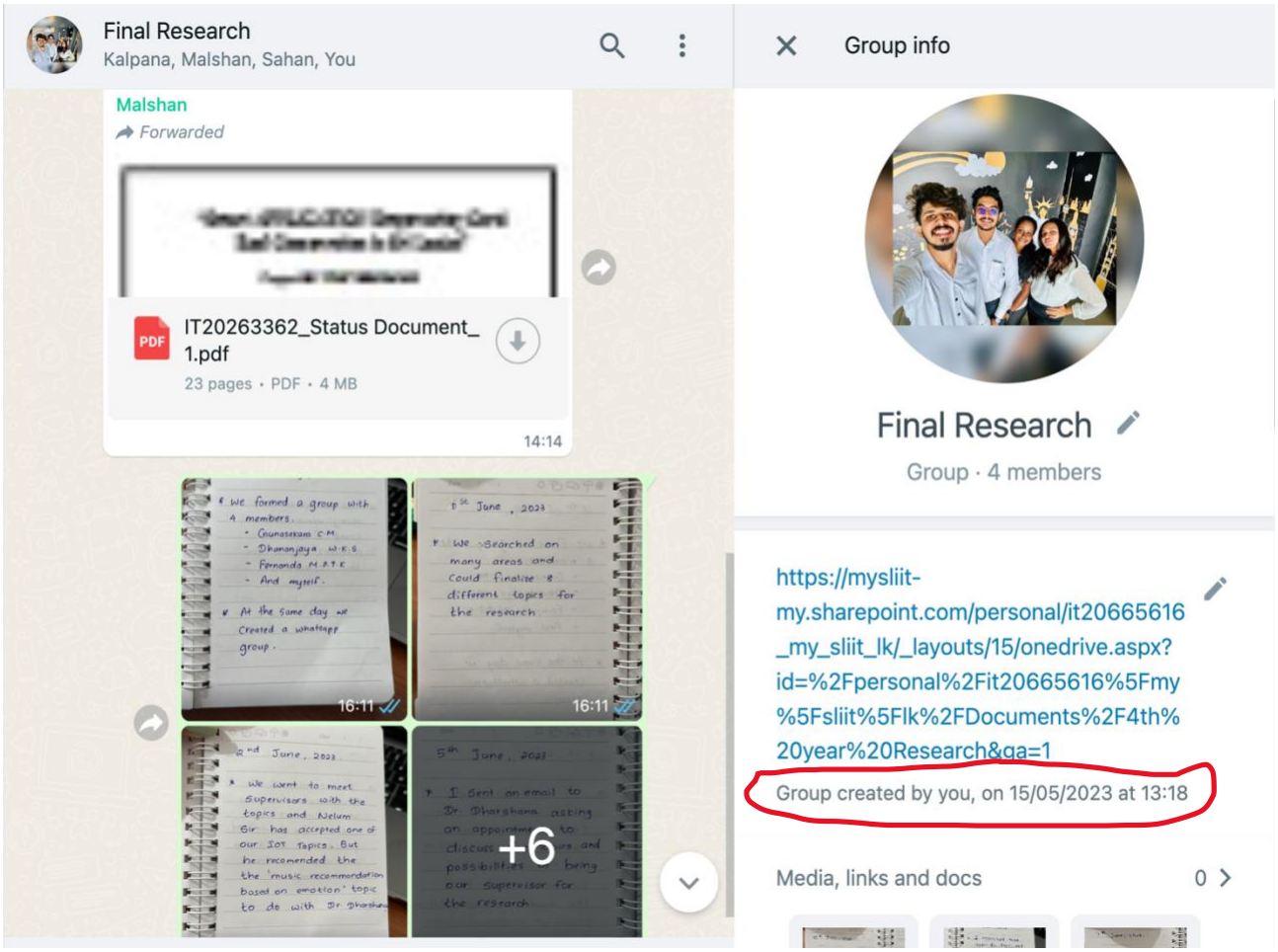
Reply

Maintaining a OneDrive (Cloud) Folder for easy collaboration

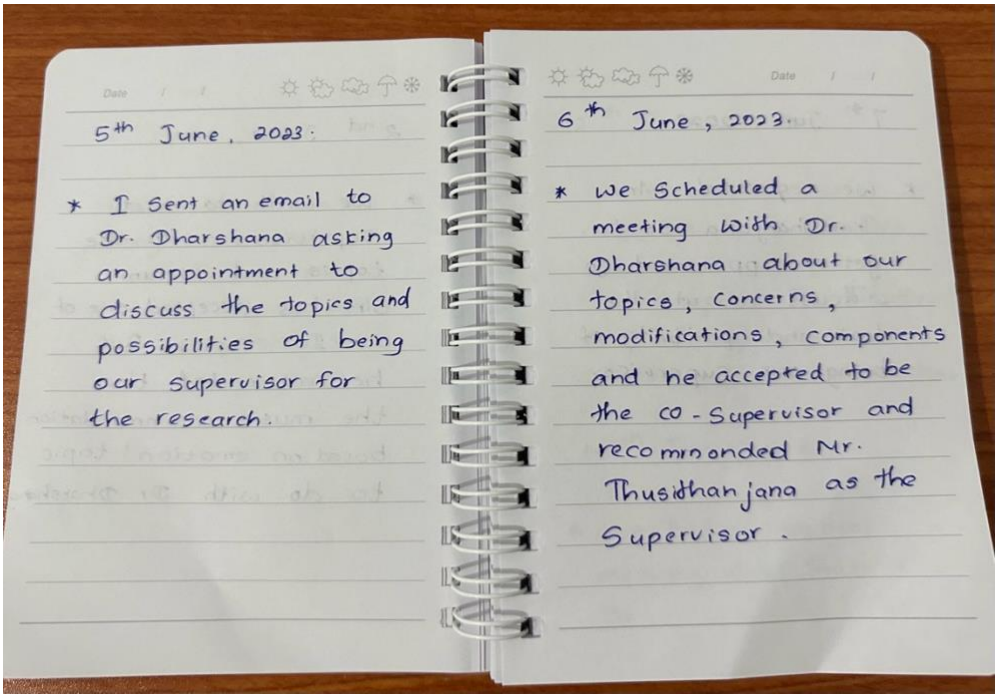




Maintaining a WhatsApp Group for the Team collaboration



Maintaining a logbook

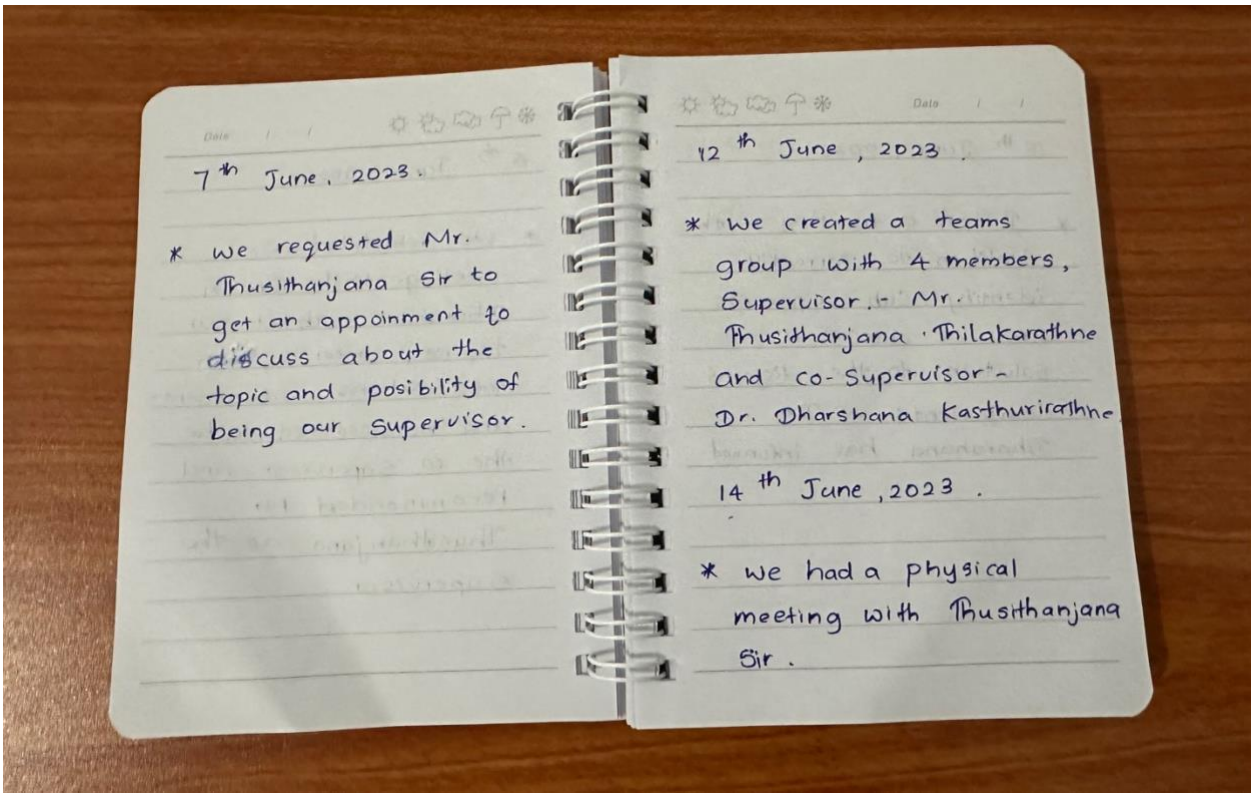


5th June, 2023.

* I sent an email to Dr. Dharshana asking an appointment to discuss the topics and possibilities of being our supervisor for the research.

6th June, 2023.

* we scheduled a meeting with Dr. Dharshana about our topics, concerns, modifications, components and he accepted to be the co-supervisor and recommonded Mr. Thusithanjana as the Supervisor.



7th June, 2023.

* we requested Mr. Thusithanjana Sir to get an appoinment to discuss about the topic and posibility of being our supervisor.

12th June, 2023.

* we created a teams group with 4 members, Supervisor :- Mr. Thusithanjana Thilakarathne and co-supervisor - Dr. Dharshana Kasthurirathne.

14th June, 2023.

* we had a physical meeting with Thusithanjana Sir.

Progress so far….

```
[3]  csv_file = '/content/drive/MyDrive/Age_Dataset/train.csv'
     data = pd.read_csv(csv_file)
```

```
[4]  image_dir='/content/drive/MyDrive/Age_Dataset/Train'
```

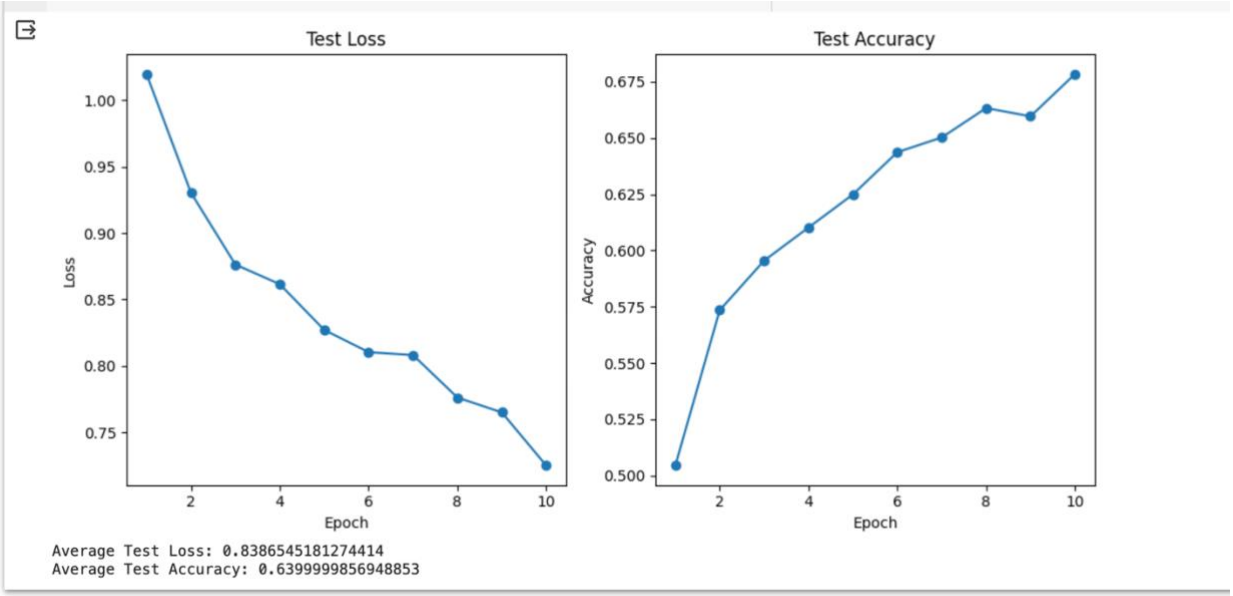
Image preprocessor

```
[5]  X=[]
     Y=[]
```

```
image_count=0
for index, row in data.iterrows():
  if image_count >=3500:
    break;
  # if image_count == 0:
    # continue;
  image_path = os.path.join(image_dir, row['ID'])
  image = load_img(image_path, target_size=(224, 224))
  # Load and resize the image
  image = img_to_array(image) / 255.0  # Normalize pixel values
  X.append(image)
  Y.append(row['Class'])
  image_count+=1
```

Creating CNN model

```
[ ]  from tensorflow.keras.models import Sequential
     from tensorflow.keras.layers import Conv2D, MaxPooling2D, Flatten, Dense, Dropout

     model = Sequential()

     # Convolutional layers
     model.add(Conv2D(32, (3, 3), activation='relu', input_shape=(224, 224, 3)))
     model.add(MaxPooling2D((2, 2)))
     model.add(Conv2D(64, (3, 3), activation='relu'))
     model.add(MaxPooling2D((2, 2)))
     model.add(Conv2D(128, (3, 3), activation='relu'))
     model.add(MaxPooling2D((2, 2)))

     # Flatten the output for fully connected layers
     model.add(Flatten())

     # Fully connected layers
     model.add(Dense(128, activation='relu'))
     model.add(Dropout(0.7))  # Dropout layer to prevent overfitting
     model.add(Dense(3, activation='softmax'))  # 3 output neurons for age categories

     # Compile the model
     model.compile(optimizer='adam', loss='sparse_categorical_crossentropy', metrics=['a
```



Cheking the Age