Sri Lanka Institute of Information Technology

ISP- (IE 3092)

Individual Assignment

Logbook

Submitted by:				
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Module In charge:	Mr. Deemantha.S Mr. Tharaniyawarma.k
Project Topic:	*Applying Machine Learning for Real-Time Security Threat Detection in Smart Homes.*
Date:	5th October 2024

Contents

1 Week 1

WEEK 1 - 26th August 2024 to 1st September 2024			
DAY	**WORKDONE**	**HOURS WORKED**	**REMARKS BY INTERNS**
Monday	Created the Logbook	2	
Tuesday	Project Kickoff Initial project planning and scheduling Reviewed project requirements and objectives	3	The initial planning phase went smoothly, and the project scope was clearly defined.
Wednesday	Researched On How to create and train a Machine learning Model	4	Mostly the scope is vast further studying is needed
Thursday	Researched on the Technologies and libraries that was planned to do with Research on smart home security threats Identified common vulnerabilities and attack patterns	4	Research revealed several critical vulnerabilities that will help shape the project's direction.
Friday	Day off		
Saturday	Finalized project scope Defined data requirements for machine learning models	1	Data requirements have been defined.
Sunday	Day off		
Remarks by Supervisor			
Field Supervisor Signature			
Date			

2 Week 2

WEEK 2 – 2nd September 2024 to 8th September 2024			
DAY	**WORKDONE**	**HOURS WORKED**	**REMARKS BY INTERNS**
Monday	Detailed review of machine learning algorithms for threat detection Chose algorithms to explore further	2	No issues so Far.
Tuesday	Day off		
Wednesday	Sourced datasets from OpenML and Kaggle for smart home environments Cleaned and preprocessed the datasets	3	Data sourcing went well, but some missing values need to be handled during preprocessing.
Thursday	Day off		
Friday	Day off		
Saturday	Started exploratory data analysis (EDA) on sensor data Identified data patterns and correlations	2	EDA revealed useful patterns that can aid in feature engineering. Was a faliure
Sunday	Developed initial machine learning model CNN-LSTM Architecture Tested model accuracy with a sample dataset	4	further tuning is required.
Remarks by Supervisor			
Field Supervisor Signature			
Date			

3 Week 3

WEEK 3 – 9th September 2024 to 15th September 2024			
DAY	**WORKDONE**	**HOURS WORKED**	**REMARKS BY INTERNS**
Monday	Found a dataset to use in action recognition by github.com/AlexanderMelde/SPHAR-Dataset/archive/1.0.zip named SPHAR It had the normal actions that can recognized, should be recognized by the surveillance	2	The problem was to combining/ amplify the system to use both datasets and make a one.
Tuesday	Action recognition was created to train the machine learning	4	No errors so far.
Wednesday	Try to combine both and try to figure	5	Process was tricky, the action prediction comes as wrong.
Thursday	Debugging the problems	2	Still the problem was tricky
Friday	Debugging the problems	1	No solutions so far
Saturday	Try to make something out of it to figure the rest of the model	3	Only the action model is working so try to minimize the scope
Sunday	Day off		
Remarks by Supervisor			
Field Supervisor Signature			
Date			

4   Week 4

WEEK 4 – 16th September 2024 to 22th September 2024			
DAY	**WORKDONE**	**HOURS WORKED**	**REMARKS BY INTERNS**
Monday	Worked on the frontend using C and qt GUI	2	It was a success
Tuesday	Try to use other motion or sensor related to make the model more accurate in predictions and surveillance	1	Frontend is functioning as expected with real-time data.
Wednesday	Experimented with additional motion sensors to improve model predictions and surveillance	2	Frontend is functioning as expected with real-time data.
Thursday	Day off		
Friday	Finalized the integration of action recognition features into the system	2	Integrated actions are now properly recognized.
Saturday	Day off		
Sunday	Day off		
Remarks by Supervisor			
Field Supervisor Signature			
Date			

5 Week 5

	WEEK 5 – 23rd September 2024 to 29th September 2024		
DAY	**WORKDONE**	**HOURS WORKED**	**REMARKS BY INTERNS**
Monday	Day off		
Tuesday	Conducted further testing on the integrated system and collected feedback from peers		Positive feedback: minor tweaks suggested. (ChatGPT, Gemini)
Wednesday	Reviewed project progress and identified areas needing more attention		Adjustments improved model responsiveness.
Thursday	Reviewed project progress and identified areas needing more attention		Focus on refining model performance is essential.
Friday	Continued adjustments and optimizations		Deadline is closing
Saturday	Prepared for system testing and validation		Prepared for system testing and validation
Sunday	Day off		
Remarks by Supervisor			
Field Supervisor Signature			
Date			

6 Week 6

	WEEK 6 – 30th September 2024 to 5th October 2024		
DAY	**WORKDONE**	**HOURS WORKED**	**REMARKS BY INTERNS**
Monday	Final system testing and validation Prepared performance metrics for review	1	System validation completed successfully, with metrics indicating high performance.
Tuesday	Addressed minor issues identified during testing	2	Feedback received and implemented. Minor adjustments made to the system.
Wednesday	Checking	3	Still the system is not working like the way planned to
Thursday	Finalizing	6	For the upload and presentation made some adjustments to show ML has improved the intrusion detection in smart homes
Friday	Finalizing Submitted the final project report	1	Final report submitted on time.
Saturday	Project Completed Partially		
Sunday	Project Completed Partially		
Remarks by Supervisor			
Field Supervisor Signature			
Date			