

AI-Driven Detection and Mitigation of Urban Heat Island Effects Using Vision-Language Models

Project ID: R25-002

Logbook

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IT21802126

B.Sc. (Hons) Degree in Information Technology Specialized in
Information Technology

Department of Software Engineering

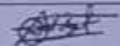
Sri Lanka Institute of Information Technology Sri Lanka

October 2025

DECLARATION


I declare that this is my own work and this dissertation I does not incorporate without acknowledgement any material previously submitted for a degree or Diploma in any other University or institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text.

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Name	Student ID	Signature
Silva G. M. S. S	IT21802126	

The supervisor/s should certify the LogBook with the following declaration.

The above candidate has carried out research for the bachelor's degree Dissertation under my supervision.


.....
Mr. Vishan Jayasinghearachchi
Supervisor

31/10/2023
.....
Date

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1. Work Progress

Week	Progress
November– 2024	
Week 1	<ul style="list-style-type: none"> • Began brainstorming possible research areas. • Discussed ideas such as coral-reef protection, IoT-based deforestation detection, and travel-planning systems. • Focused on identifying a project with both innovation and social impact.
Week 2	<ul style="list-style-type: none"> • Continued reviewing different domains and evaluating feasibility. • Compared environmental, social, and technical relevance of shortlisted topics. • Supervisor guided us to align ideas with sustainability and real-world application areas.
Week 3	<ul style="list-style-type: none"> • Shifted focus toward urban heating problems and the Urban Heat Island (UHI) effect. • Supervisor mentioned a colleague from University of Lincoln (UK) researching this field. • Learned how AI + IoT can help analyze and mitigate heat retention in cities.
Week 4	<ul style="list-style-type: none"> • Finalized UHI detection and mitigation as our main research topic. • Supervisor proposed collaborating with his Lincoln colleague as external supervisor and Ms. Kaushalya Rajapakse as co-supervisor. • Outlined research objectives and drafted the initial problem statement. • Prepared early documentation for proposal submission.
December – 2024	
Week 1	<ul style="list-style-type: none"> • Began preparing the TAF (Topic Assessment Form) document. • Collected background details, objectives, and expected outcomes for inclusion.
Week 2	<ul style="list-style-type: none"> • Held a meeting to plan our research schedule. • Decided to meet with supervisors every other week starting from January 2025 for progress reviews. • Began early reading on AI-based environmental analysis to prepare for proposal writing.
January – 2025	

Week 1	<ul style="list-style-type: none"> Started creating Charter and proposal. Met with the supervisor and co supervisor to obtain the signature for the charter document.
Week 2	<ul style="list-style-type: none"> Completed creating the proposal presentation
Week 3	<ul style="list-style-type: none"> Had our physical meeting to present the proposal presentation as trial run
Week 4	<ul style="list-style-type: none"> Did a proposal presentation. Submitted proposal report (final) to the CDAP cloud
February	
Week 1	<ul style="list-style-type: none"> Conducted a group meeting to discuss the proposal results and finalize individual component responsibilities. With the team, planned the structure of the AI-powered Urban Heat Island (UHI) detection and mitigation module.
Week 2	<ul style="list-style-type: none"> Gathered technical information about suitable machine learning models for UHI prediction. Faced difficulties understanding how to preprocess the metadata collected from image segmentation.
Week 3	<ul style="list-style-type: none"> Discussed these issues with supervisors and received guidance on data preprocessing and feature engineering. I identified the main input variables material type, surface area, temperature, and humidity.
Week 4	<ul style="list-style-type: none"> I started preparing the dataset by cleaning and encoding categorical features. Compared different regression algorithms to decide on suitable model architecture.
March	
Week 1	<ul style="list-style-type: none"> Showed the preprocessed dataset and early model plans to the supervisor. Supervisor suggested adding vegetation and heat-retaining surface ratios to improve prediction accuracy.
Week 2	<ul style="list-style-type: none"> Began implementing the logistic regression model using Python and scikit-learn. Conducted initial training and testing to establish baseline accuracy.
Week 3	<ul style="list-style-type: none"> Presented the initial accuracy results to supervisors and received feedback on improving model performance. Tuned hyperparameters use GridSearchCV to optimize model results.
Week 4	<ul style="list-style-type: none"> Continued refining the model and improved accuracy to above 94%. Started creating a simple Flask API endpoint for real-time prediction testing.
April	

Week 1	<ul style="list-style-type: none"> Prepared PowerPoint slides for Progress Presentation 1 highlighting the AI model and dataset design.
Week 2	<ul style="list-style-type: none"> Presented the progress (PP1) and explained the model's workflow and achieved accuracy.
Week 3	<ul style="list-style-type: none"> I conducted a team meeting to review PP1 feedback and discussed integration with IoT and VLM modules.
Week 4	<ul style="list-style-type: none"> I started developing a Gemini-based prompt template for generating mitigation suggestions. Collected reference prompts and sample outputs from literature for testing.
May	
Week 1	<ul style="list-style-type: none"> Improved dataset by adding humidity and temperature data from IoT readings. Visualized model outputs to check consistency with manual results.
Week 2	<ul style="list-style-type: none"> Met supervisor to discuss the Flask backend integration plan. Participated in the "How to Write a Research Paper" session to prepare for conference submission.
Week 3	<ul style="list-style-type: none"> Began developing the Flask backend API for UHI prediction (/predict endpoint). Connected it with the trained logistic regression model and scaler.
Week 4	<ul style="list-style-type: none"> Implemented the /recommend endpoint using Gemini for mitigation strategy generation. Tested both endpoints locally and validated their responses with sample data.
June	
Week 1	<ul style="list-style-type: none"> Continued the design and development of the web app frontend.
Week 2	<ul style="list-style-type: none"> Worked on integrating the AI backend with the React frontend. Tested real-time data flow from frontend to backend for predictions.
Week 3	<ul style="list-style-type: none"> Conducted comparative testing between manual and model results. Achieved an average deviation of ± 1.5 °C with ~94.5% overall accuracy.
Week 4	<ul style="list-style-type: none"> Refined the Gemini prompt for clearer and affordable recommendations. Discussed UI flow for showing model results and recommendations on the dashboard.
July	
Week 1	<ul style="list-style-type: none"> Designed improved JSON structure for storing model predictions and Gemini recommendations in Firebase.

Week 2	<ul style="list-style-type: none"> Began writing the group research paper, focusing on the AI model section and validation results. Reviewed existing academic papers related to AI-driven UHI detection for literature references.
Week 3	<ul style="list-style-type: none"> Sent our written research paper to the supervisor for checking.
Week 4	<ul style="list-style-type: none"> Met with supervisor for report signature and verification. Submitted final individual report to the CDAP and sent it for proofreading.
August	
Week 1	<ul style="list-style-type: none"> The supervisor confirmed our research paper for submission to the ICAC conference.
Week 2	<ul style="list-style-type: none"> Started writing the individual final report. Submitted our research paper to the ICAC conference.
Week 3	<ul style="list-style-type: none"> Conducted a group meeting to plan the PP2 presentation content and visual flow. Outlined integration flow for system demonstration.
Week 4	<ul style="list-style-type: none"> Met with the supervisor to obtain the signature for the final report. Completed individual final report and submitted to the CDAP. Final report was sent for proofreading.
September	
Week 1	<ul style="list-style-type: none"> Participated in team discussions to plan the PP2 slides. Prepared charts and validation tables showing model accuracy and difference rates between manual and predicted results.
Week 2	<ul style="list-style-type: none"> Presented the 90% completion at PP2, highlighting the model integration and Gemini reasoning output. Demonstrated prediction and recommendation modules successfully.
Week 3	<ul style="list-style-type: none"> Shared the panel comments with the supervisors Demonstrated how the algorithm worked to the supervisors Continued some integration work between the frontend and backend.
Week 4	<ul style="list-style-type: none"> Designed the project website section to host prediction results. Researched suitable cloud deployment strategies for Flask + Gemini integration.
October	
Week 1	<ul style="list-style-type: none"> Performed final system validation tests using real urban area images and IoT data. Verified model predictions in multiple zones including the tennis court (confirmed heat island presence).
Week 2	<ul style="list-style-type: none"> A research paper status mail was received from ICAC. Attending research discussion.

Week 3	<ul style="list-style-type: none"> • Deployed system to AWS. • Prepared final presentation • Created UI/UX Demo video • Applied to WSA Competition
Week 4	<ul style="list-style-type: none"> • Delivered final presentation demonstrating the complete AI-powered detection and mitigation system. • Showcased results accuracy, Gemini-based recommendations, and real-world validation outcomes.

2. Supervisor Meeting Logs

Date	Platform / Location	Remarks
Nov 21, 2024 (Thu)	Microsoft Teams	Initial group meeting after topic approval; clarified my role in developing the AI-based UHI detection and mitigation module.
Dec 5, 2024 (Thu)	Microsoft Teams	Reviewed draft TAF; supervisor feedback on objectives and feasibility.
Dec 18, 2024 (Wed)	Microsoft Teams	Progress check on proposal drafting; clarified scope of components.
Dec 19, 2024 (Thu)	Microsoft Teams	Finalized TAF submission and confirmed biweekly meetings from January.
Jan 2, 2025 (Thu)	Microsoft Teams	Discussed proposal structure and responsibilities for Charter document.
Jan 9, 2025 (Thu)	6th Floor, Main Building	Signed Charter; supervisor advised improvements for proposal presentation.
Jan 16, 2025 (Thu)	Microsoft Teams	Reviewed draft proposal slides; minor adjustments recommended.
Jan 23, 2025 (Thu)	6th Floor, Main Building	Trial run of proposal presentation; feedback on flow and clarity.
Jan 30, 2025 (Thu)	Microsoft Teams	Proposal preparation review; confirmed submission readiness.
Feb 6, 2025 (Thu)	6th Floor, Main Building	Discussed proposal results; planned system development schedule.
Feb 13, 2025 (Thu)	Microsoft Teams	Discussed proposal results and upcoming ML implementation timeline.
Feb 20, 2025 (Thu)	6th Floor, Main Building	Shared research on heat-retaining materials; planned preprocessing strategy for dataset.
Feb 27, 2025 (Thu)	Microsoft Teams	Follow-up on dataset preparation; began testing encoding methods in Python.
Mar 6, 2025 (Thu)	6th Floor, Main Building	Presented initial logistic-regression model; discussed accuracy improvement approaches.
Mar 13, 2025 (Thu)	Microsoft Teams	Discussed training issues and model imbalance; supervisor advised hyper-parameter tuning using GridSearchCV.
Mar 20, 2025 (Thu)	6th Floor, Main Building	Showed updated results (~94 % accuracy); feedback to add vegetation coverage feature.
Mar 27, 2025 (Thu)	Microsoft Teams	Prepared for Progress Presentation 1; checked slide content.
Apr 3, 2025 (Thu)	6th Floor, Main Building	Conducted mock PP1; feedback on presentation structure.
Apr 10, 2025 (Thu)	Microsoft Teams	Discussed PP1 feedback; planned to integrate Gemini for mitigation recommendation generation.
Apr 17, 2025 (Thu)	6th Floor, Main Building	Reviewed Gemini prompt examples; confirmed backend integration plan with Flask.
Apr 24, 2025 (Thu)	Microsoft Teams	Introduced Gemini-based prototype for mitigation suggestion

		testing.
May 1, 2025 (Thu)	6th Floor, Main Building	Presented updated dataset with vegetation index; discussed model consistency.
May 8, 2025 (Thu)	Microsoft Teams	Showed Flask API progress; supervisor gave feedback on JSON structure and output format.
May 15, 2025 (Thu)	6th Floor, Main Building	Supervisor checked frontend integration progress with AI backend.
May 22, 2025 (Thu)	Microsoft Teams	Demonstrated model inference through React frontend; planned data visualization of predictions.
May 29, 2025 (Thu)	6th Floor, Main Building	Reviewed backend error handling; confirmed addition of /recommend endpoint for Gemini.
Jun 5, 2025 (Thu)	Microsoft Teams	Supervisor reviewed model tuning and validation metrics; advised documenting accuracy comparisons.
Jun 12, 2025 (Thu)	6th Floor, Main Building	Discussed research paper draft and experiment validation.
Jun 19, 2025 (Thu)	Microsoft Teams	Feedback on paper structure and data representation.
Jun 26, 2025 (Thu)	6th Floor, Main Building	Reviewed experiment results; finalized paper content.
Jul 10, 2025 (Thu)	6th Floor, Main Building	Supervisor checked final draft before submission.
Jul 24, 2025 (Thu)	6th Floor, Main Building	Reviewed ICAC submission and progress on final report.
Aug 7, 2025 (Thu)	6th Floor, Main Building	Feedback on final report writing and PP2 preparation.
Aug 21, 2025 (Thu)	6th Floor, Main Building	Reviewed final submission; confirmed proofreading stage.
Aug 21, 2025 (Thu)	Microsoft Teams	Final sync-up before submission; confirmed deadlines.
Sep 4, 2025 (Thu)	Microsoft Teams	Discussed PP2 presentation slides and algorithm demonstration.
Sep 4, 2025 (Thu)	6th Floor, Main Building	Conducted PP2 dry run and gathered feedback.
Sep 18, 2025 (Thu)	Microsoft Teams	Discussed panel feedback and refined API-frontend integration.
Oct 16, 2025 (Thu)	Microsoft Teams	Final presentation rehearsal; updated validation findings and AWS deployment confirmation.

3. Meeting Notes

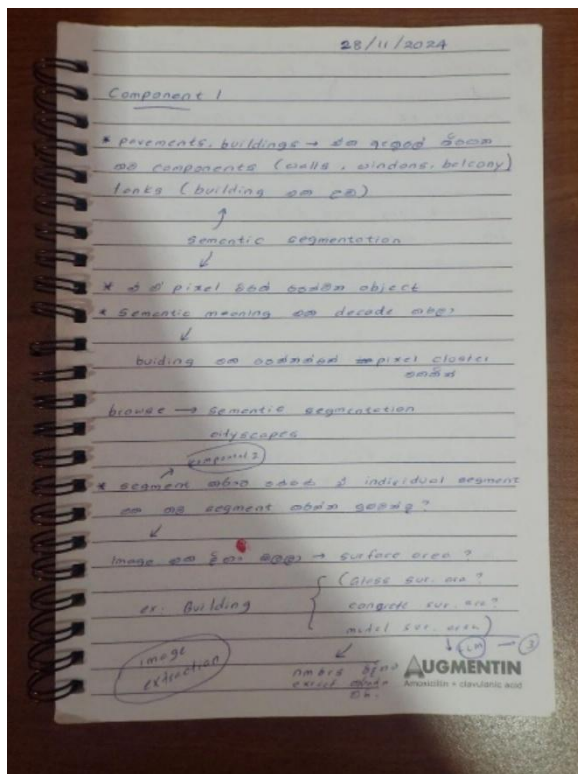


Figure 1: Note 1

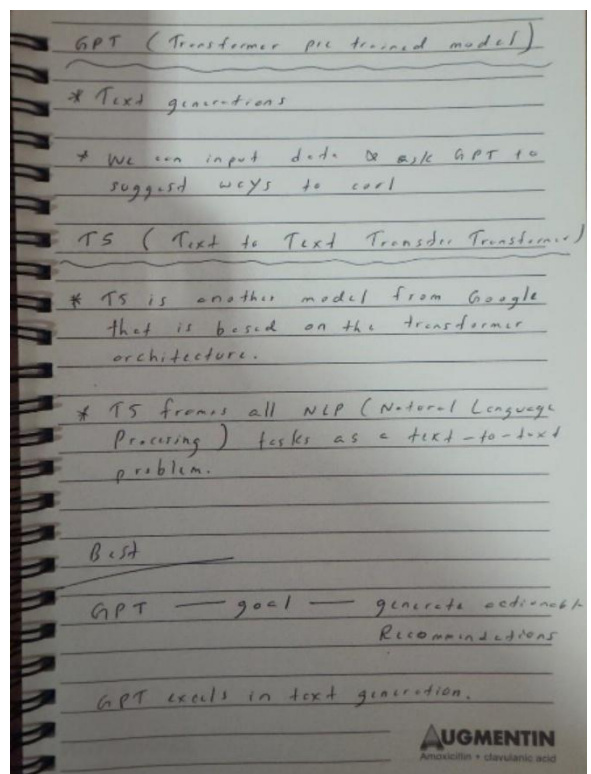


Figure 2: Note 2

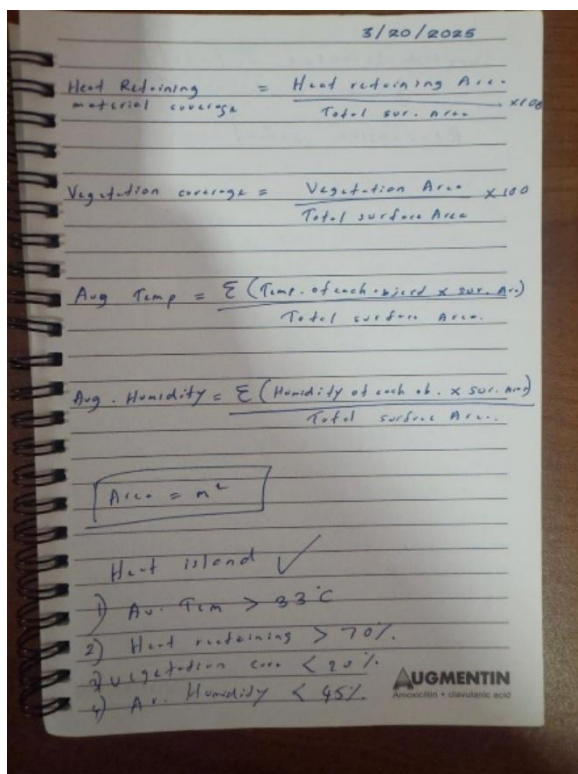


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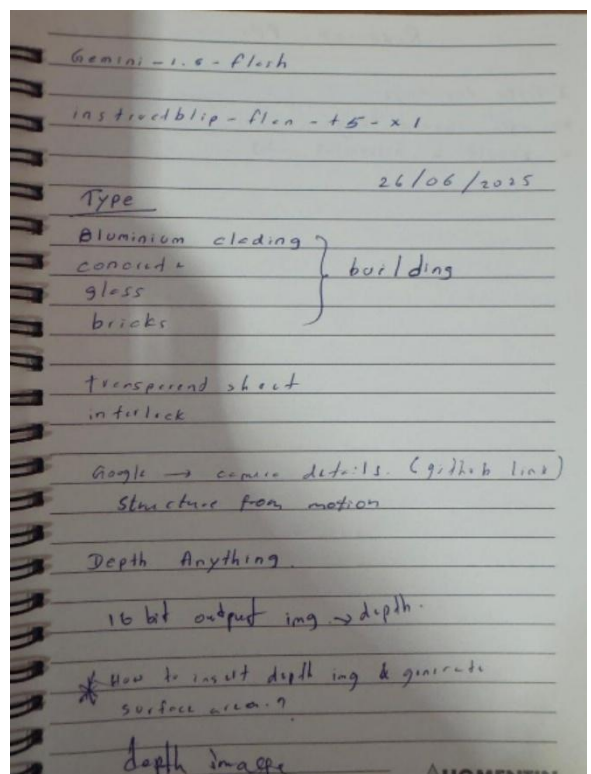


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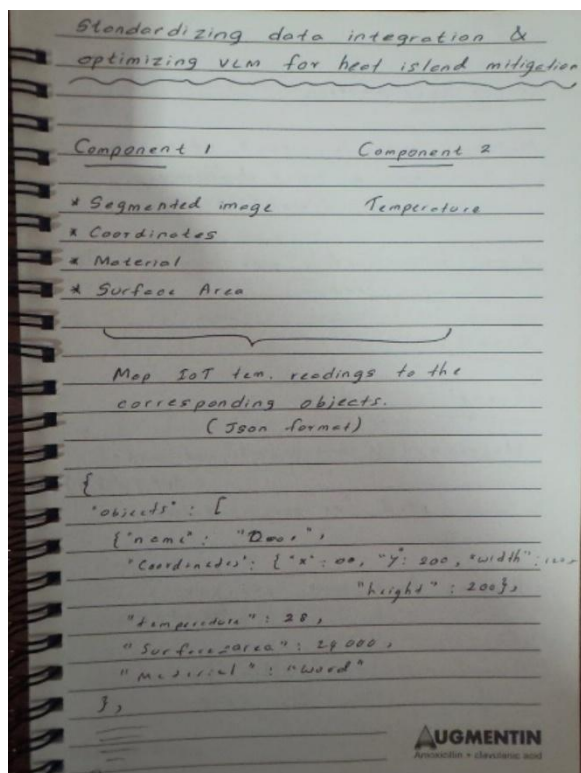


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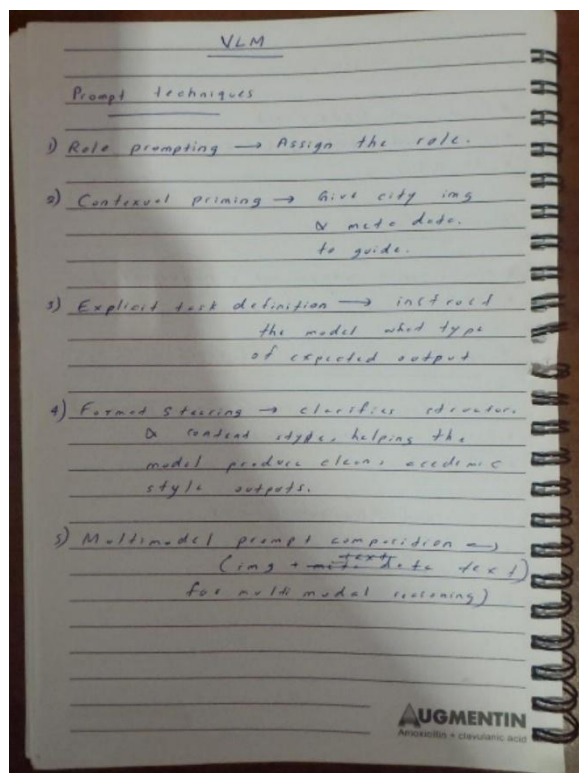


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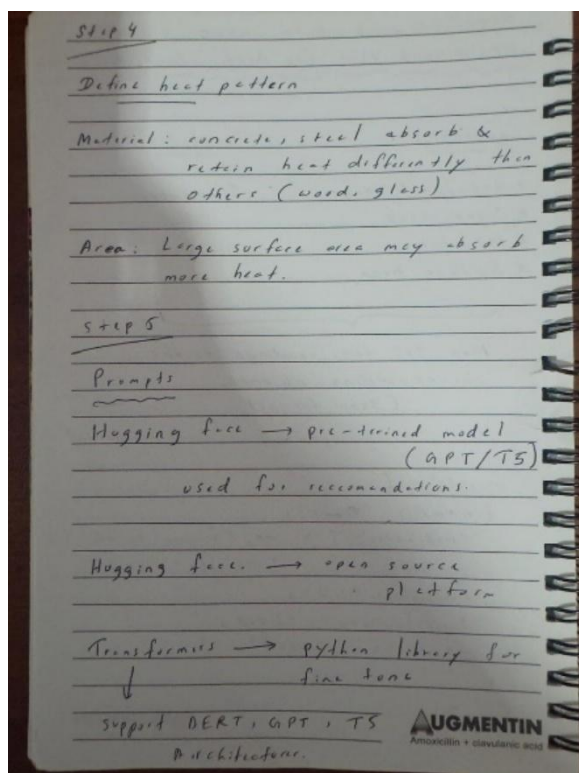


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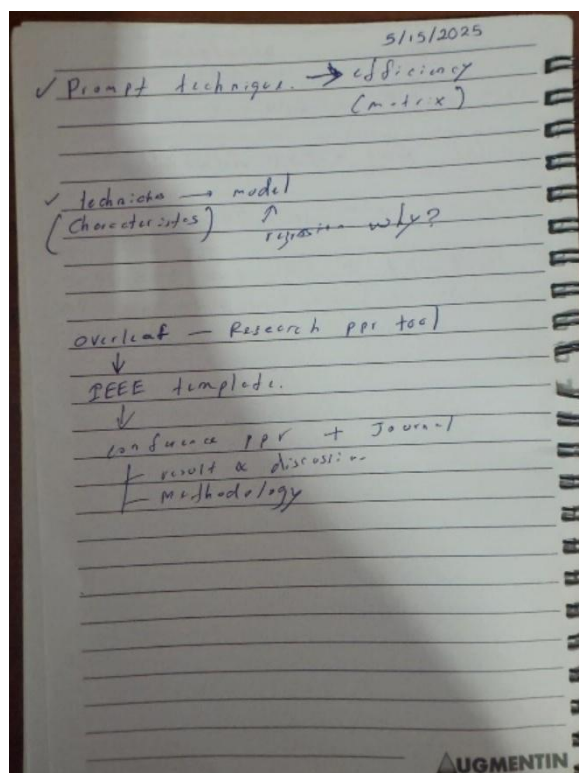


Figure 8 : Note 8

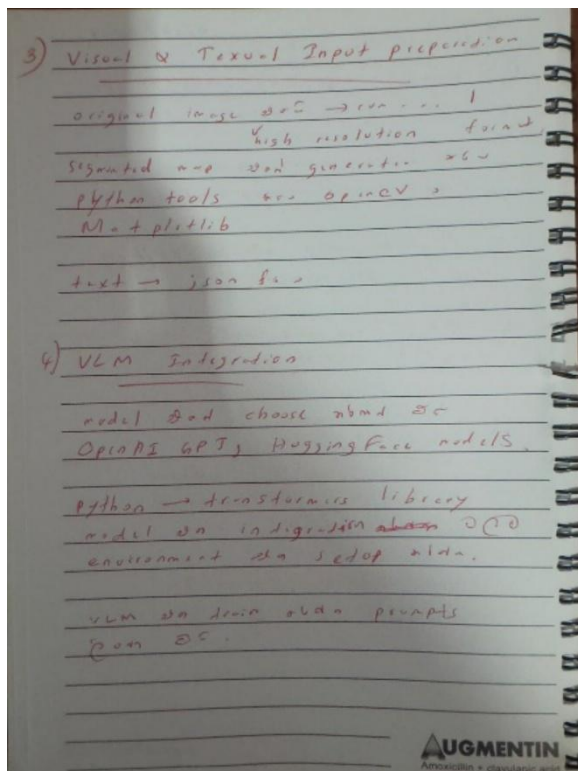


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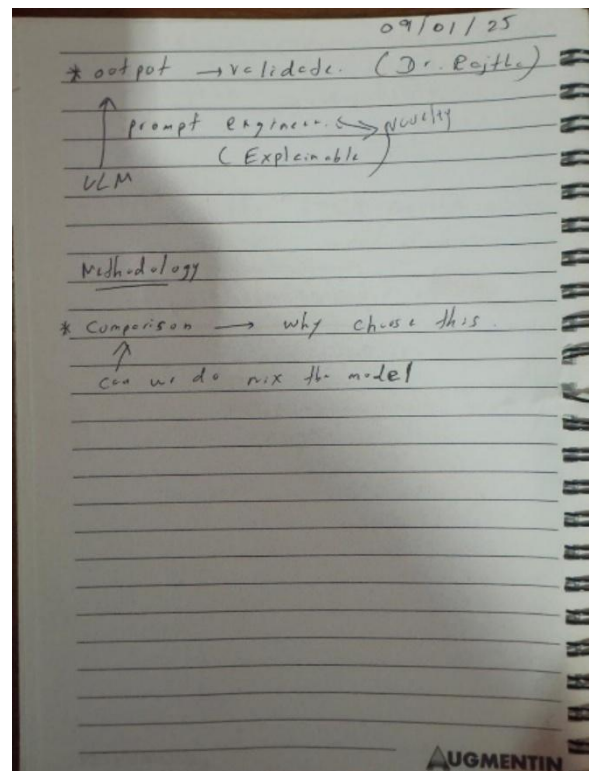


Figure 10 : Note 10

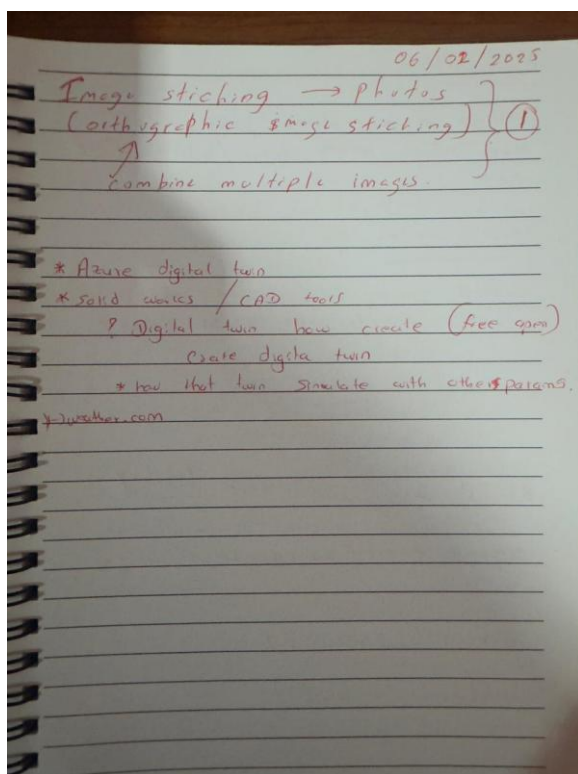


Figure 11 : Note 11

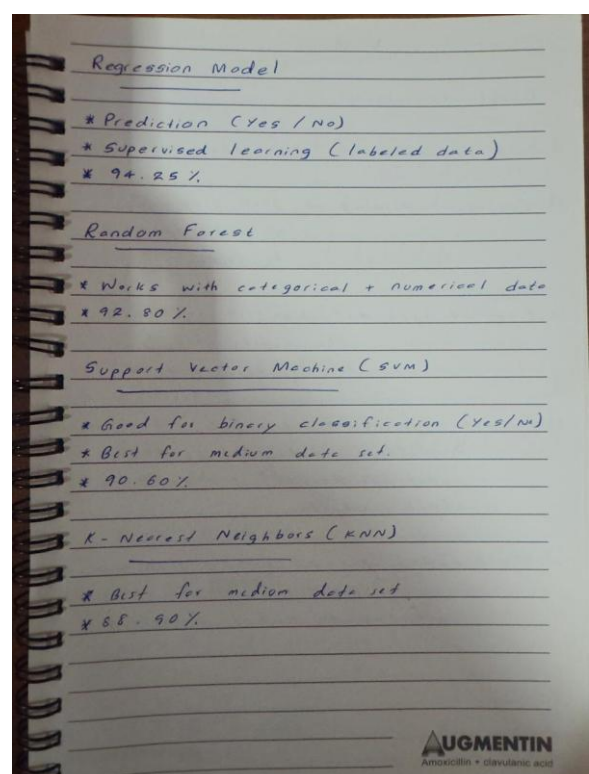


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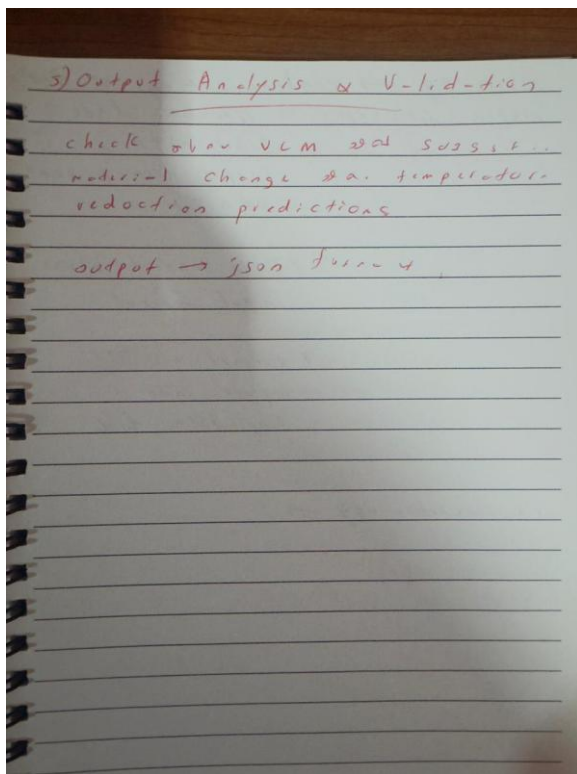


Figure 13 : Note 13

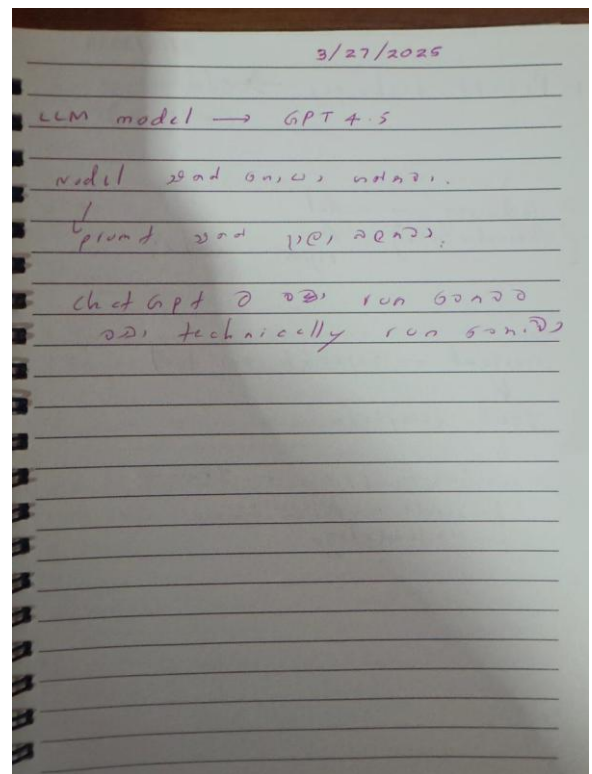


Figure 14 : Note 14

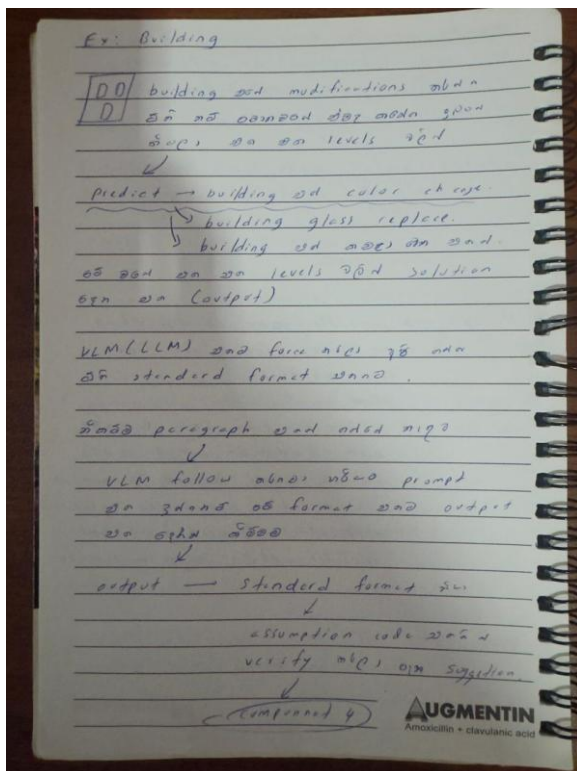


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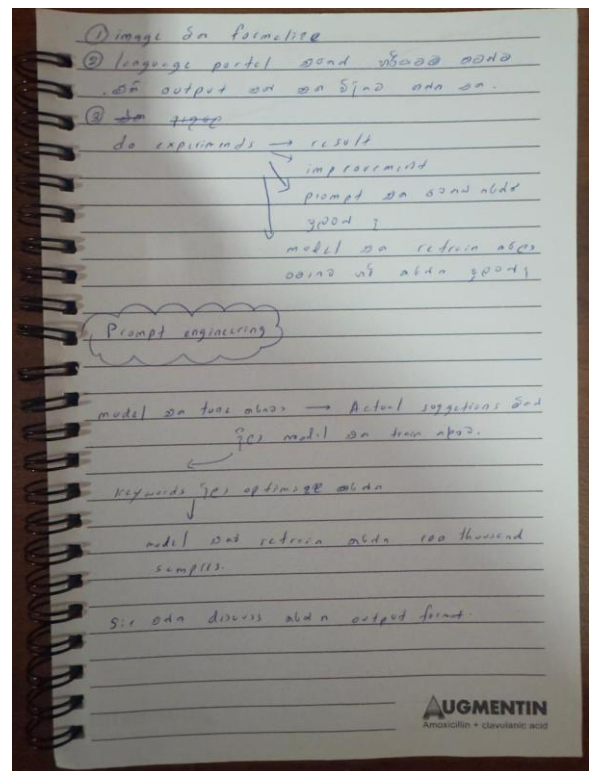


Figure 16 : Note 16

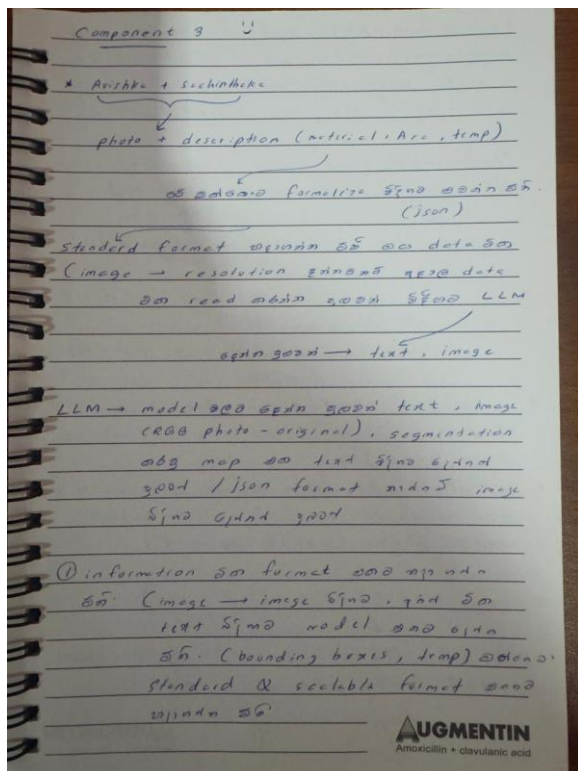


Figure 20 : Note 17

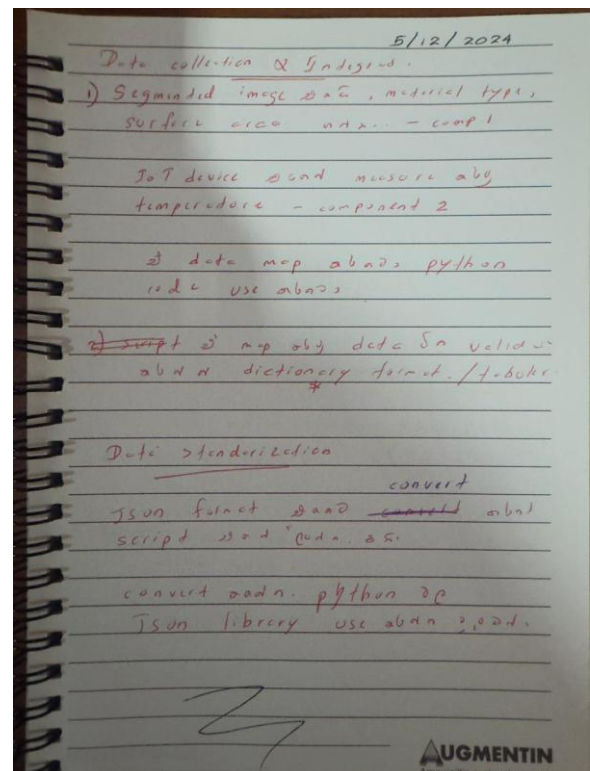


Figure 19 : Note 18

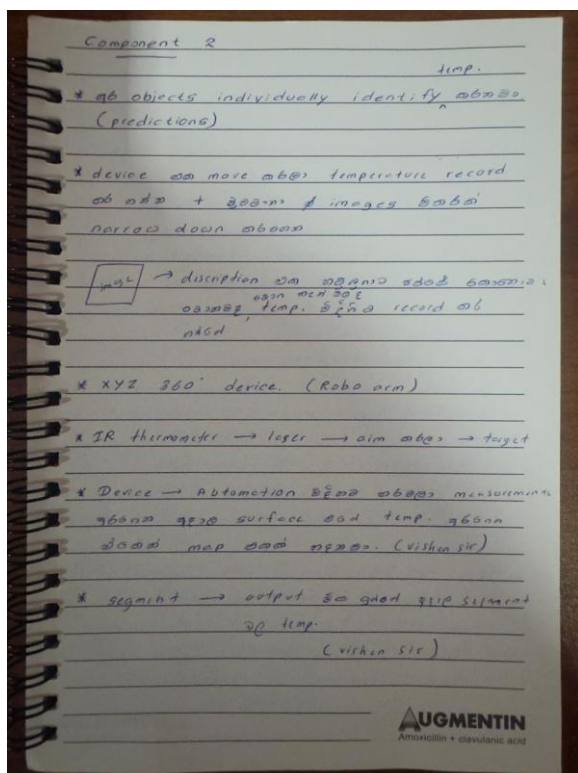


Figure 18 : Note 19

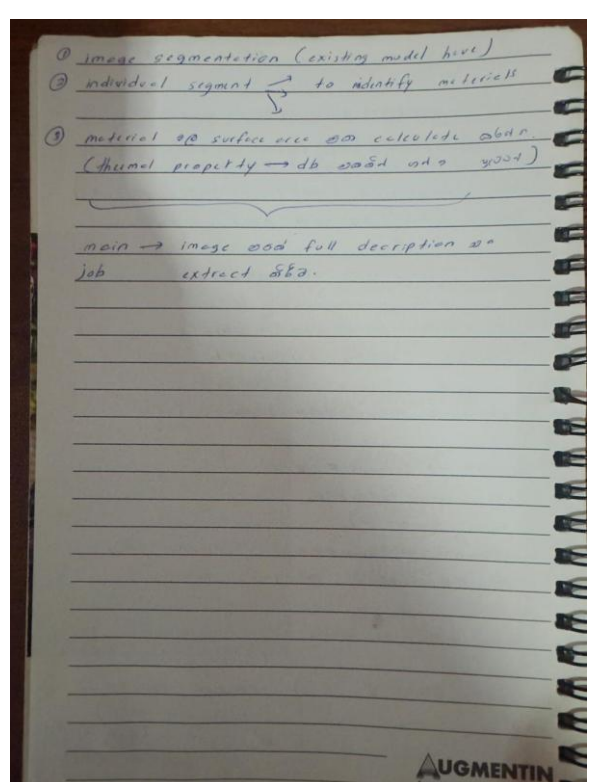


Figure 17 : Note 20

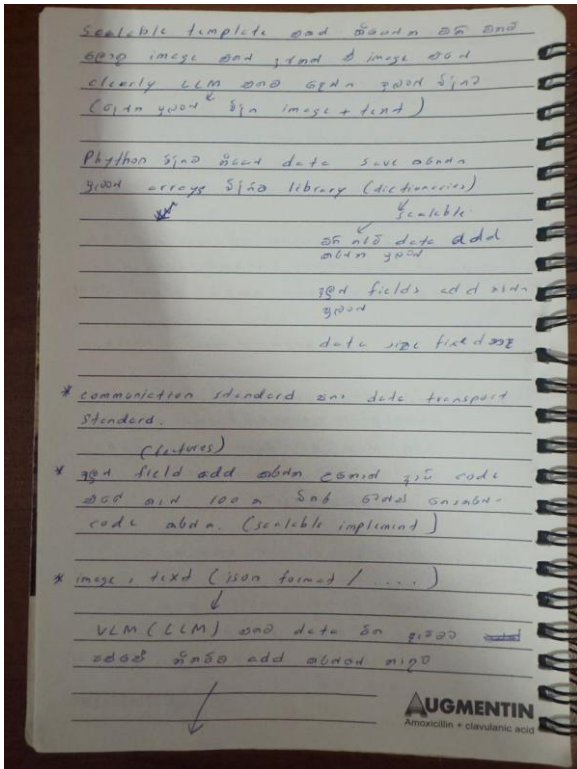


Figure 21 : Note 21

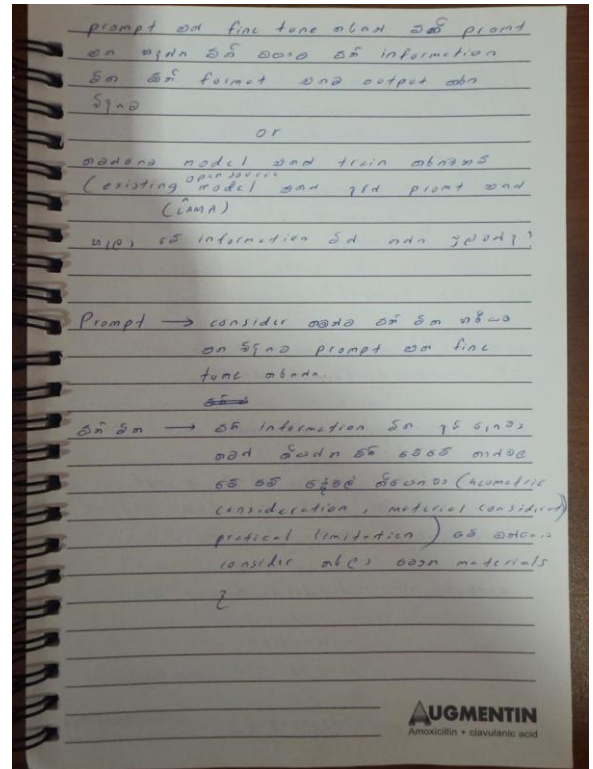


Figure 22 : Note 22

4. Git Activity History

SLIIT-R25-002 / HeatScape

Code Issues Pull requests Actions Projects Security Insights Settings

HeatScape (Public)

Edit Pins Watch 0 Fork 0 Star 0

main 1 Branch 0 Tags

Go to file Add file Code

IT21802058 Update uhi-simulation-service 90c9e5f · 3 days ago 167 Commits

Commit	Message	Time
idea	website updated	last week
App @ 6282328	Update App	2 months ago
Frontend @ b4b32db	Update Frontend	3 days ago
Website @ ddd4b43	final	3 days ago
image-processing-service @ 0cf4279	final	3 days ago
iot-localization-service @ 76baa41	Update iot-localization-service	3 days ago
uhi-simulation-service @ f62280a	Update uhi-simulation-service	3 days ago
vlm-solution-service @ 833c660	deploy	3 days ago
.env.template	Add UHI Simulation Service to Docker setup	last month
.gitignore	Add initial Docker setup and management scripts	2 months ago
gitmodules	added website	last week
DOCKER_README.md	Simplify Docker setup for development use	last month

About

No description, website, or topics provided.

Readme
 MIT license
 Activity
 Custom properties
 0 stars
 0 watching
 0 forks
 Report repository

Releases

No releases published
[Create a new release](#)

Packages

No packages published
[Publish your first package](#)

Contributors 5

Figure 23 : Git Repo

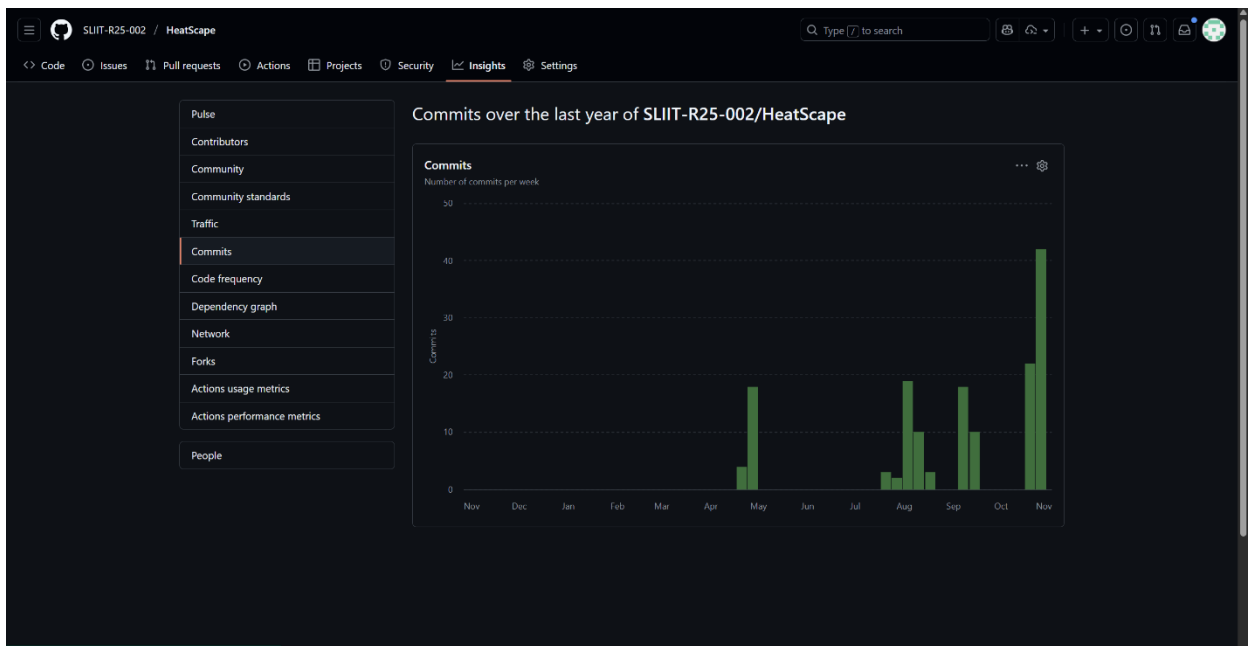


Figure 24 : Git Code Commits (Main Repo)

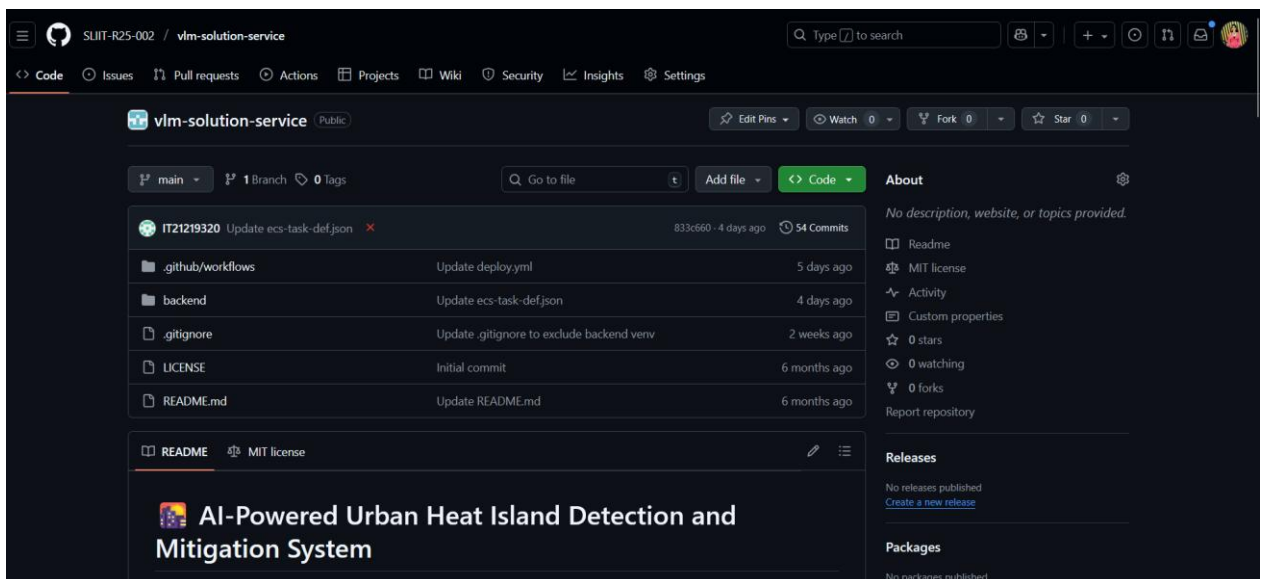


Figure 25 : Git Repo (VLM Microservice)

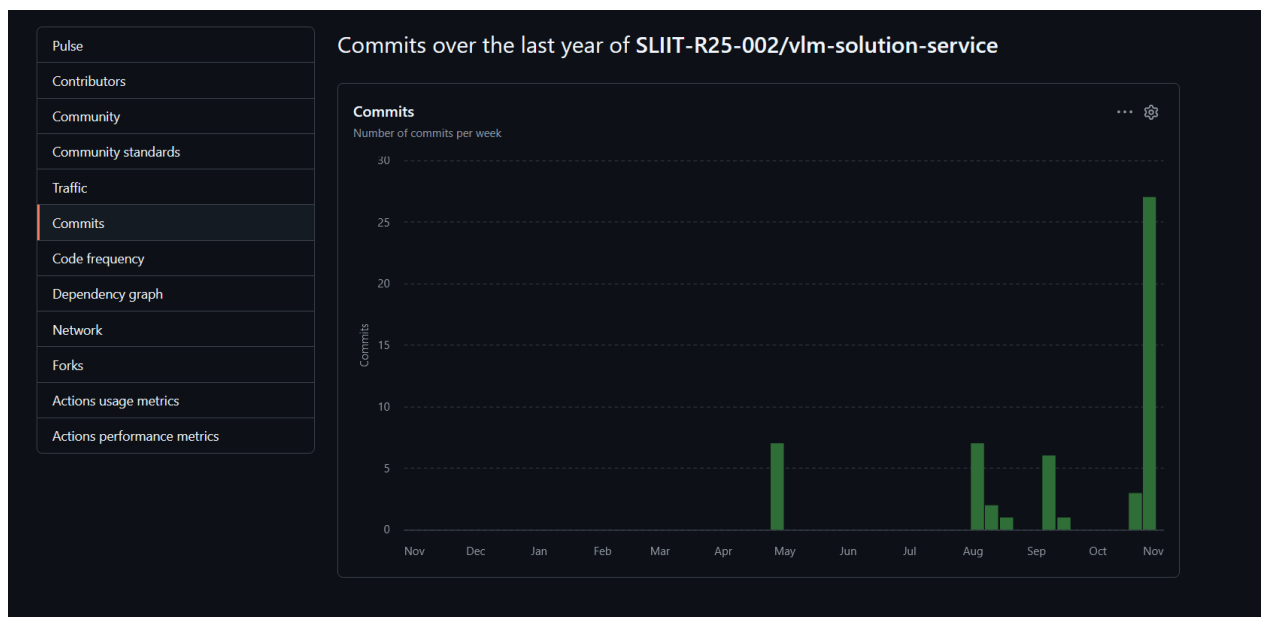


Figure 26 : Git Code Commits (VLM Microservice)

5. Screenshots of Meetings & Mails

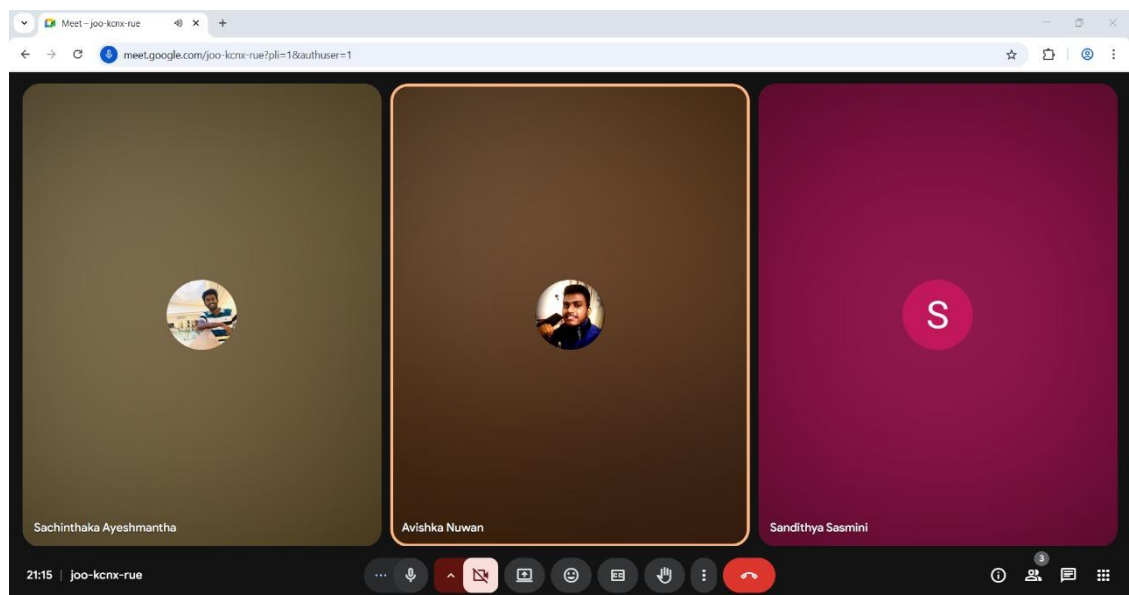


Figure 27 : Group Meeting

<input type="checkbox"/> ☆ Vishan Jayasinghear. 2	Inbox Canceled: Heat Island Research Meeting - On campus - Vishan Jayasinghearachchi. Microsoft Teams Need help? Join the meeting now. Meeting ID: 434 846 534 662 3. Passcode: P38cs9NU Canceled: Heat ... +2	Oct 28
<input type="checkbox"/> ☆ me, Rajit., Vishan 11	Inbox Heat Island Effect Research Paper Review - Cc: Vishan Jayasinghearachchi Subject: Re: Heat Island Effect Research Paper Review, [EXTERNAL EMAIL] This email has been received ...	Oct 21
<input type="checkbox"/> ☆ me, Vishan, Rajitha 3	Inbox Research paper acceptance update - To: Vishan Jayasinghearachchi; Rajitha De Silva; Kaushalya Rajapakse	Oct 24
<input type="checkbox"/> ☆ Vishan Jayasinghear. 2	Inbox Regarding WSA Competition - On Mon, Oct 20, 2025 at 10:54 AM Vishan Jayasinghearachchi wrote: Dear Ayeshmantha, Yes. Can you come this Wednesday at 1.30pm?	Oct 20
<input type="checkbox"/> ☆ me, Vishan 3	Inbox Regarding WSA Competition - To: Vishan Jayasinghearachchi Cc: Kaushalya Rajapakse Subject: Regarding WSA Competition	Oct 20
<input type="checkbox"/> ☆ Rajitha, me, Vishan 4	Inbox Re: Heat Island Research Meeting - On campus - Cc: Vishan Jayasinghearachchi; Kaushalya Rajapakse Subject: Re: Heat Island Research Meeting - On campus	Oct 7
<input type="checkbox"/> ☆ Vishan Jayasinghear. 2	Inbox Regarding a Co-supervisor - To: Vishan Jayasinghearachchi Subject: Re: Regarding a Co-supervisor. Dear Sir., Could you please share Ms. Kaushalya's email ...	11/8/24
<input type="checkbox"/> ☆ Vishan Jayasinghear.	Inbox RE: Request for Supervision of Final Year Research Project - To: Vishan Jayasinghearachchi Cc: Kumara B.D.A.N it21256264; Silva.	9/23/24
<input type="checkbox"/> ☆ Vishan Jayasinghear.	Inbox Canceled: Heat Island Research Meeting - On campus - Vishan Jayasinghearachchi. Microsoft Teams Need help? Join the meeting now. Meeting ID: 434 846 534 662 3. Passcode: P38cs9NU	Oct 7
<input type="checkbox"/> ☆ Vishan Jayasinghear.	Inbox Canceled: Heat Island Research Meeting - Vishan Jayasinghearachchi. Microsoft Teams Need help? Join the meeting now. Meeting ID: 458 207 215 391. Passcode: Vt9zM7ui	12/11/24
<input type="checkbox"/> ☆ Vishan Jayasinghear.	Inbox Heat Island Research Meeting - Vishan Jayasinghearachchi. Disclaimer : This email and any attachment transmitted herewith are confidential and is intended solely for the use of the ...	12/10/24
<input type="checkbox"/> ☆ Vishan Jayasinghear.	Inbox Canceled: Heat Island Research Meeting - On campus - Vishan Jayasinghearachchi. Microsoft Teams Need help? Join the meeting now. Meeting ID: 434 846 534 662 3. Passcode: P38cs9NU	Oct 2
<input checked="" type="checkbox"/> ☆ Vishan Jayasinghear. 3	Inbox Heat Island Research Meeting - On campus - Vishan Jayasinghearachchi. Microsoft Teams Need help? Join the meeting now. Meeting ID: 434 846 534 662 3. Passcode: P38cs9NU Canceled: Heat ... +3	
<input type="checkbox"/> ☆ me	New research paper for ICITR Conference - Dear Sir., As we discussed over the phone, I have completed and attached the new research paper for the IoT component of our project. IoT-Based Mobi...	Sep 30

Figure 28 : Emails 1

<input type="checkbox"/> ☆ me, Rajitha, Vishan 6	Inbox Regarding ICAC Submission - From: it21219320 Ayeshmantha S.K.S Sent: Wednesday, August 20, 2025 2:25 AM To: Rajitha De Silva Cc: Vishan Jayasinghearachchi; Kaushalya Rajapakse ... image.png +2	Aug 20
<input type="checkbox"/> ☆ me, Vishan 2	Inbox Progress Presentation 2 Update - To: Vishan Jayasinghearachchi Cc: Kaushalya Rajapakse; Rajitha De Silva	Sep 19
<input type="checkbox"/> ☆ me, Vishan, Rajitha 3	Inbox Finalized research paper - To: Rajitha De Silva; Vishan Jayasinghearachchi Subject: Finalized research paper HeatScape - De...	Aug 25
<input type="checkbox"/> ☆ Vishan Jayasinghear.	Inbox Request for Supervision of Final Year Research Project - From: Ayeshmantha S.K.S it21219320 Sent: Monday, September 23, 2024 9:44 AM To: Vishan Jayasinghearachchi	9/24/24
<input type="checkbox"/> ☆ Vishan, me 2	Inbox Canceled: Heat Island Research Meeting - On campus - Vishan Jayasinghearachchi. Microsoft Teams Need help? Join the meeting now. Meeting ID: 434 846 534 662 3. Passcode: P38cs9NU	Sep 8
<input type="checkbox"/> ☆ me, Vishan, Kaushal. 4	Inbox Regarding research mid marks - From: Kaushalya Rajapakse Sent: 12 September 2025 17:00 To: Vishan Jayasinghearachchi; Ayeshmantha S.K.S it21219320 Subject: Re: Regarding research ...	Sep 12
<input type="checkbox"/> ☆ Vishan Jayasinghear. 3	Inbox Canceled: Heat Island Research Meeting - On campus - Dear all, Dr. Rajitha will join with our regular meeting online. I still prefer if the team members come for the meeting on campus.	Aug 21
<input type="checkbox"/> ☆ Vishan Jayasinghear.	Inbox Canceled: Heat Island Research Meeting - On campus - Best regards, Vishan Jayasinghearachchi. Microsoft Teams Need help? Join the meeting now Meeting ID: 434 846 534 662 3 Passcode: P38cs9NU	Aug 22
<input type="checkbox"/> ☆ me, Vishan 2	Inbox Academic Coach for DevQuest - To: Vishan Jayasinghearachchi Subject: Academic Coach for DevQuest, [EXTERNAL EMAIL] This email has been received from an external ...	Sep 1
<input type="checkbox"/> ☆ Vishan Jayasinghear. 2	Inbox FW: 🍌 Rajitha is ready to work with you on Heat Island Research Project in Notion - From: Ayeshmantha S.K.S it21219320 Sent: Thursday, November 21, 2024 11:46 AM To: Vishan Jayasinghearachchi Cc: ...	11/21/24
<input type="checkbox"/> ☆ Vishan Jayasinghear.	Inbox RE: Updated Draft of Research Paper for Review - To: Vishan Jayasinghearachchi Subject: Updated Draft of Research Paper for Review. Dear Sir., I hope you're doing well. HeatScape.pdf	Jun 26
<input type="checkbox"/> ☆ Vishan Jayasinghear.	Inbox Confirmation of Research Project Supervisor - To: Vishan Jayasinghearachchi Subject: Re: Confirmation of Research Project Supervisor. Dear Sir., Thank you for your response.	10/16/24
<input type="checkbox"/> ☆ Vishan Jayasinghear.	Inbox Heat Island Research Meeting - On campus - Dear all, Dr. Rajitha will join with our regular meeting online. I still prefer if the team members come for the meeting on campus.	Jul 24
<input type="checkbox"/> ☆ Vishan Jayasinghear.	Inbox Heat Island Research Meeting - On campus - Dear all, Dr. Rajitha will join with our regular meeting online. I still prefer if the team members come for the meeting on campus.	Jul 23
<input type="checkbox"/> Kaushalya Rajapakse	Inbox Re: Request for Co-Supervision of Final Year Research Project - From: Ayeshmantha S.K.S it21219320 Sent: 11 November 2024 12:49 To: Kaushalya Rajapakse Cc: Vishan Jayasinghearachchi; Silva.	11/11/24
<input type="checkbox"/> ☆ Vishan Jayasinghear.	Inbox Heat Island Research Meeting - On campus - Dear all, Pushing this meeting to 3.30 pm due to faculty board meetings. Best regards, Vishan Jayasinghearachchi. Time updated as discussed. nname nname +3	Mar 20

Figure 29 : Emails 2

<input type="checkbox"/> ☆ Vishan Jayasinghear. 4	Inbox Re: Confirmation of Research Project Supervisor - From: Ayesmantha S.K.S it21219320 Sent: Friday, September 27, 2024 9:46 PM To: Vishan Jayasinghearachchi Subject: Confirmation of Research Project ...	10/16/24
<input type="checkbox"/> ☆ Vishan Jayasinghear.	Inbox Tentative: Research Paper Review #2 - Disclaimer : This email and any attachment transmitted herewith are confidential and is intended solely for the use of the individual or entity to ...	Jul 29
<input type="checkbox"/> ☆ Vishan Jayasinghear. 2	Inbox Heat Island Research Meeting - Vishan Jayasinghearachchi . Microsoft Teams Need help? Join the meeting now. Meeting ID: 458 207 215 391. Passcode: Vt9zM7ui	Apr 11
<input type="checkbox"/> ☆ me, Rajitha 5	Inbox Research paper review - To: Rajitha De Silva ; Vishan Jayasinghearachchi Subject: Research paper review	Aug 19
<input type="checkbox"/> ☆ Vishan Jayasinghear.	Inbox Canceled: Heat Island Research Meeting - On campus - Canceling due to the May day holiday. Disclaimer : This email and any attachment transmitted herewith are confidential and is intended solely for the ...	Apr 30
<input type="checkbox"/> ☆ Vishan Jayasinghear.	Inbox Heat Island Research Meeting - On campus - Dear all, Moving the meeting to 2pm as requested. Microsoft Teams Need help? Join the meeting now. Meeting ID: 484 102 012 728. Passcode: we6uU9rz	May 28
<input type="checkbox"/> ☆ Vishan Jayasinghear.	Inbox Heat Island Research Meeting - On campus - Dear all, Dr. Rajitha will join with our regular meeting online. I still prefer if the team members come for the meeting on campus.	Apr 11
<input type="checkbox"/> ☆ Vishan Jayasinghear. 3	Inbox RP meeting - From: Ayesmantha S.K.S it21219320 Sent: Wednesday, November 6, 2024 3:59 PM To: Vishan Jayasinghearachchi Subject: Re: RP meeting Dear Sir, ...	11/6/24
<input type="checkbox"/> ☆ Vishan Jayasinghear. 2	Inbox Canceled: Heat Island Research Meeting - Vishan Jayasinghearachchi . Microsoft Teams Need help? Join the meeting now. Meeting ID: 458 207 215 391. Passcode: Vt9zM7ui	Apr 11
<input type="checkbox"/> ☆ Vishan Jayasinghear.	Inbox Heat Island Research Meeting - Best regards, Vishan Jayasinghearachchi . Microsoft Teams Need help? Join the meeting now Meeting ID: 458 207 215 391 Passcode: Vt9zM7ui	11/27/24
<input type="checkbox"/> ☆ Vishan Jayasinghear.	Inbox Heat Island Research Meeting - Best regards, Vishan Jayasinghearachchi . Microsoft Teams Need help? Join the meeting now Meeting ID: 458 207 215 391 Passcode: Vt9zM7ui	11/28/24
<input type="checkbox"/> ☆ Vishan Jayasinghear.	Inbox Re: Update on project proposal presentation - From: Ayesmantha S.K.S it21219320 Sent: Tuesday, January 28, 2025 11:14 AM To: Vishan Jayasinghearachchi Subject: Update on project proposal ...	Jan 29
<input type="checkbox"/> ☆ Vishan Jayasinghear.	Inbox Canceled: Heat Island Research Meeting - On campus - Dear all, Cancelling due to Poya holiday. Microsoft Teams Need help? Join the meeting now. Meeting ID: 484 102 012 728. Passcode: we6uU9rz	Jul 8
<input type="checkbox"/> ☆ Vishan Jayasinghear.	Inbox Heat Island Research Meeting - On campus - Disclaimer : This email and any attachment transmitted herewith are confidential and is intended solely for the use of the individual or entity to ...	Mar 20
<input type="checkbox"/> ☆ Vishan Jayasinghear.	Inbox Heat Island Research Meeting - Dear all, The meeting discuss the heat island research work as discussed. Best regards, Vishan Jayasinghearachchi . Microsoft Teams Need help?	11/18/24
<input type="checkbox"/> ☆ Vishan Jayasinghear.	Inbox Heat Island Research Meeting - Vishan Jayasinghearachchi . Microsoft Teams Need help? Join the meeting now. Meeting ID: 458 207 215 391. Passcode: Vt9zM7ui	11/21/24
<input type="checkbox"/> ☆ Vishan Jayasinghear.	Inbox Canceled: Heat Island Research Meeting - On campus - Canceling due to the examinations. Microsoft Teams Need help? Join the meeting now. Meeting ID: 484 102 012 728. Passcode: we6uU9rz	May 29
<input type="checkbox"/> ☆ Vishan Jayasinghear.	Inbox Heat Island Research Meeting - Vishan Jayasinghearachchi . Microsoft Teams Need help? Join the meeting now. Meeting ID: 458 207 215 391. Passcode: Vt9zM7ui	Jan 3
<input type="checkbox"/> ☆ Vishan Jayasinghear.	Inbox Heat Island Research Meeting - On campus - Vishan Jayasinghearachchi . Disclaimer : This email and any attachment transmitted herewith are confidential and is intended solely for the use of the ...	Jan 3
<input type="checkbox"/> ☆ Vishan Jayasinghear.	Inbox Re: Inquiry about meeting tomorrow - From: Ayesmantha S.K.S it21219320 Sent: Wednesday, April 2, 2025 4:37 PM To: Vishan Jayasinghearachchi Cc: Kaushalya Rajapakse Subject: Inquiry about ...	Apr 3

Figure 30 : Emails 3

<input type="checkbox"/> ☆ Vishan Jayasinghear.	Inbox RE: Reminder - Imagine Cup & Author List - vishan.j@slit.lk Subject: Reminder - Imagine Cup & Author List Hi Vishan Sir, Just a quick reminder from our last	Aug 11
<input type="checkbox"/> ☆ Rajitha, me 8	Inbox Re: Clarification on Daily Research Paper Discussion Sessions - vishan.j@slit.lk ; Kaushalya Rajapakse Subject: Re: Clarification on Daily Research	Jul 23
<input type="checkbox"/> ☆ Vishan Jayasinghear.	Inbox Article on creating digital twins - Dear Ayesmantha, Dhanushikan, This article provides a good overview of the process of developing a	Jul 14
<input type="checkbox"/> ☆ it21802058 Madhuwan.	Inbox Fwd: Clarification on Simulation Scope Regarding GIS Metadata Integration - vishan.j@slit.lk - Dear Dr. Rajitha and Mr. Vishan, I hope this message finds you well. I'm writing to clarify an	Jul 6
<input type="checkbox"/> ☆ Rajitha De Silva 2	Inbox Re: HeatScape Research Paper - vishan.j@slit.lk ; Kaushalya Rajapakse Subject: Re: HeatScape Research Paper	Jun 30
<input type="checkbox"/> ☆ Vishan Jayasinghear.	Inbox RE: Draft Research Paper - HeatScape - vishan.j@slit.lk Cc: Kaushalya Rajapakse Subject: Draft Research Paper - HeatScape	Jun 20
<input type="checkbox"/> ☆ Vishan, me 4	Inbox RE: Quick Clarification on Research Paper Scope - vishan.j@slit.lk wrote: > Dear Ayesmantha, > > I'm ok, can you kindly check with Dr. Rajitha? If so	May 27
<input type="checkbox"/> ☆ Vishan Jayasinghear.	Inbox Canceled: Heat Island Research Meeting - On campus - Cancelling due to new year holidays.	Apr 11
<input type="checkbox"/> ☆ Vishan Jayasinghear.	Inbox Canceled: Heat Island Research Meeting - On campus - Disclaimer : This email and any attachment transmitted herewith are confidential and is intended	Apr 3
<input type="checkbox"/> ☆ Vishan Jayasinghear. 2	Inbox RE: Heat Island Research Meeting - On campus - vishan.j@slit.lk ; Kumara BDAN it21256264 ; Silva.GMSS it21802126 <it21802126	Mar 10
<input type="checkbox"/> ☆ Vishan Jayasinghear.	Inbox Canceled: Heat Island Research Meeting - On campus - Dear all, I will be on leave tomorrow. Instead, I can give you time on Tuesday (11th March) around	Mar 5
<input type="checkbox"/> ☆ Vishan Jayasinghear.	Inbox Canceled: Heat Island Research Meeting - On campus - Disclaimer : This email and any attachment transmitted herewith are confidential and is intended	Feb 20
<input type="checkbox"/> ☆ Vishan Jayasinghear.	Inbox Heat Island Research Meeting - On campus - Time updated as discussed. Disclaimer : This email and any attachment transmitted herewith are	Jan 21
<input type="checkbox"/> ☆ Vishan Jayasinghear.	Inbox RE: Regarding the charter document - vishan.j@slit.lk Cc: Kaushalya Rajapakse Subject: Regarding the charter document	Jan 6
<input type="checkbox"/> ☆ Vishan Jayasinghear.	Inbox Heat Island Research Meeting - On campus - Disclaimer : This email and any attachment transmitted herewith are confidential and is intended	Jan 3
<input type="checkbox"/> ☆ Vishan Jayasinghear. 2	Inbox Re: Checking Availability on the 18th - https://www.epa.gov/heatislands/learn-about-heat-islands Best regards, Vishan Jayasinghearachchi From	11/18/24

Figure 31 : Emails 4

6. Gallery



Figure 34 : Validation Testing 1



Figure 32 : Validation Testing 2



Figure 33 : Validation Testing 3



Figure 35 : Final Presentation Completed