



Research Project (IT 4010)
4th year

Research Logbook

TeaBot

Tea Plantation Preservation Using an Intelligent Robot

2023-044

IT19973470

Gunawardana I.I.E

In partial fulfillment of the requirements for the
Bachelor of Science Special Honors Degree in Information Technology
Specializing in Software Engineering
30.10.2023

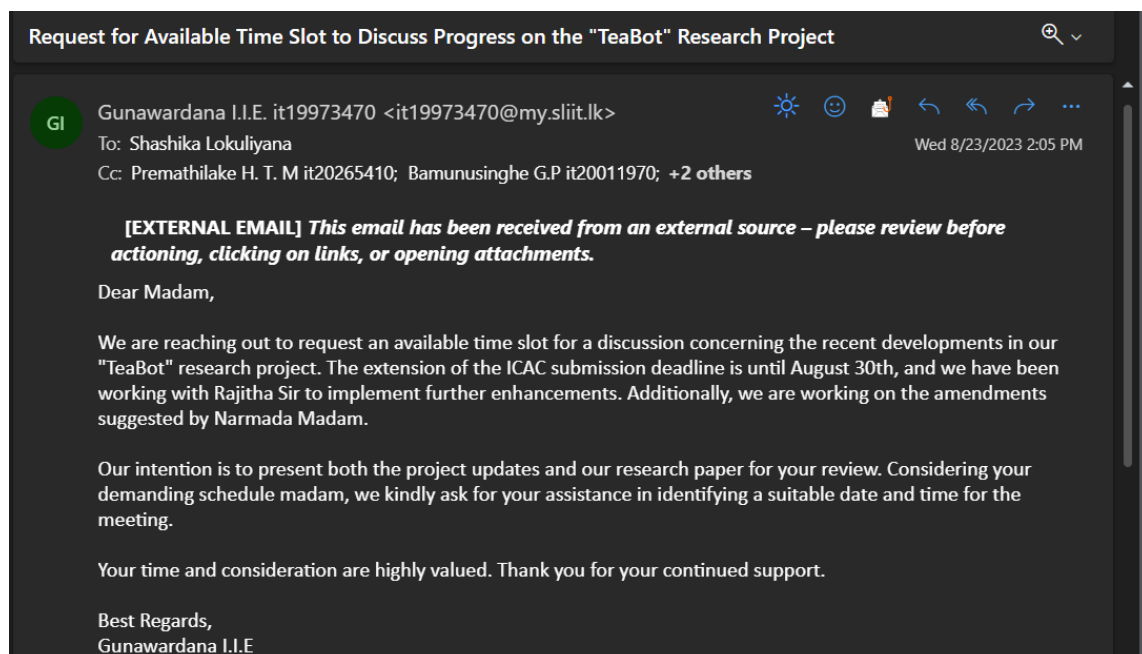
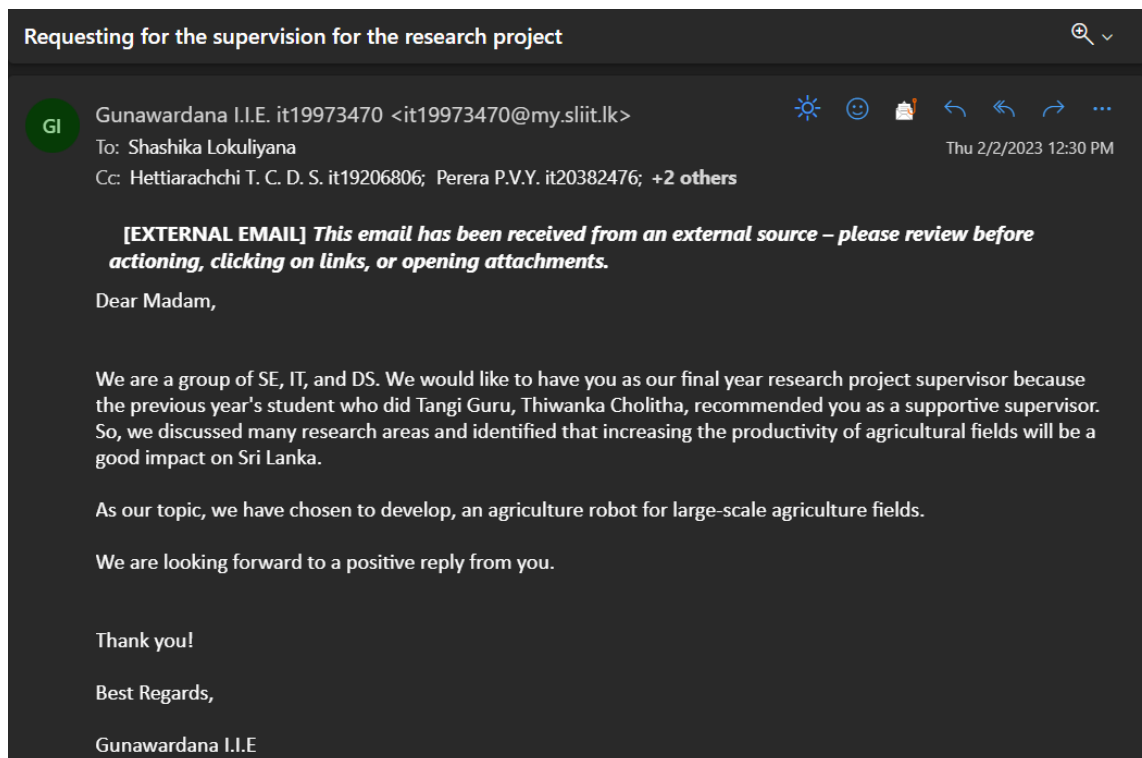
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1 Supervisor, Co-Supervisor, External Supervisor Meetings, Emails, and Messages

1.1 Meetings with Supervisor and co-supervisor



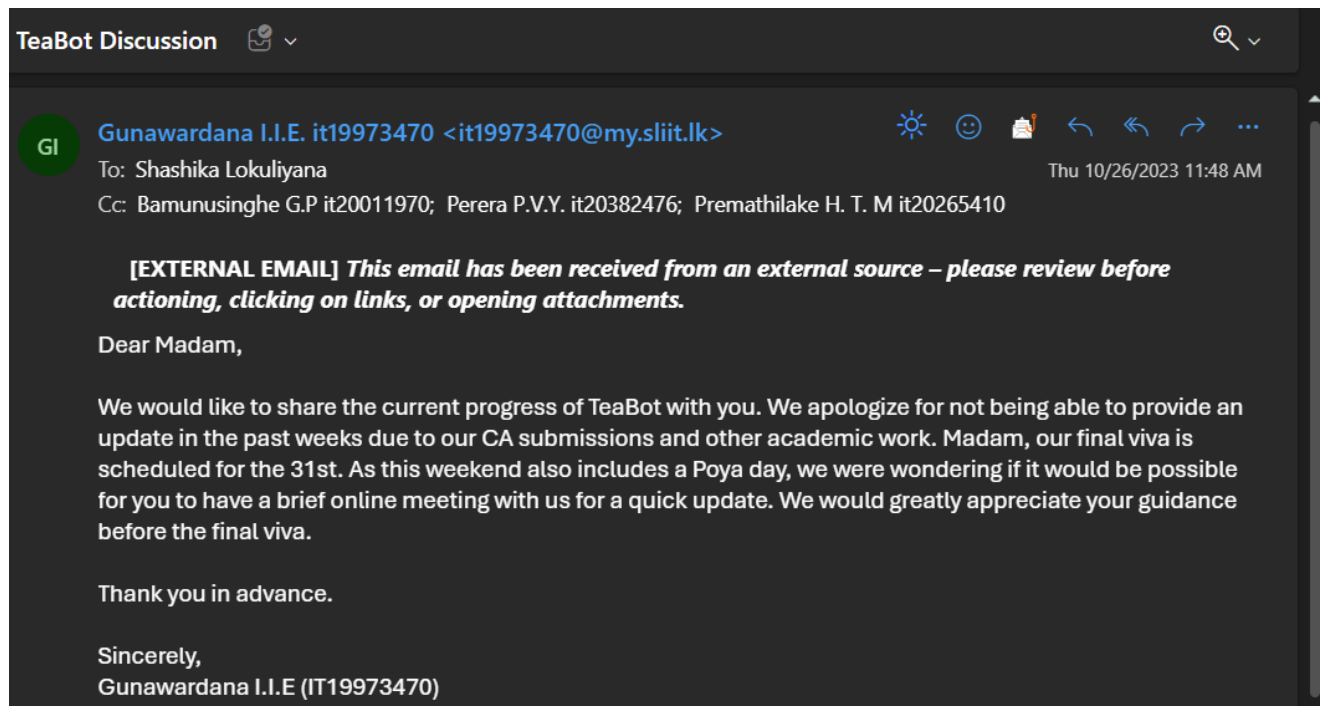


Figure 1.1.1: Final Viva discussion

- In this section, we have included the emails that were sent to our supervisor and co-supervisor, where we requested available time slots for upcoming meetings.

1.2 Meetings with External Supervisor

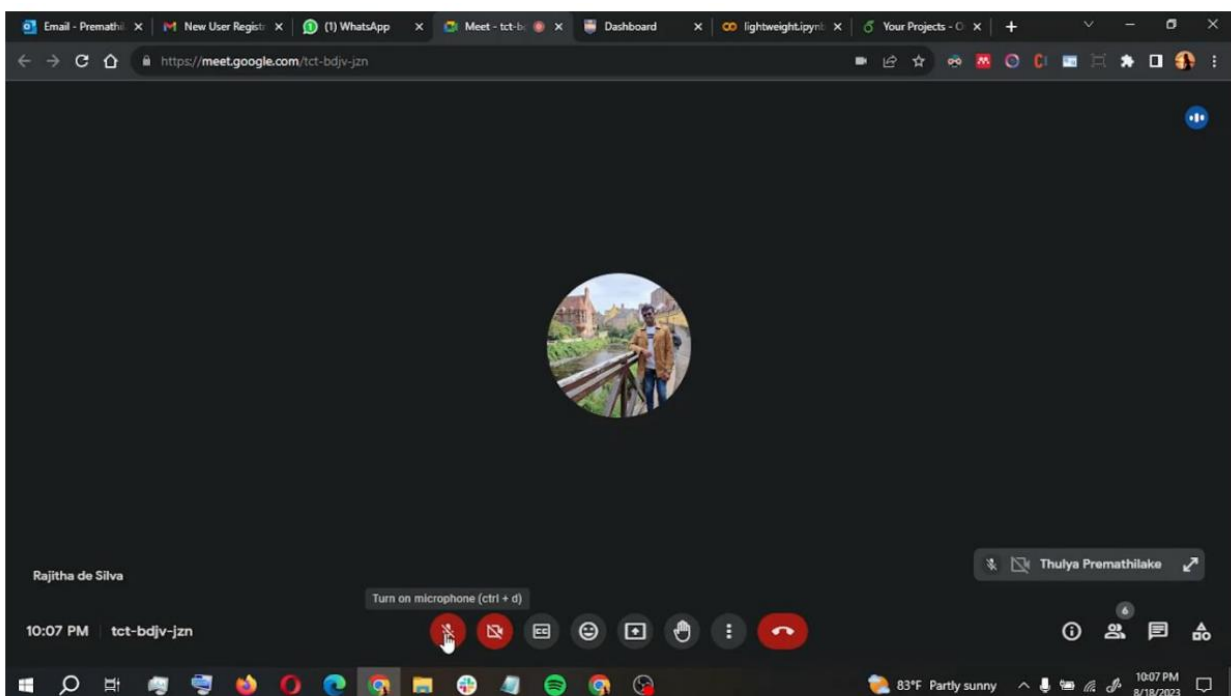
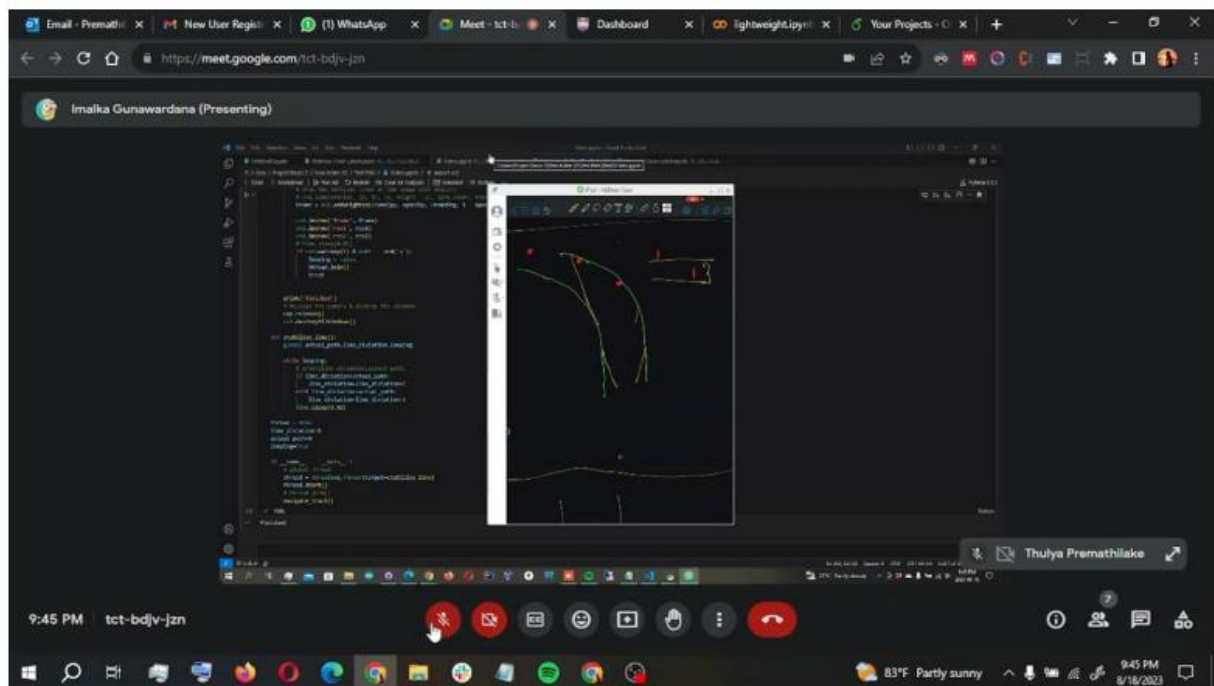


Figure 1.2.1: Components Modification

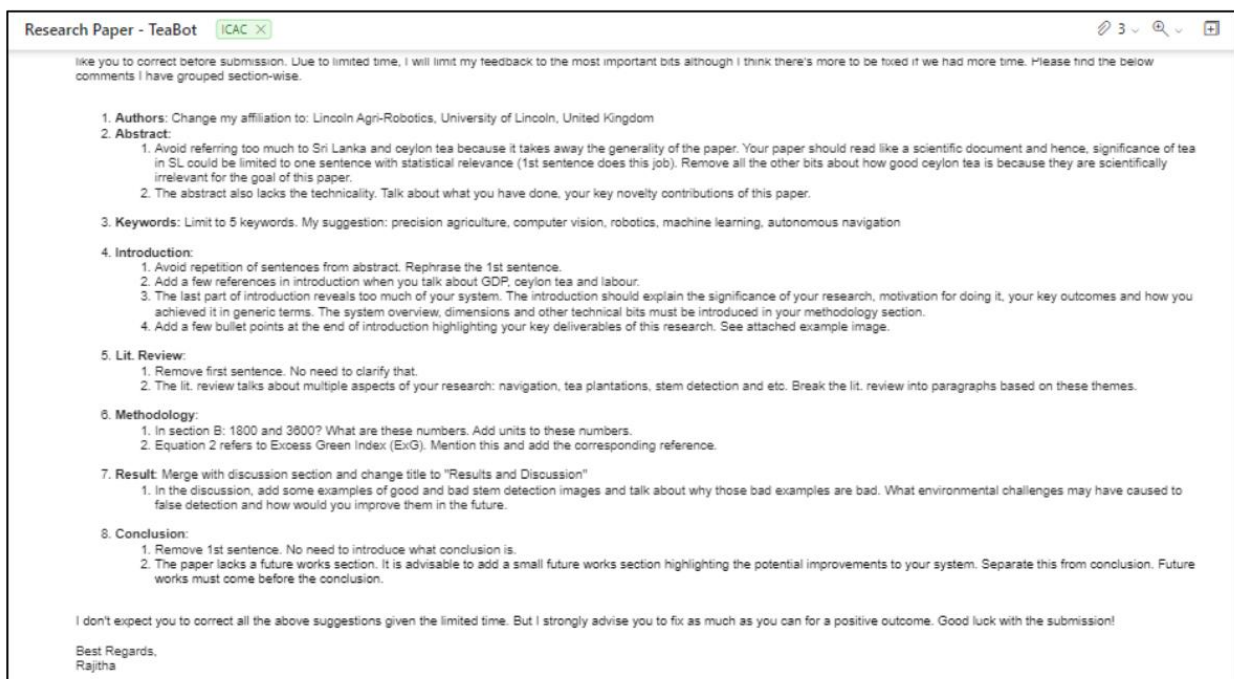
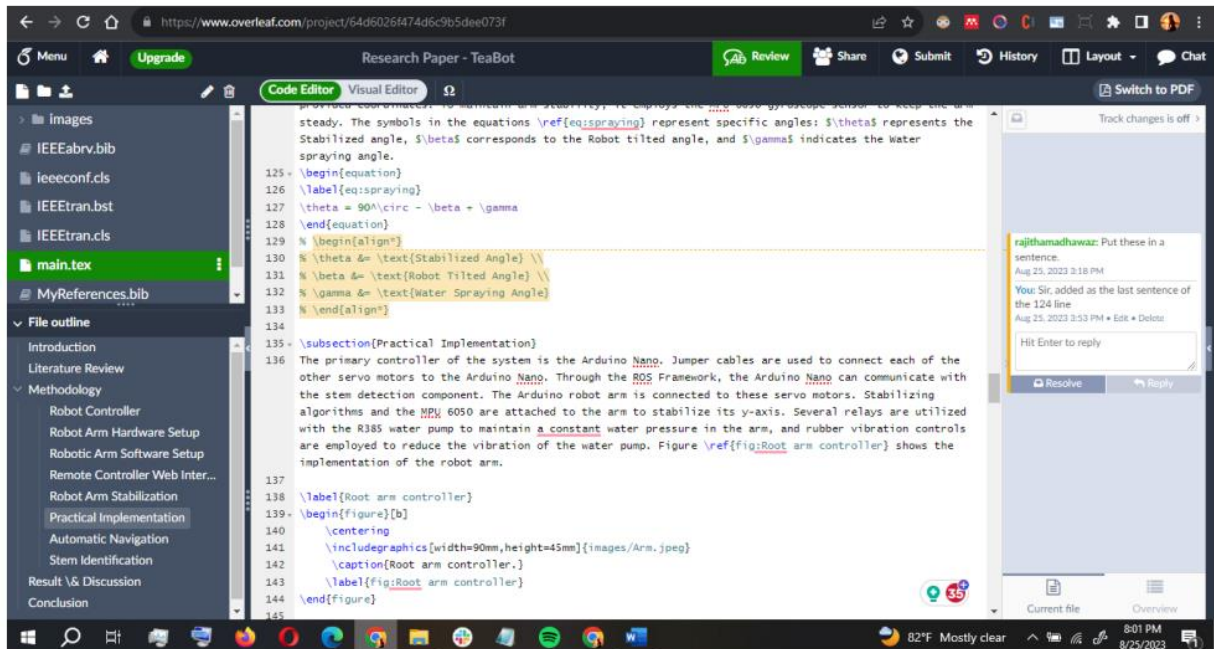


Figure 1.2.2: Research Paper Writing

1.3 Meetings with the team

General

Posts

Files

Tasks

+

Meet

Wednesday, June 21, 2023

PI

Premathilake H. T. M it20265410 6/21 10:08 PM

https://drive.google.com/drive/folders/1rKJn0XN3R-nJN6H_Z0FXxVsrBd-3HVL3?usp=sharing

Reply

PI

Premathilake H. T. M it20265410 6/21 10:15 PM

Task	2022	2023											
	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Topic Selection													
Requirement Gathering													
Project Charter													
Project Proposal Document													
Project Proposal Presentation													
System Designing													
Implementation													
Progress Presentation 1													
Research Paper													
Testing													
Final Report													
Progress Presentation 2													
Logbook & Website													
Final Presentation													
Final Report													

Reply

Thursday, June 29, 2023

Meeting in "General" ended:

PI

Reply

General

Posts

Files

Tasks

+

Meet

PP2 Slide Deck ended: 1h 16m

Reply

PP2 Slides started

Collapse all

PI

Perera P.V.Y. it20382476 8/27 4:41 PM

Mobile-UNet employs depth-wise separable convolutions and skip-connectors to efficiently capture features in the given inputs. Mobile-UNet's decoder network uses up-sampling feature maps and concatenation with skip connectors to reconstruct high-resolution segmentation maps from the compact feature representations generated by the encoder, ensuring precise navigation path prediction.

See less

Meeting ended: 1h 32m

PI

Reply

General

Posts
Files
Tasks
+

Meet

PI

Premathilake H. T. M it20265410 9/2 6:52 PM
PP2 Slides.pptx

PI

Perera P.V.Y. it20382476 9/2 7:00 PM
Algorithm development for stem identification
calculating the position of the end of the stem
capturing a frame from the video through the webcam

Meeting ended: 3h 56m

PI
PI

Reply

Sunday, September 3, 2023

General started

Collapse all

Recording has started

Recording has stopped. Saving recording...

Meeting

Recorded by: Perera P.V.Y. it203...

3h 9m

This recording is set to expire. View or change the expiration date [here](#). [Learn more](#)

Meeting ended: 12h 20m

GI
PI

Reply

General

Posts
Files
Tasks
+

Meet

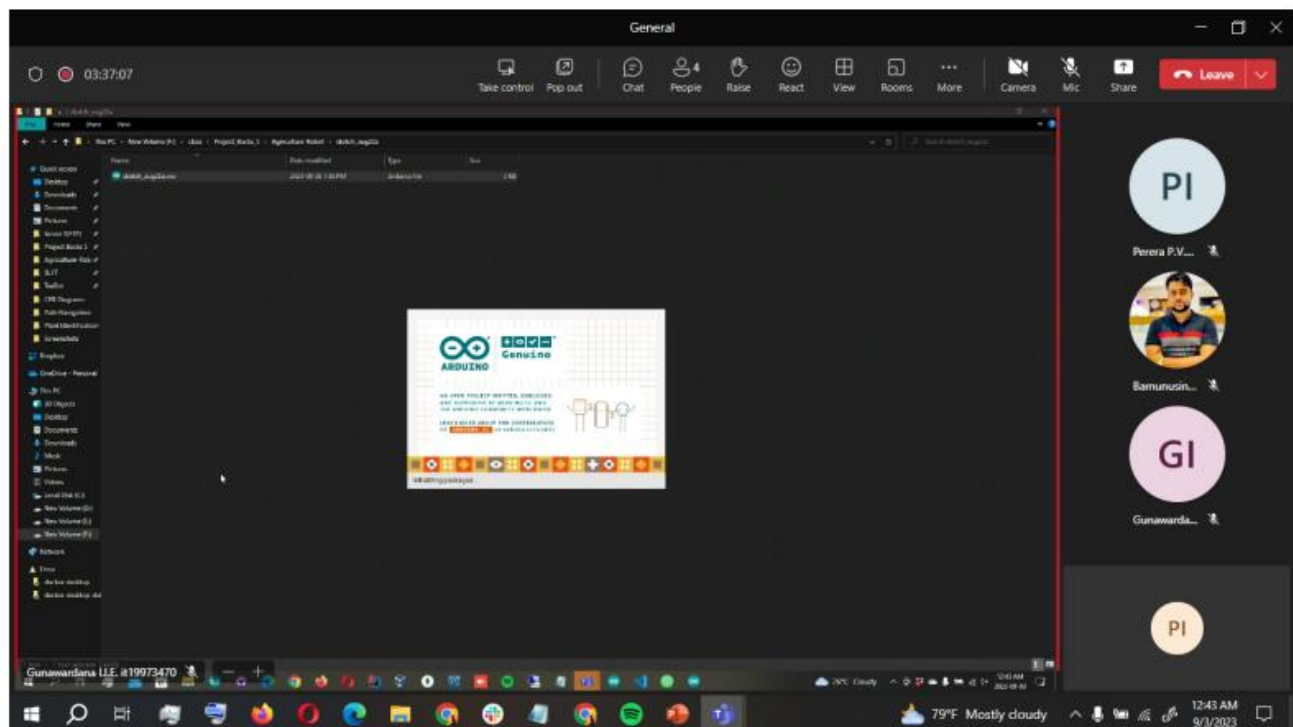
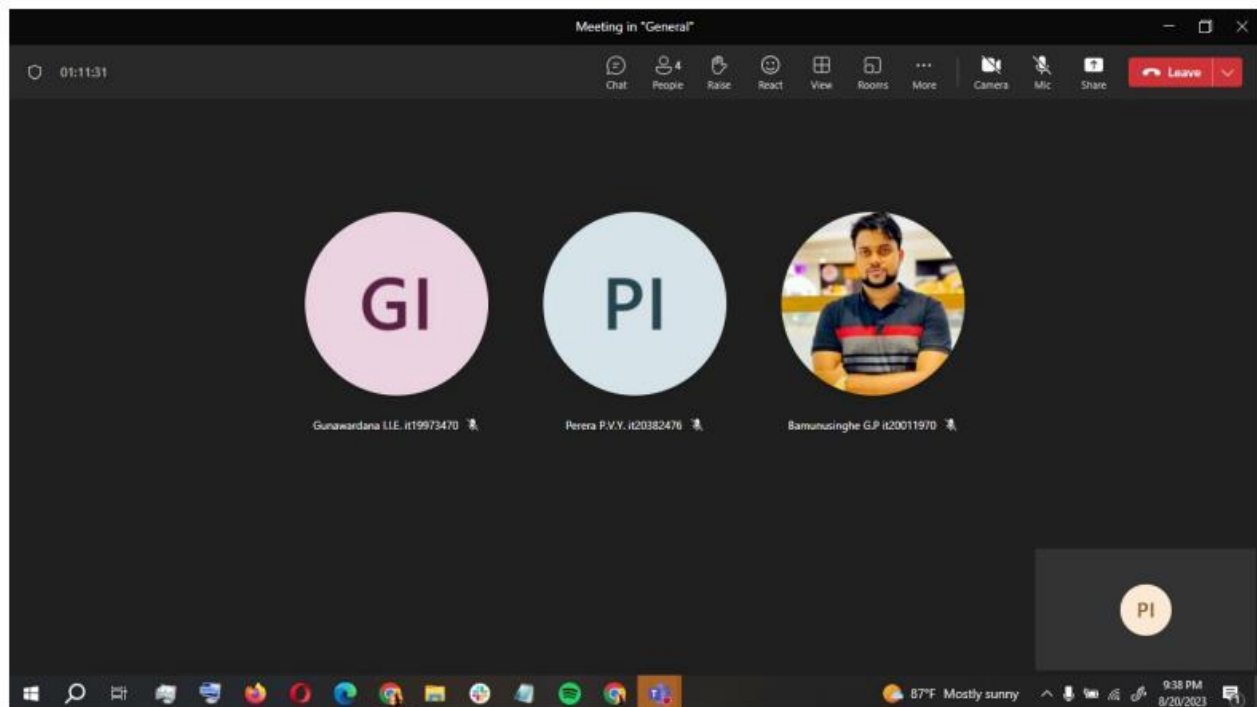
+ New

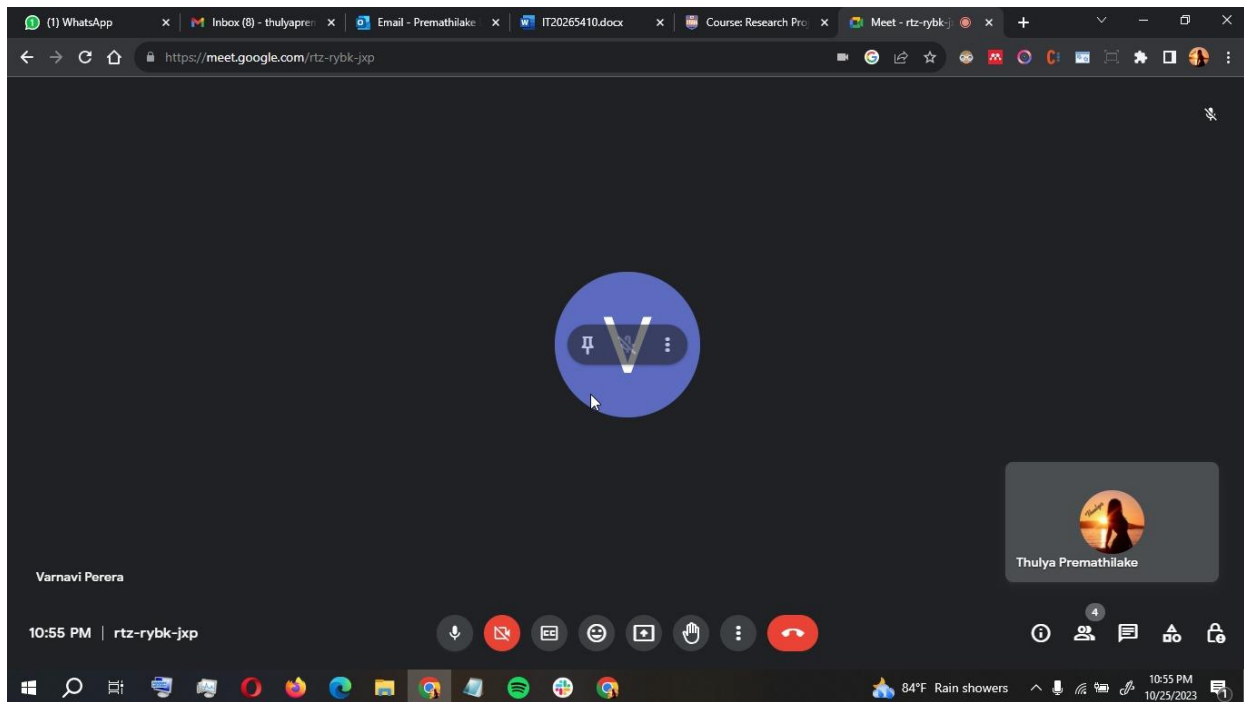
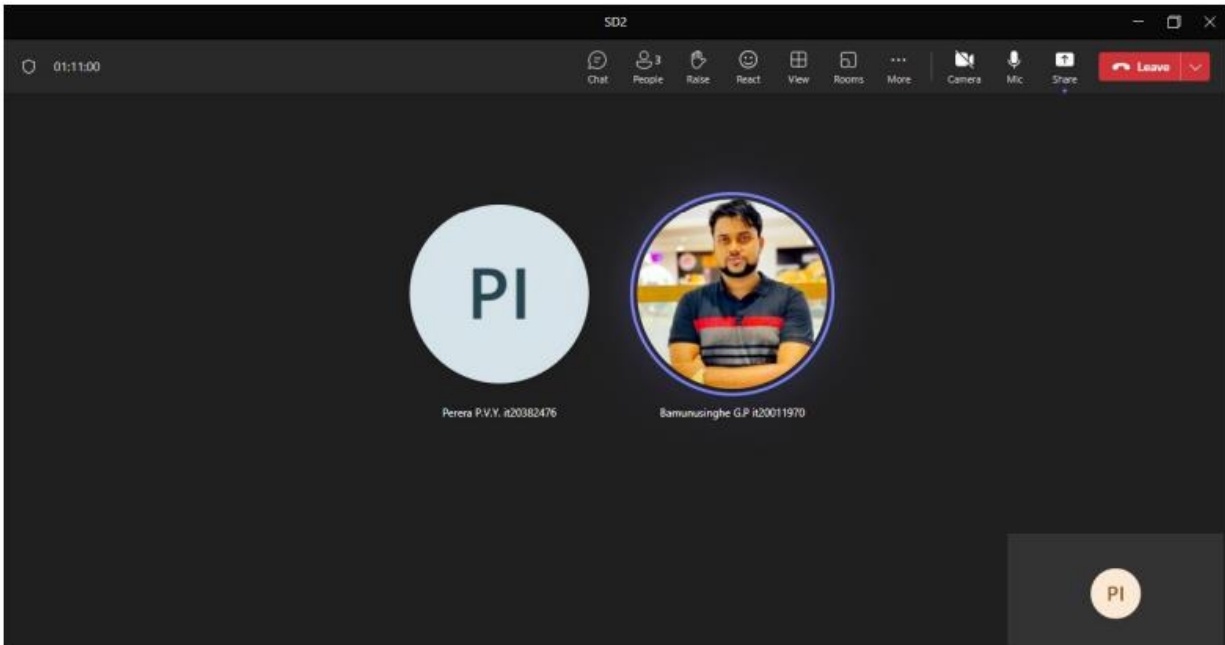
Upload
Share
Copy link
Sync
Download

All Documents*

... > General > Bamunusinghe G.P it20011970, Perera P.V.Y. it20382476, Premathilake H. T. M it20265410

Name	Modified	Modified By
Modified By : Premathilake H. T. M it20265410 (1)		
Recordings	March 3	Premathilake H. T. ...
Modified By : Perera P.V.Y. it20382476 (4)		
agri robot.pdf	February 8	Perera P.V.Y. it2038...
IT4010-TAF (2).docx	February 8	Perera P.V.Y. it2038...
TA (1).docx	February 8	Perera P.V.Y. it2038...
TA.docx	February 8	Perera P.V.Y. it2038...
Modified By : Bamunusinghe G.P it20011970 (1)		
Submitted Docs	March 13	Bamunusinghe G.P...





1.4 Emails to the Supervisor

Requesting for the supervision for the research project

GI

Gunawardana I.I.E. it19973470 <it19973470@my.sliit.lk>
To: Shashika Lokuliyana
Cc: Hettiarachchi T. C. D. S. it19206806; Perera P.V.Y. it20382476; +2 others

Thu 2/2/2023 12:30 PM

[EXTERNAL EMAIL] This email has been received from an external source – please review before actioning, clicking on links, or opening attachments.

Dear Madam,

We are a group of SE, IT, and DS. We would like to have you as our final year research project supervisor because the previous year's student who did Tangi Guru, Thiwanka Cholitha, recommended you as a supportive supervisor. So, we discussed many research areas and identified that increasing the productivity of agricultural fields will be a good impact on Sri Lanka.

As our topic, we have chosen to develop, an agriculture robot for large-scale agriculture fields.

We are looking forward to a positive reply from you.

Thank you!

Best Regards,

Gunawardana I.I.E

Requesting for the co-supervision for the research project

GI

Gunawardana I.I.E. it19973470 <it19973470@my.sliit.lk>
To: Narmada Gamage
Cc: Hettiarachchi T. C. D. S. it19206806; Perera P.V.Y. it20382476; +2 others

Thu 2/2/2023 12:35 PM

[EXTERNAL EMAIL] This email has been received from an external source – please review before actioning, clicking on links, or opening attachments.

Dear Madam,

We are a group of SE, IT, and DS. We would like to have you as our final year research project co-supervisor because the previous year's student who did Tangi Guru, Thiwanka Cholitha, recommended you as a supportive co-supervisor. So, we discussed many research areas and identified that increasing the productivity of agricultural fields will be a good impact on Sri Lanka.

As our topic, we have chosen to develop, an agriculture robot for large-scale agriculture fields.

We are looking forward to a positive reply from you.

Thank you!

Best Regards,

Gunawardana I.I.E

Requesting for an Available Time Slot on 23rd Sunday to Discuss "TeaBot" Research Project



GI

Gunawardana I.I.E. it19973470 <it19973470@my.sliit.lk>

To: Shashika Lokuliyana

Cc: Perera P.V.Y. it20382476; Premathilake H. T. M it20265410; Bamunusinghe G.P it20011970



Wed 4/19/2023 11:25 AM

[EXTERNAL EMAIL] This email has been received from an external source – please review before actioning, clicking on links, or opening attachments.

Dear Madam,

You mentioned us previously to meet on 23rd of Sunday after 12:30 PM to discuss the progress of our "TeaBot" research project. Could you kindly let me know if there is any availability on Sunday 23rd to discuss about the research?

Thank you for your time and consideration.

Best regards,

Gunawardana I.I.E (IT19973470)



Discuss the TeaBot Research

Follow up



This event occurred 6 months ago (Sun 4/23/2023 11:45 AM - 12:15 PM)



Microsoft Teams Meeting;
Teams meeting



Gunawardana I.I.E. it19973470 <it19973470@my.sliit.lk> invited you [Didn't respond 4](#)

Messages

Meeting Details



[EXTERNAL EMAIL] This email has been received from an external source – please review before actioning, clicking on links, or opening attachments.

Discuss the TeaBot Research

Organizer



Gunawardana I.I.E. it19973470
Sent on Friday, 4/21/2023 at 9:23 AM

Didn't respond: 4



Shashika Lokuliyana
Required



Perera P.V.Y. it20382476
Required



Premathilake H. T. M it20265410
Required



Bamunusinghe G.P it20011970
Required

Microsoft Teams meeting

Join on your computer, mobile app or room device
[Click here to join the meeting](#)

Meeting ID: 443 648 677 991

Passcode: rnxrt6

[Download Teams](#) | [Join on the web](#)

Requesting for an Available Time Slot on 14th Sunday to Discuss "TeaBot" Research Project



GI

Gunawardana I.I.E. it19973470 <it19973470@my.sliit.lk>



To: Shashika Lokuliyana

Wed 5/10/2023 5:48 PM

Cc: Perera P.V.Y. it20382476; Premathilake H. T. M it20265410; Bamunusinghe G.P it20011970

[EXTERNAL EMAIL] This email has been received from an external source – please review before actioning, clicking on links, or opening attachments.

Dear Madam,

As per the previous discussion, we discussed to meet again on 14th of Sunday to see the progress of our "TeaBot" research project. Could you kindly let me know if there is any availability on Sunday 14th to discuss the research?

Thank you for your time and consideration.

Best regards,

Gunawardana I.I.E (IT19973470)



TeaBot Discussion

Follow up ▾



This event occurred **5 months ago** (Tue 5/16/2023 3:00 PM - 3:30 PM)



Microsoft Teams Meeting;
Teams meeting



Gunawardana I.I.E. it19973470 <it19973470@my.sliit.lk> invited you [Declined 1](#), [Didn't respond 3](#)

Messages

Meeting Details



[EXTERNAL EMAIL] This email has been received from an external source – please review before actioning, clicking on links, or opening attachments.

To discuss the teabot research

Microsoft Teams meeting

Join on your computer, mobile app or room device

[Click here to join the meeting](#)

Organizer



Gunawardana I.I.E. it19973470
Sent on Monday, 5/15/2023 at 4:25 PM

▽ No: 1



Shashika Lokuliyana
Required

▽ Didn't respond: 3



Perera P.V.Y. it20382476
Required



Premathilake H. T. M it2026...
Required

TeaBot Discussion

Follow up

⌚

This event occurred **4 months ago** (Fri 6/2/2023 10:00 AM - 10:30 AM)

📍

Microsoft Teams Meeting;
Teams meeting

👤

Gunawardana I.I.E. it19973470 <it19973470@my.sliit.lk> invited you [Didn't respond 4](#)

Messages

Meeting Details

☰

[EXTERNAL EMAIL] This email has been received from an external source. please review before actioning, clicking on links, or opening attachments.

TeaBot Discussion

Microsoft Teams meeting

Join on your computer, mobile app or room device

[Click here to join the meeting](#)

Meeting ID: 428 033 701 504

Organizer

GI

Gunawardana I.I.E. it19973470

Sent on Thursday, 6/1/2023 at 4:59 PM

⌵

Didn't respond: 4

👤

Shashika Lokuliyana

Required

PI

Perera P.V.Y. it20382476

Required

P

Premathilake H. T. M it20265410

Required

👤

Bamunusinghe G.P it20011970

Required

Research Paper - TeaBot

🔗 3

🔍

📎

GI

Gunawardana I.I.E. it19973470 <it19973470@my.sliit.lk>

☀️

😊

📎

↩️

↩️

↪️

⋮

To: Shashika Lokuliyana; Narmada Gamage

Wed 8/16/2023 10:28 AM

Cc: Premathilake H. T. M it20265410; Perera P.V.Y. it20382476; Bamunusinghe G.P it20011970

📎

Intelligent Agriculture Robot ...

662 KB

[EXTERNAL EMAIL] This email has been received from an external source – please review before actioning, clicking on links, or opening attachments.

Dear Madam,

I hereby attached the final version (up to now) of the paper. We only submitted the paper to the ICAC. Because of the busy with project work, we were bit late to complete the paper and we had only the time to do only Rajitha sir's comments. But we heard yesterday, the ICAC deadline was extended. So, we hope to do another amendments given by Narmada madam and do some improvements and resubmit the paper to the ICAC.

Madam, shall we arrange a meeting to share the updates on the project? Can you provide us a free date and a time slot to discuss the project? We will explain the source codes and the functionalities of the robot on the meeting day.

Thank you

Regards,
Gunawardana I I E

Request for Available Time Slot to Discuss Progress on the "TeaBot" Research Project



Gunawardana I.I.E. it19973470 <it19973470@my.sliit.lk>



To: Shashika Lokuliyana

Wed 8/23/2023 2:05 PM

Cc: Premathilake H. T. M it20265410; Bamunusinghe G.P it20011970; +2 others

[EXTERNAL EMAIL] This email has been received from an external source – please review before actioning, clicking on links, or opening attachments.

Dear Madam,

We are reaching out to request an available time slot for a discussion concerning the recent developments in our "TeaBot" research project. The extension of the ICAC submission deadline is until August 30th, and we have been working with Rajitha Sir to implement further enhancements. Additionally, we are working on the amendments suggested by Narmada Madam.

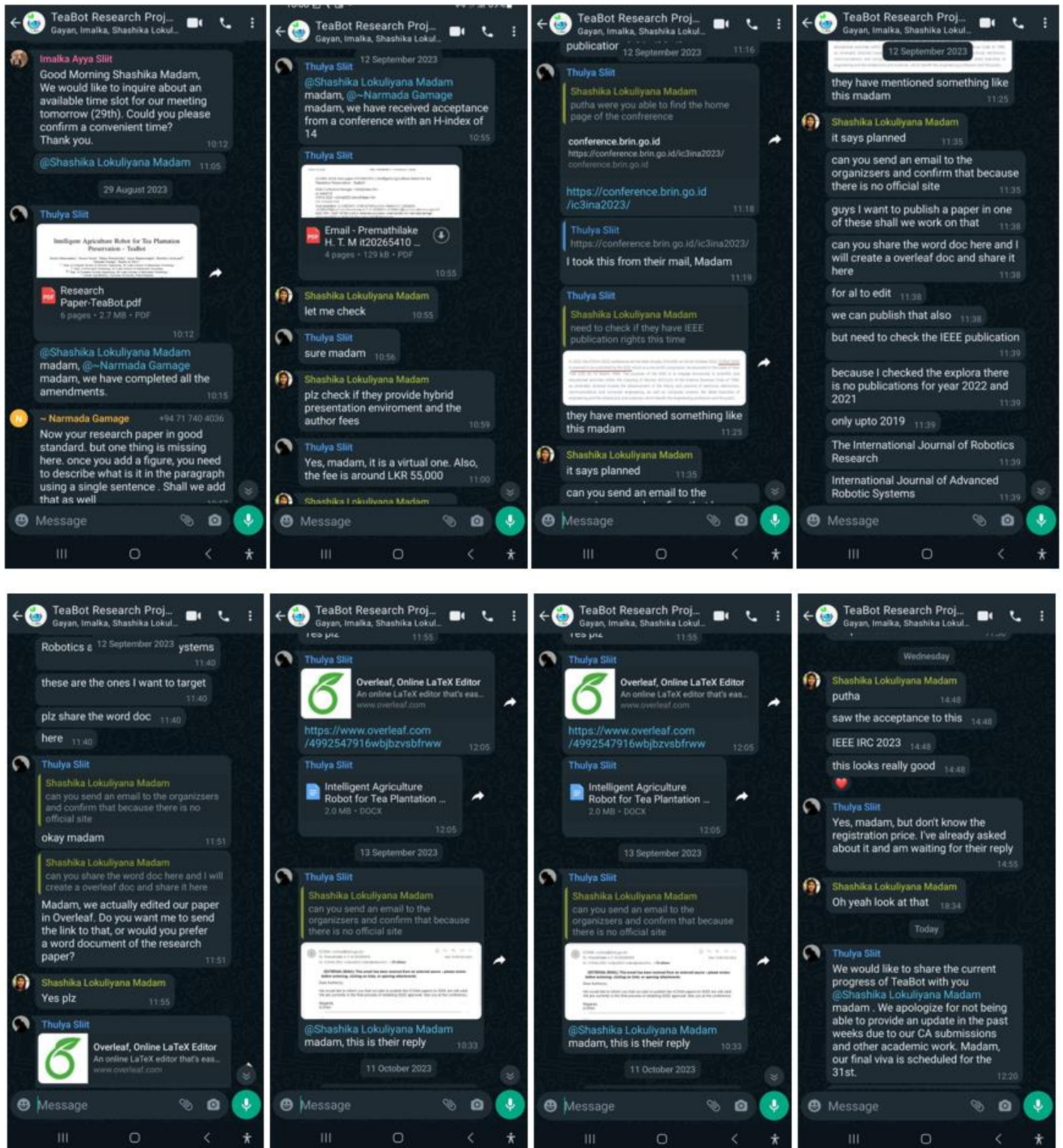
Our intention is to present both the project updates and our research paper for your review. Considering your demanding schedule madam, we kindly ask for your assistance in identifying a suitable date and time for the meeting.

Your time and consideration are highly valued. Thank you for your continued support.

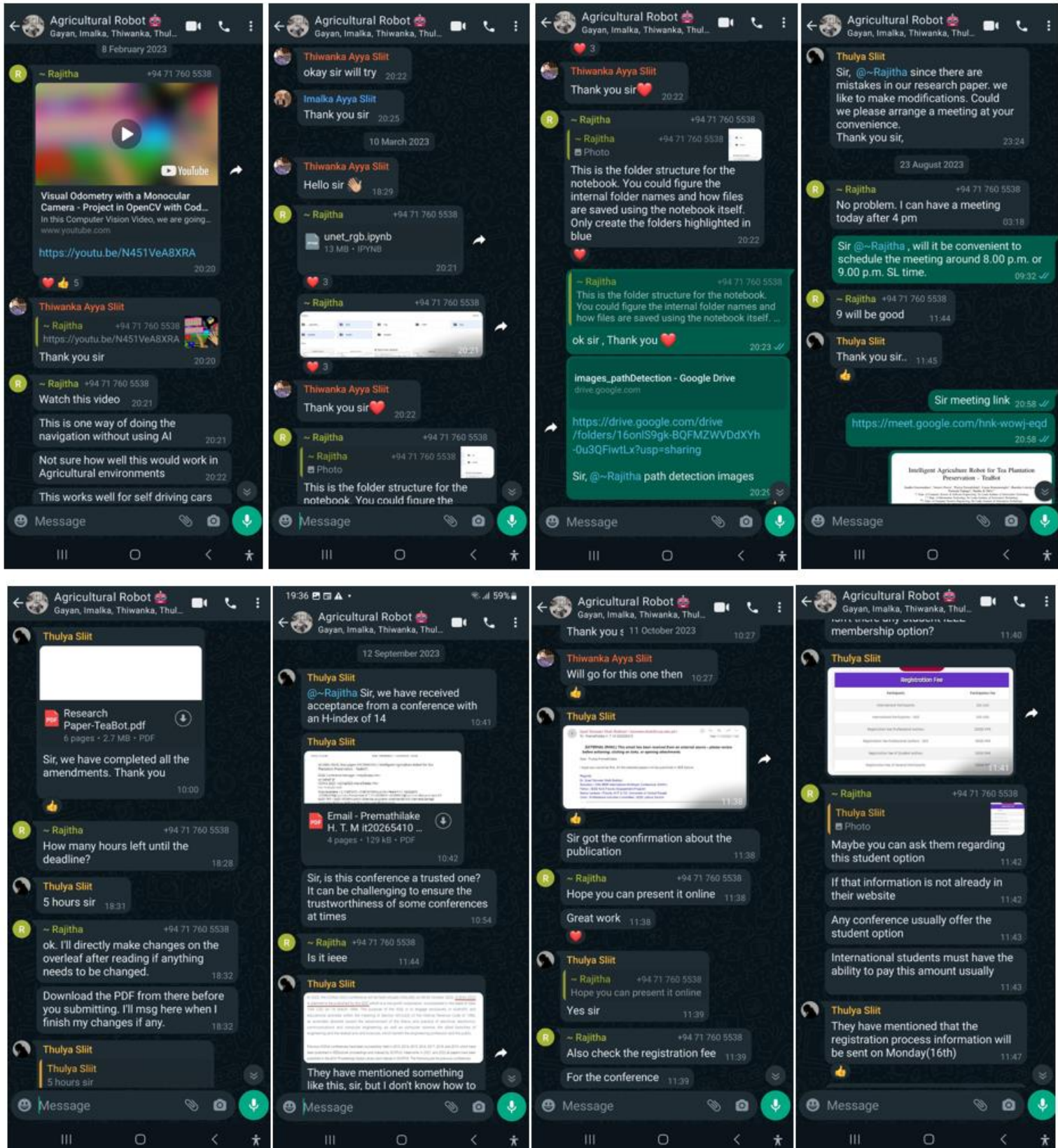
Best Regards,
Gunawardana I.I.E

1.5 Messages

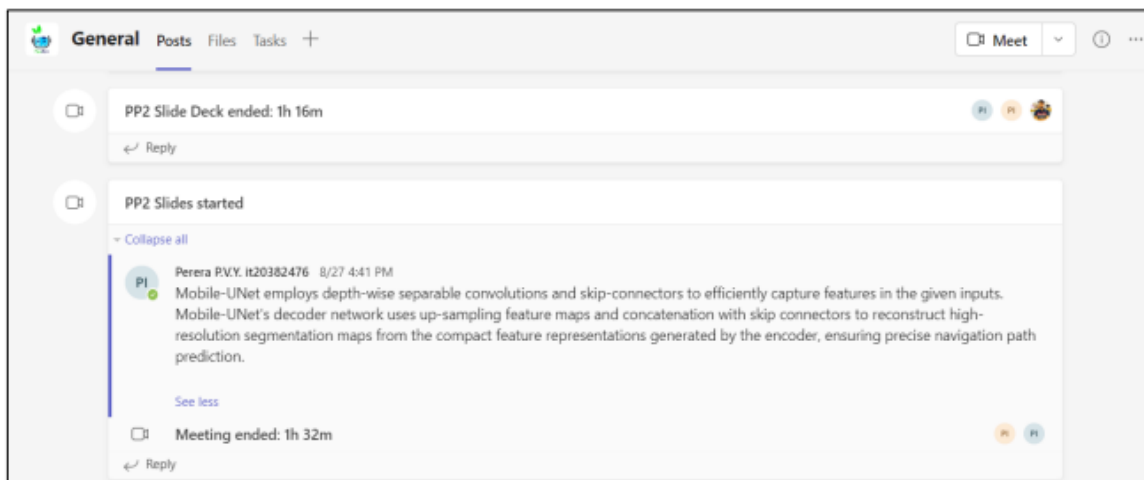
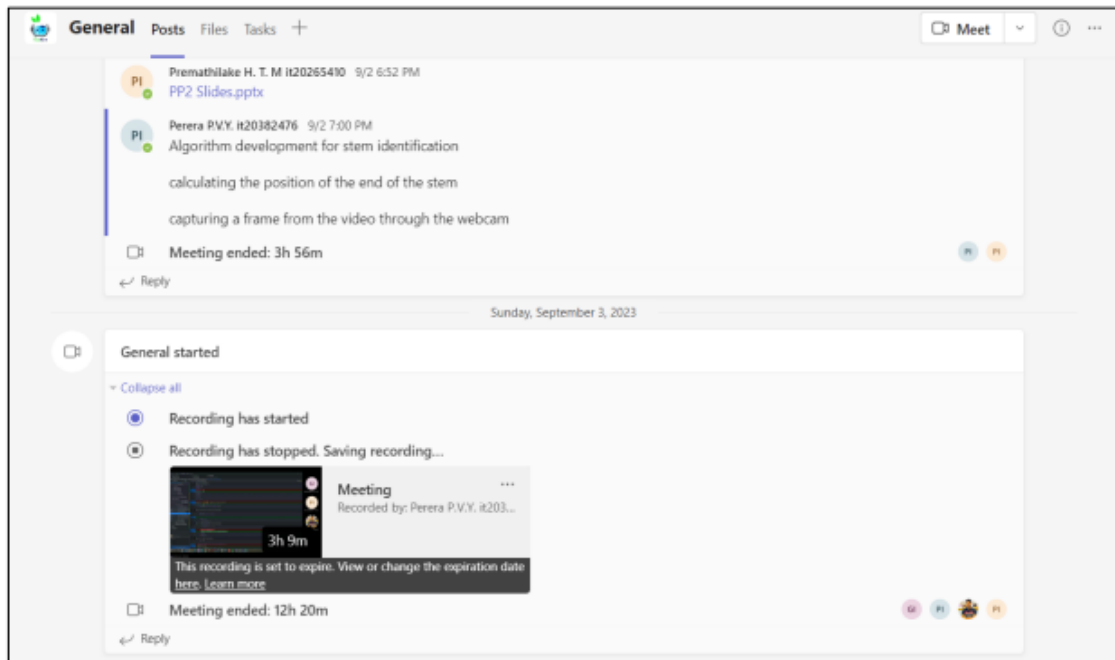
1.5.1 Messages with the supervisor



1.5.2 Messages with the External Supervisor

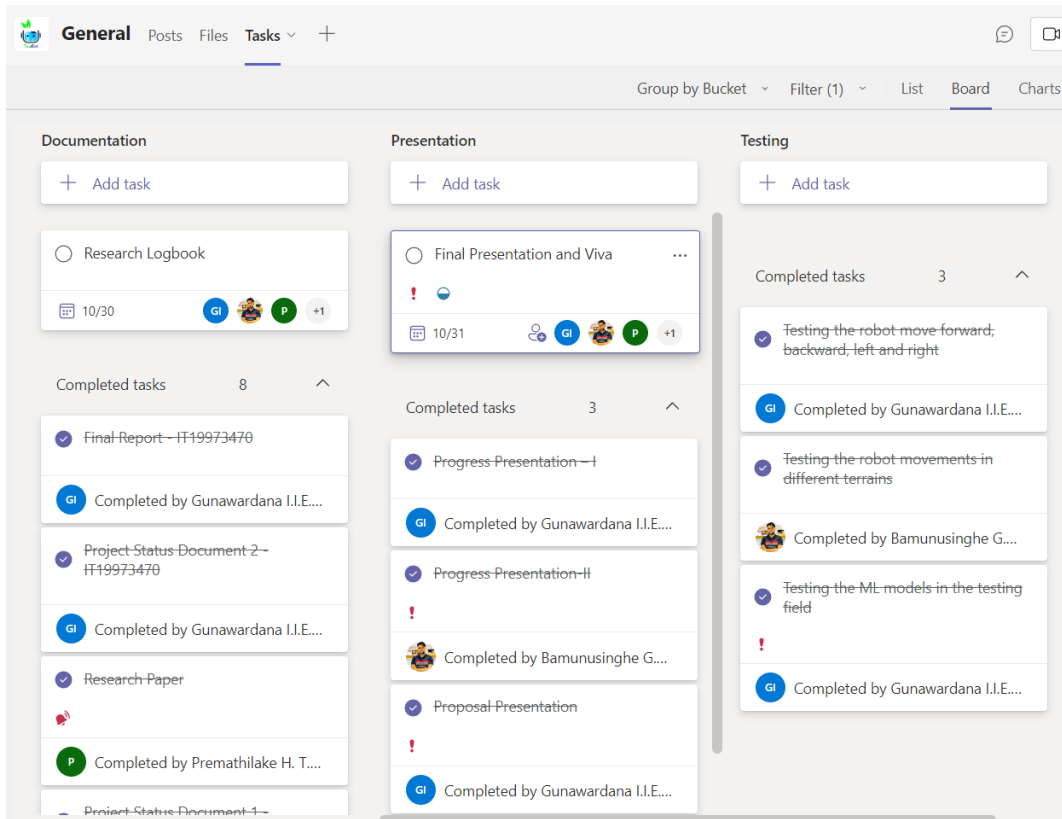
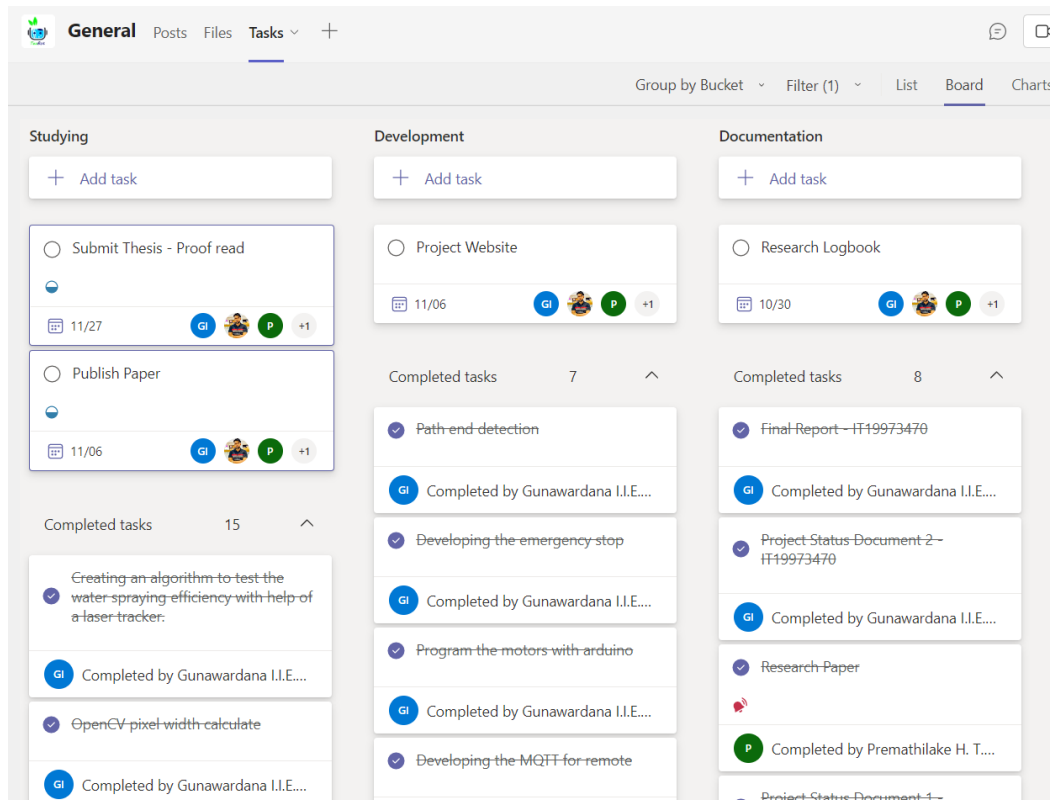


1.5.3 Messages in the official TeaBot Group



2 Individual Project Logs

2.1 MS Planner



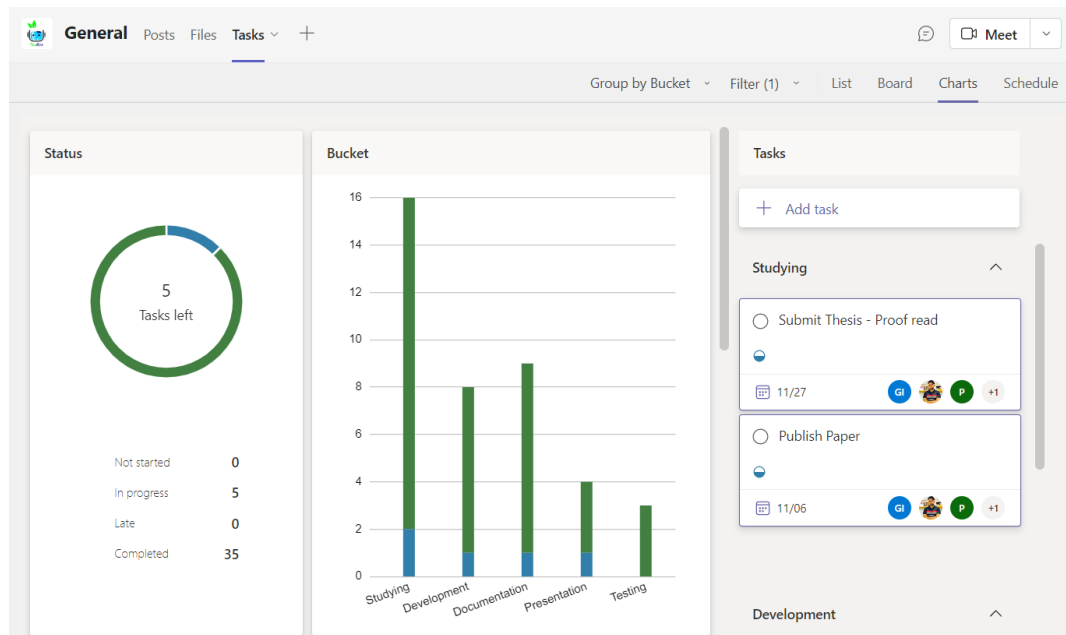


Figure 2.1.2: Chart View of Tasks

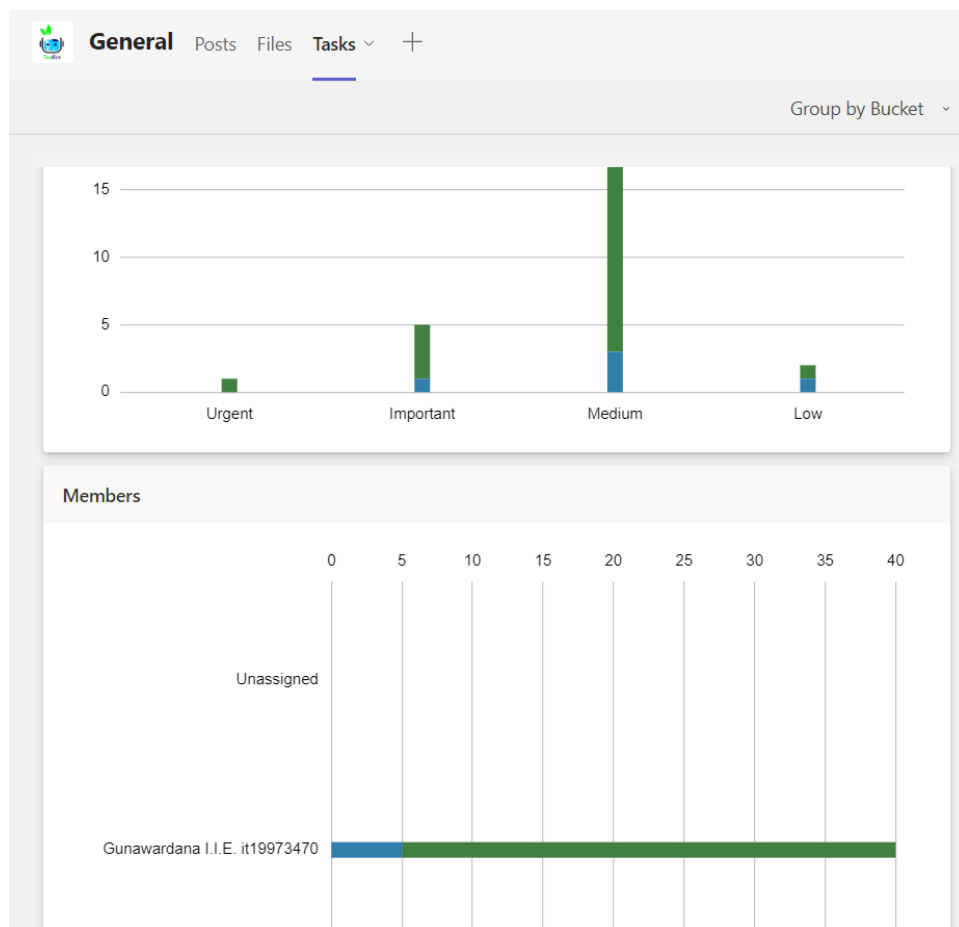
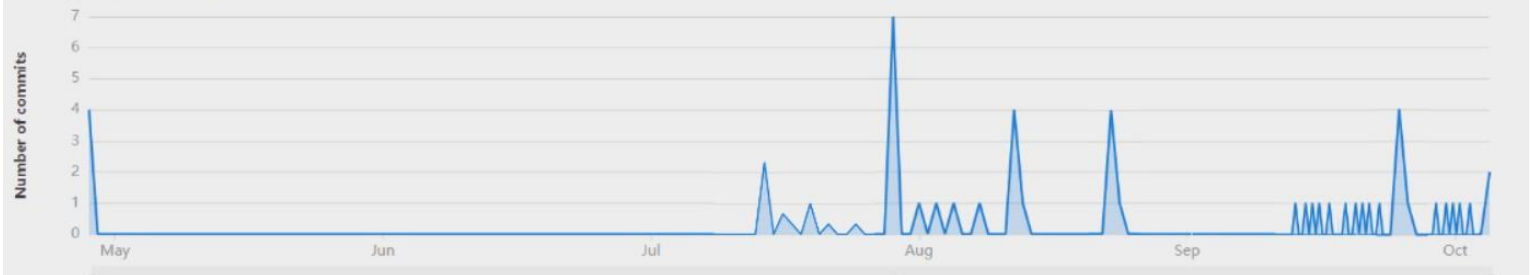


Figure 2.1.1: Completed Tasks on Teams Charts

2.2 Git Lab

Commits to it19973470_imalka

Excluding merge commits. Limited to 6,000 commits.



3 Monthly Progress

3.1 2022 November 1st to 30th

- In November, we initiated the process of choosing research topics for our project since the submission deadline was looming on February 10th. On November 10th, 2022, we commenced our research journey with the inaugural Research Project Lecture, officially marking the beginning of our project.
- To kickstart the topic selection process, we employed mind maps to delve into different research domains and potential aspects that we could delve into. Concurrently, we also started the task of identifying potential mentors, co-mentors, and external advisors who could provide guidance for our research pursuits.
- Throughout that month, we actively participated in in-depth dialogues with potential advisors. During these interactions, we presented and deliberated on every suggested research topic and its various components. These conversations played a vital role in aiding us to arrive at an educated decision regarding the most appropriate research topic to pursue.
- After meticulous consideration and the valuable input received from our mentors, we eventually arrived at a definitive research topic. With our topic selected, we defined the boundaries of our research team and readied ourselves to progress within this specific area of study.

3.2 2022 January 1st to 31st

- The deadline for submitting the topic evaluation was scheduled for January 20th. As a result, our preparations for this evaluation process commenced on December 1st. During this timeframe, we took great care in refining the topic evaluation document, ensuring it adhered to all the essential criteria. On January 20th, we successfully delivered the document and eagerly awaited the outcome of the topic evaluation. When we received the results, we were pleased to discover that our project had been accepted with only minor revisions needed. We promptly engaged in discussions with our supervisors to gain a more profound understanding of the feedback and recommendations provided. Subsequently, we made the necessary adjustments to address these minor revisions and enhance the overall quality of our project. After addressing the feedback and revisions, we shifted our focus to crafting the project charter, commencing this phase on January 21st, marking the next steps in our research journey.



IT4010 – Research Project - 2023 Topic Assessment Form

Project ID : TMP-23-044

1. Topic (12 words max)

"TeaBot" – Tea plantation preservation using an intelligent robot.

2. Research group the project belongs to

Autonomous Intelligent Machines and Systems (AIMS)

3. Research area the project belongs to

Robotics (R)

4. If a continuation of a previous project:

Project ID	
Year	

5. Team member details

Student Name	Student ID	Specialization
Leader: Gunawardana I.I.E	IT19973470	SE
Member 2: Bamunusinghe G.P	IT20011970	SE
Member 3: Premathilake H.T.M	IT20265410	IT
Member 4: Perera P.V.Y	IT20382476	DS

- After finalizing our research topic with minor adjustments, we moved on to prepare the project charter and the necessary cover sheet, with the submission deadline set for January 30th. Subsequently, our attention turned to drafting the proposal, which must be completed by March 24th.



Sri Lanka Institute of Information Technology

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)

TeaBot: Tea plantation preservation using an intelligent robot

RESEARCH GROUP
(As per the Topic
Assessment Form)

Robotics & Intelligent Systems

PROJECT NUMBER

(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	Gunawardana I.I.E	IT19973470	077 678 8890	it19973470@my.sliit.lk
2	Perera P.V.Y	IT20382476	071 881 8052	it20382476@my.sliit.lk
3	Premathilake H.T.M	IT20265410	076 553 5277	it20265410@my.sliit.lk
4	Bamunusinghe G.P	IT20011970	076 640 9484	it20011970@my.sliit.lk

SUPERVISOR, CO_SUPERVISOR Details

SUPERVISOR Name	CO-SUPERVISOR Name
Ms. Shashika Lokuliyana	Ms. Narmada Gamage
Signature	Signature
Attach the email as Appendix 1	Attach the email as Appendix 1
24.03.2023	24.03.2023
Date	Date

EXTERNAL SUPERVISOR Details (If any, may be from the industry)

				Attach the email as Appendix 3
Name	Affiliation	Contact Address	Contact Numbers	Signature/Date
Mr. Rajitha De Silva	University of Lincoln	rajitha@ieee.org	0717605538	<i>Rajitha</i>

ACCEPTANCE BY CDAP MEMBER (This part will be filled by the RP team)

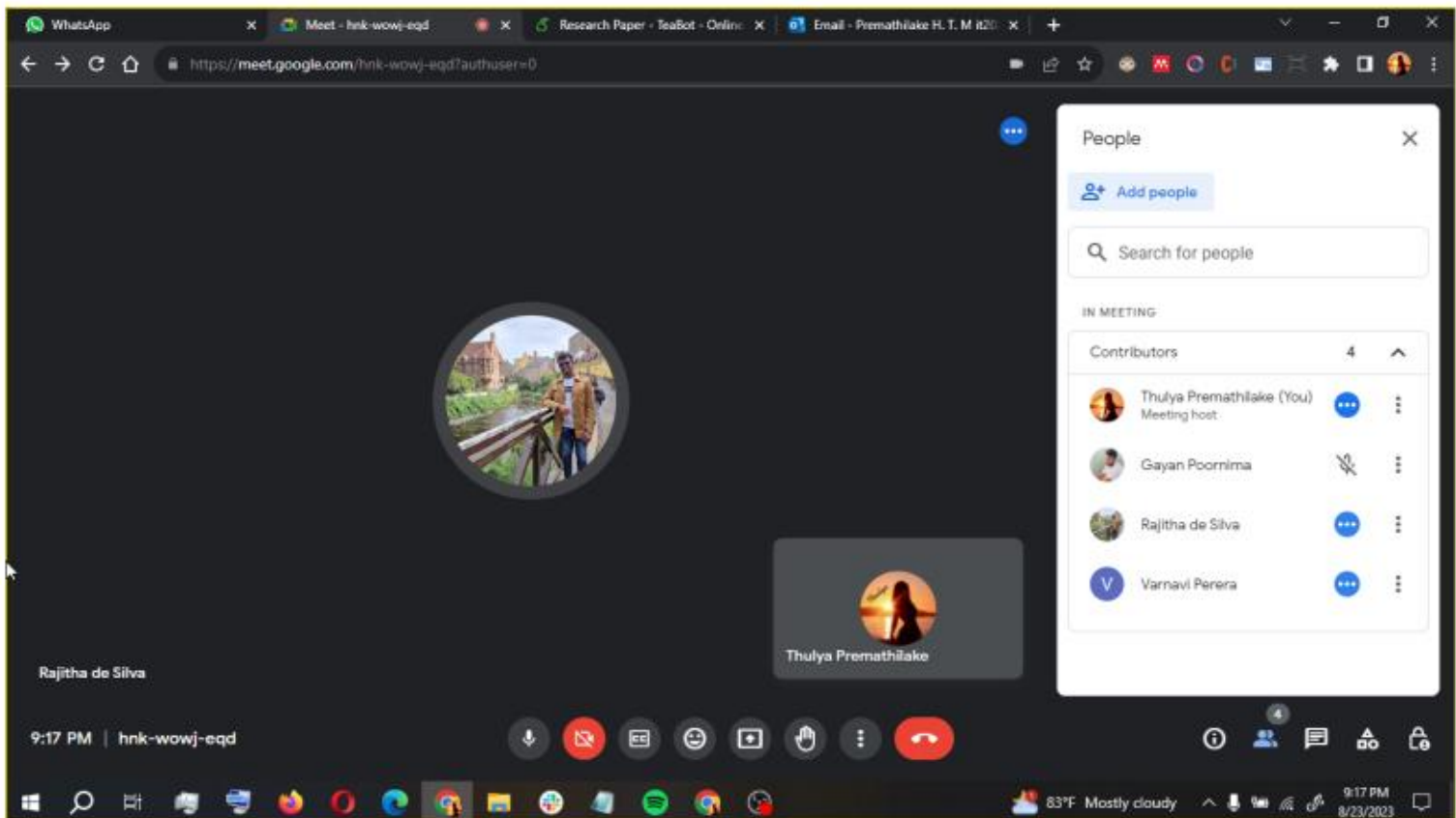
Name	Signature	Date

Figure 3.2.2: Project Cover Sheet

- After the proposal draft document slides were created to do the proposal presentations because the presentations were on the 27th of March.

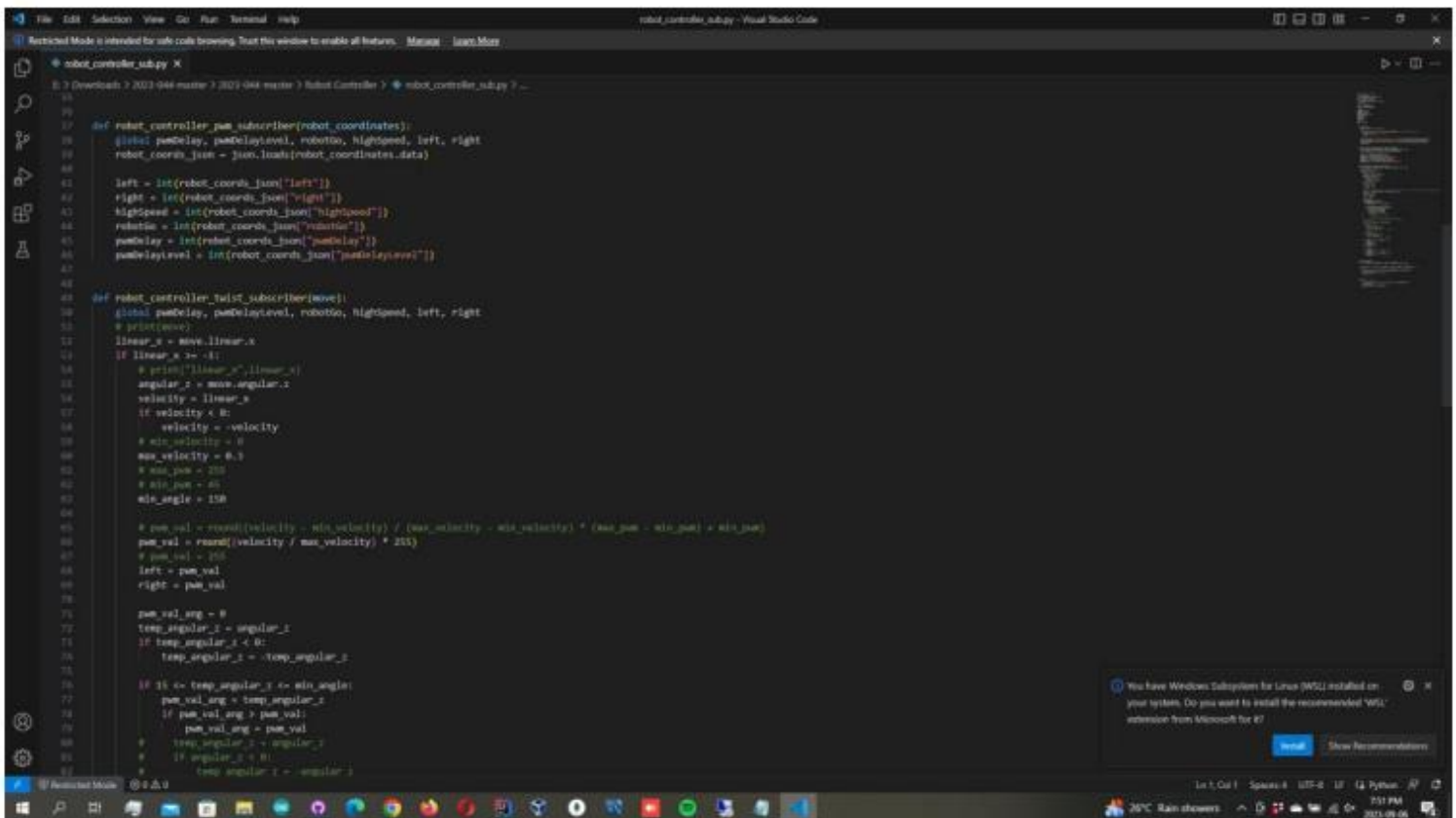
3.3 February 1st to 28th

-
- Around half of the project's weightage is attributed to the computer vision artificial intelligence component, which involves the collection of essential knowledge.
- During this month, we made preparations for our proposal presentation scheduled for March 27th.



3.4 2023 March 1st - 31st

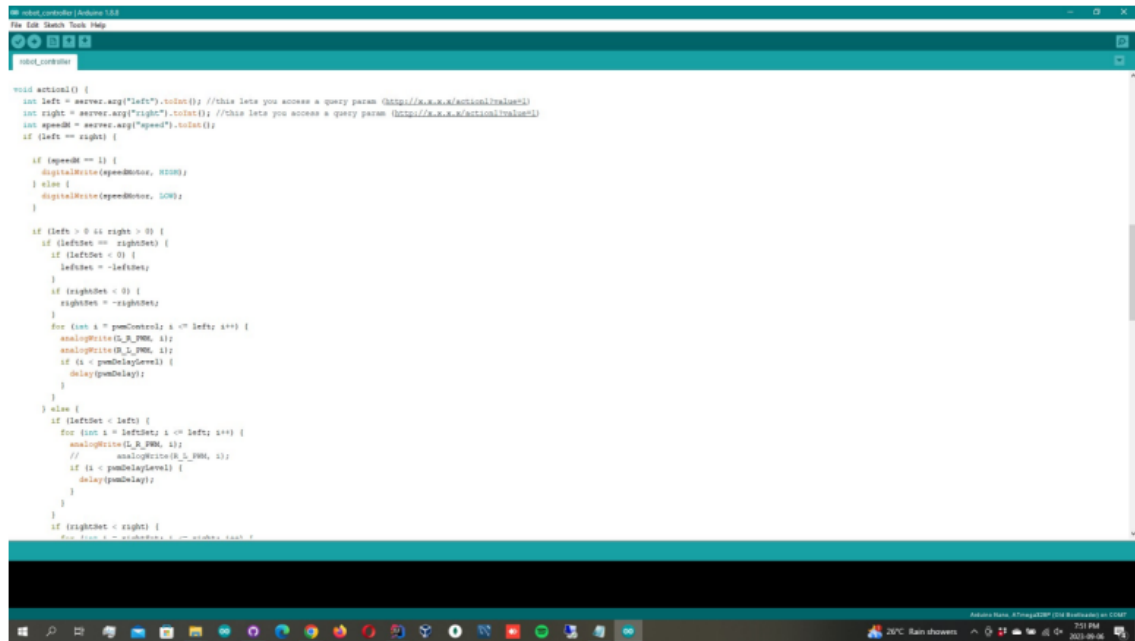
- The proposal presentation took place on March 27th, 2023, during which the proposal report was prepared.
- Following that, we received panel approval for the project and submitted the report.
- In the latter part of the month, we commenced the project's implementation phase.



```
10 robot_controller_pwm_subscriber(robot_coordinates):
11     global pwmDelay, pwmDelayLevel, robotOn, highSpeed, left, right
12     robot_coords_json = json.loads(robot_coordinates.data)
13
14     left = int(robot_coords_json["left"])
15     right = int(robot_coords_json["right"])
16     highSpeed = int(robot_coords_json["highSpeed"])
17     robotOn = int(robot_coords_json["robotOn"])
18     pwmDelay = int(robot_coords_json["pwmDelay"])
19     pwmDelayLevel = int(robot_coords_json["pwmDelayLevel"])
20
21 def robot_controller_twist_subscriber(move):
22     global pwmDelay, pwmDelayLevel, robotOn, highSpeed, left, right
23     # print(move)
24     linear_x = move.linear.x
25     if linear_x >= 0:
26         # print("linear_x", linear_x)
27         angular_z = move.angular.z
28         velocity = linear_x
29         if velocity < 0:
30             velocity = -velocity
31         # min_velocity = 0
32         max_velocity = 0.5
33         # min_pwm = 255
34         # min_pwm = 40
35         min_angle = 150
36
37         # pwm_val = round((velocity - min_velocity) / (max_velocity - min_velocity) * (max_pwm - min_pwm) + min_pwm)
38         pwm_val = round((velocity / max_velocity) * 255)
39         # pwm_val = 255
40         left = pwm_val
41         right = pwm_val
42
43         # temp_pwm_val = 0
44         temp_pwm_val = 0
45         if temp_pwm_val < 0:
46             temp_pwm_val = -temp_pwm_val
47
48         if 15 <= temp_pwm_val <= min_angle:
49             temp_pwm_val = temp_pwm_val
50             if temp_pwm_val > pwm_val:
51                 temp_pwm_val = pwm_val
52             # temp_pwm_val = angular_z
53             # if angular_z < 0:
54                 temp_pwm_val = -temp_pwm_val
```

3.5 2023 April 1st to 30th

- After getting the panel approval the implementation was started. Initially the motor control algorithm was created.



```
void action1() {
  int left = server.arg("left").toInt(); //this lets you access a query param (http://localhost:8080/left=1)
  int right = server.arg("right").toInt(); //this lets you access a query param (http://localhost:8080/right=1)
  int speed = server.arg("speed").toInt();
  if (left == right) {
    if (speed == 1) {
      digitalWrite(speedMotor, HIGH);
    } else {
      digitalWrite(speedMotor, LOW);
    }
  }

  if (left > 0 && right > 0) {
    if (leftDet == rightDet) {
      if (leftDet < 0) {
        leftDet = -leftDet;
      }
      if (rightDet < 0) {
        rightDet = -rightDet;
      }
      for (int i = pinControl; i <= leftDet; i++) {
        analogWrite(L_R_PWM, i);
        analogWrite(R_L_PWM, i);
        if (i < pinDelayLevel) {
          delay(pinDelay);
        }
      }
    } else {
      if (leftDet < left) {
        for (int i = leftDet; i <= left; i++) {
          analogWrite(L_R_PWM, i);
          // analogWrite(R_L_PWM, i);
          if (i < pinDelayLevel) {
            delay(pinDelay);
          }
        }
      }
      if (rightDet < right) {
        for (int i = rightDet; i <= right; i++) {
          analogWrite(R_L_PWM, i);
          // analogWrite(L_R_PWM, i);
          if (i < pinDelayLevel) {
            delay(pinDelay);
          }
        }
      }
    }
  }
}
```

Figure 3.5.1: Preprocessed images for robot controller

3.6 2023 May 1st to 31st

- During PP1, which occurred on the 22nd, we accomplished significant milestones in our project. Specifically, we completed the motor controlling algorithm, a crucial element for our project's functionality, and also made substantial progress in assembling the robot chassis. These achievements laid a solid foundation for the next phases of our project and were met with positive feedback during our presentation.

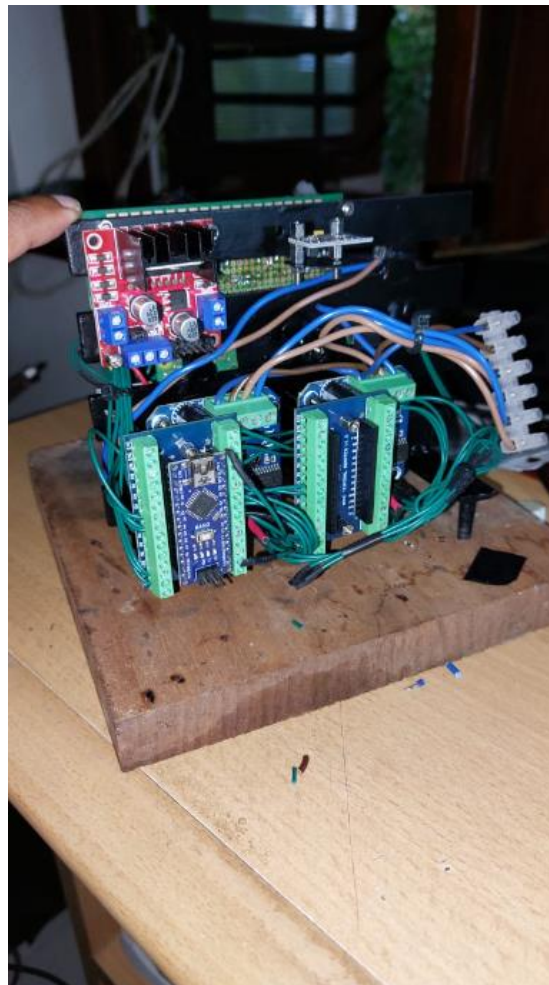


Figure 3.6.1: Robot hardware

3.7 2023 June 1st to 30st

- After the PP1 presentation the comments were viewed necessary adjustments were made
- The draft of the research paper was created and submitted.

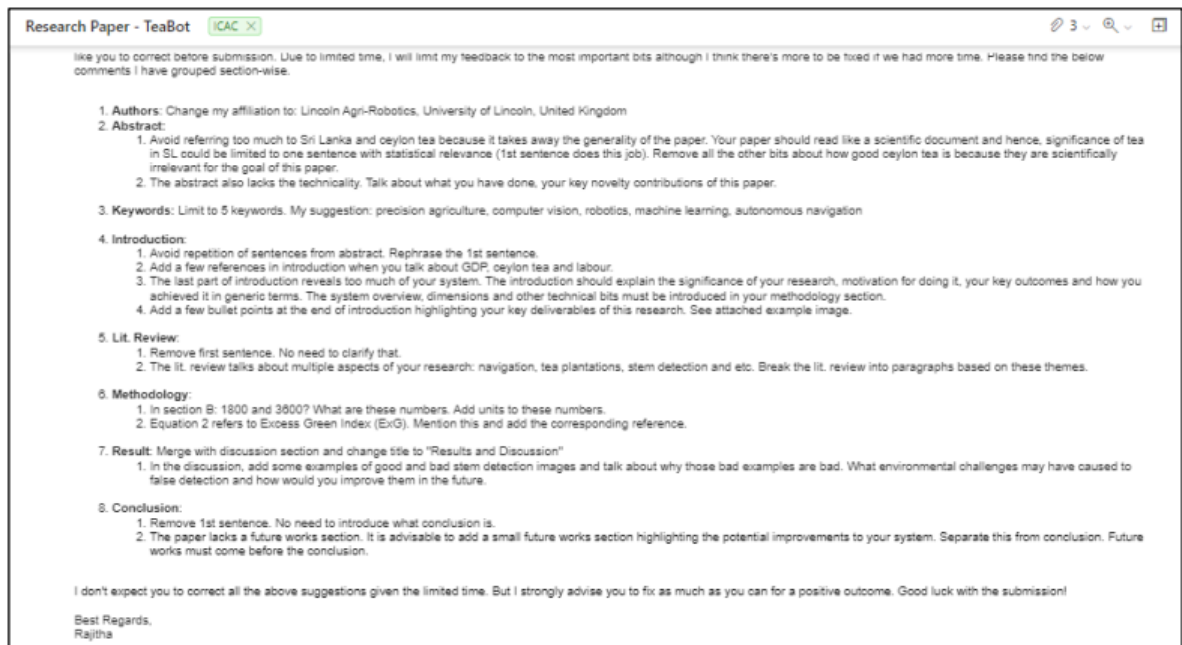
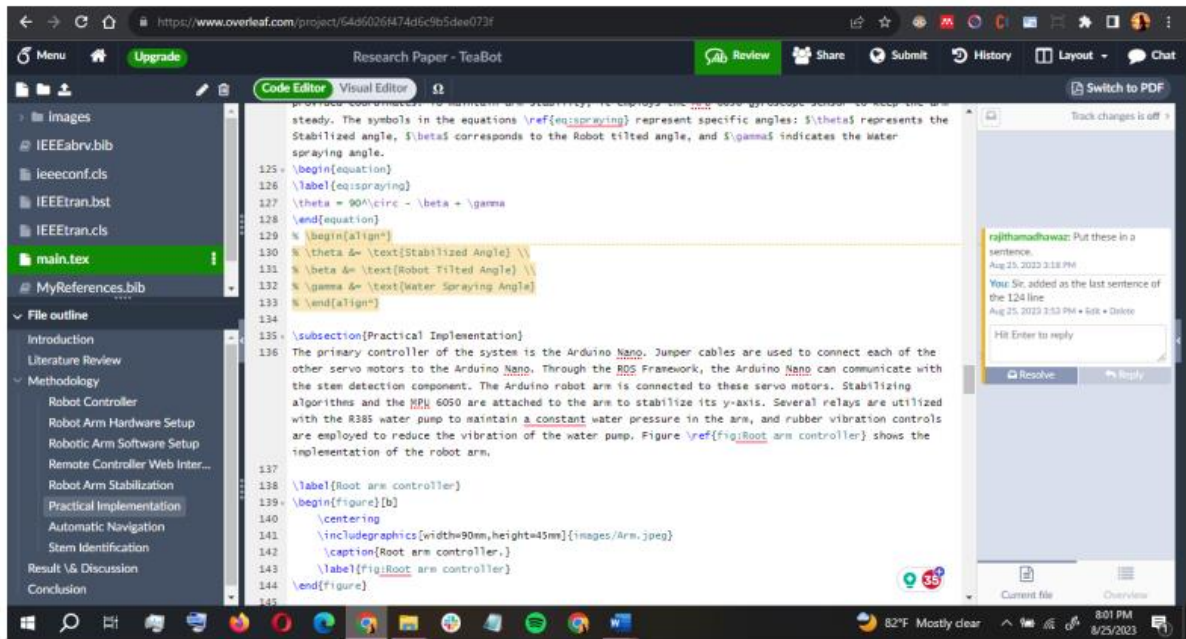


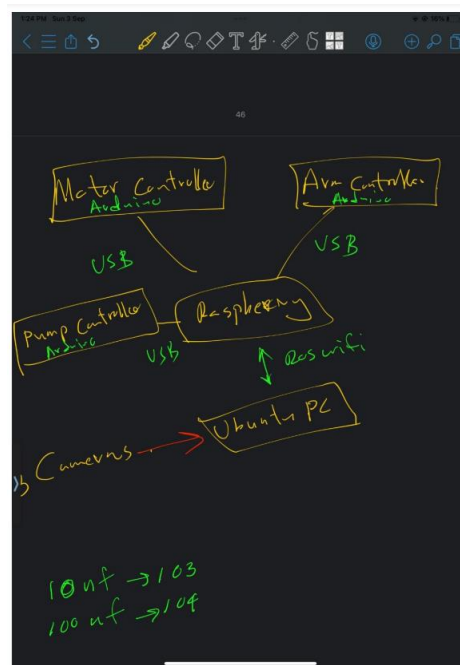
Figure 3.7.3: Written Research Paper

3.8 2023 July 1st to 31th

- On September 4th, we reached a significant milestone by submitting our second PP2. This report played a crucial role in keeping stakeholders informed about our project's current status and advancements, emphasizing the notable developments and successes we had attained.
- In the month of September, we dedicated our efforts to diligently crafting the final draft of our report, with the submission deadline set for September 10th. This comprehensive document encapsulated the culmination of our research endeavors, summarizing the entire project's journey from its initial stages to its successful completion.
- During the project's concluding phases, we undertook the integration stage, a pivotal element of our research process. Within this phase, we unified all project components and executed extensive testing within a real-world setting. This enabled us to evaluate the functionality and effectiveness of the integrated system. Furthermore, we carried out essential optimizations to enhance the system's performance, guaranteeing its alignment with the desired standards and objectives. This meticulous testing and optimization phase played a vital role in achieving a successful and efficient project outcome.

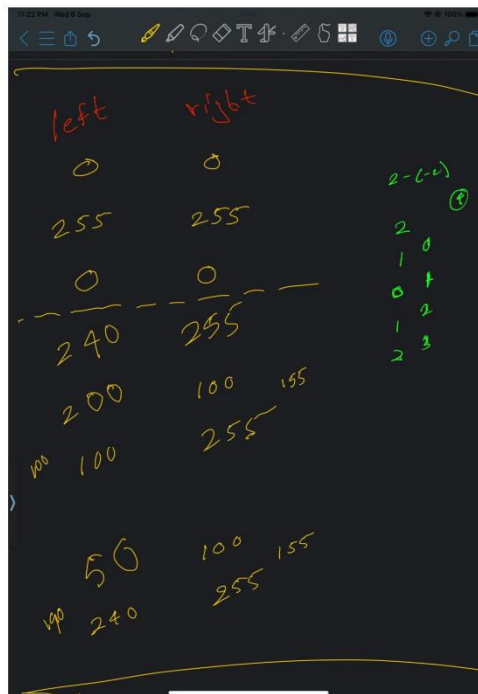
3.9 2023 August 1st 31st

- As our research project approached its conclusion, we allocated time to ready ourselves for the publication of our research paper. This involved the finalization of content, a meticulous review of the format, and the verification of the accuracy and completeness of all citations and references. Our objective was to share our findings and make a meaningful contribution to the wider scientific community through this publication.
- Additionally, we immersed ourselves in in-depth discussions regarding the prospective growth of the project. These dialogues encompassed the exploration of inventive concepts and approaches to elevate and broaden the scope of our achievements. We delved into possibilities for the project's evolution, the integration of emerging technologies, and strategies for overcoming any challenges or constraints we encountered during its course. The purpose of these discussions was to establish a robust groundwork for future research initiatives and enhancements, informed by the outcomes and insights gleaned from our project.



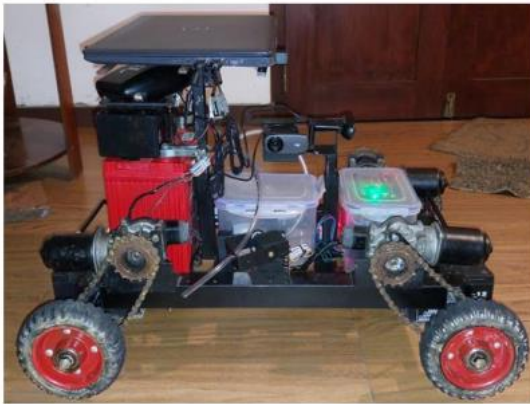
3.10 2023 September 1st to 31st

- On the 4th of the month, we conducted the viva for the PP2, which served as a crucial evaluation of our project's advancement and discoveries. This viva session provided us with the valuable opportunity to engage in an extensive dialogue with our supervisor, where we discussed and acted upon the guidance and feedback offered. These conversations played a pivotal role in honing our project and making the required refinements as we prepared for the final viva, ensuring that we presented our work in the most optimal way.
- In addition to the PP2 viva, we also drafted and submitted a Status Document-2 on the same date. This document functioned as a brief summary of our project's status and achievements up to that point, encapsulating our successes, milestones achieved, and any adjustments implemented in response to the feedback from the PP2 viva. It offered a snapshot of our project's advancement and contributed to the continuous documentation of our research expedition.



3.11 2023 October 1st to 31st

- Our research paper was completed and published.
- We practiced for the final viva which is scheduled on 31st October, and the optimization made for the robot controller and the end of the path detection component were presented during the viva.



3.12 2023 November 1st 15th

- The website is scheduled for submission on November 6th.
- The final report has undergone proofreading and will be turned in on the 27th.
- The research website has been sent to CDAP.

