Sri Lanka Institute of Information Technology

ISP- (IE 3092)

PROJECT CHARTER

GROUP NUMBER		(will be assigned by the lecturer-in-charge)

PROJECT GROUP MEMBER DETAILS:

STUDENT NAME	STUDENT ID.	CONTACT NO.	EMAIL ADDRESS (SLIIT mail address)	SIGNATURE
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PROJECT TOPIC	Applying Machine Learning for Real-Time Security Threat Detection in Smart Homes

- PROJECT DETAILS

- Brief Description of proposed project:

Project Overview

The project is focused on enhancing the security of smart homes with machine learning. As smart homes become more common, they also become more vulnerable to various security threats such as unauthorized access and data breaches.

By developing a system that uses machine learning algorithms, this project aims to detect these threats in real-time, providing homeowners with a reliable way to protect their homes.

The system will be designed to integrate easily with existing smart home devices, offering real-time monitoring and alerts for any suspicious activity. It will continuously learn and adapt to new threats, ensuring that the security of the smart home remains robust over time.

Target Audience

- Homeowners with smart home setups.
- Manufacturers of smart home devices.
- Cybersecurity professionals focused on smart home security.
- Technology enthusiasts are interested in home automation and security.

- Identified Problem

Security Threats

- Unauthorized access
- Data breaches
- Privacy concerns

System Limitations

- Ineffective in dynamic environments
- Delays in detection and response

False Alarms

- Frequent false positives
- User desensitization to alerts

Real-Time Monitoring Challenges

- High data processing demands
- Difficulties integrating with diverse smart devices

Integration and Scalability Issues

- Compatibility problems with new devices
- Challenges in adapting to evolving security threats

- Proposed Solution

✓ Developing a machine learning-based system capable of real-time threat detection in smart homes**.**

This system will address the existing problems by:

- Reducing false alarms and improving threat detection precision.
- Enabling real-time processing for immediate threat response.
- Ensuring seamless integration with various smart home devices.
- Offering scalability to adapt to new devices and evolving threats.

Key Functionalities

- Real-Time Threat Detection
- Provide a dashboard for monitoring home security, viewing real-time alerts, reviewing detailed reports, and adjusting settings.
- Seamless integration with various smart home devices, with easy instructions for adding new devices.
- Regular updates to the machine learning model to stay current with new threats.
- Real-Time Alerts

Expected Benefits

- Enhanced Security
- Enhanced Convenience
- Energy Efficiency
- Scalability
- Providing homeowners with the assurance that their smart home is protected against evolving security risks.

- TIMELINE

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MILESTONE	***TASK***	***TIMELINE D/M/Y***
MILESOTNE 01	Topic Register	06/07/2024
MILESOTNE 02	Project Proposal Submission	07/07/2024
MILESOTNE 03	Project Charter Submission	11/07/2024
MILESOTNE 04	Review Paper	25/08/2024
MILESOTNE 05	Logbook Submission	05/10/2024
MILESOTNE 06	Project Final Report Submission	05/10/2024

- REFERENCE: (IEEE Format)

1) Smith and B. Johnson, "Understanding Smart Home Technologies," IEEE Consumer Electronics Magazine, vol. 6, no. 2, pp. 56-64, Apr. 2023.

2) E. Alpaydin, Introduction to Machine Learning, 4th ed., Cambridge, MA: MIT Press, 2021.

3) J. Doe, "A Study on Machine Learning in IoT Security," IEEE Internet of Things Journal, vol. 7, no. 5, pp. 4001-4015, Oct. 2022

4) M. Al-Rubaie and J. Deng, "Privacy-Preserving Machine Learning: Threats and Solutions," IEEE Security & Privacy, vol. 17, no. 2, pp. 49-57, Mar.-Apr. 2019.

5) S. Kulkarni and J. N. Dwivedi, "Edge Computing for AI-Enabled IoT Systems," IEEE Sensors Journal, vol. 21, no. 3, pp. 2396-2405, Feb. 2021.

6) L. Xing, "A User Identification Algorithm Based on User Behavior Analysis in Social Networks," IEEE Access, vol. 7, pp. 12345-12355, Mar. 2019.

7) K. R. Haynes and J. Hollon, "Automated Multi-Sensor Data Fusion Using the Unified Data Library," IEEE Transactions on Instrumentation and Measurement, vol. 70, no. 5, pp. 1-10, Jun. 2021.

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- EVALUVATOR COMMENTS
