CSE 543: Information Assurance and Security

Using Machine Learning to detect and classify Malware in IoT Systems

Group 14 Weekly Report - 2

Person prepared this report: All members of the group

Person approved this report: Amogh Manoj Joshi, Priyadarshini Venkatesan

Person submitted this report: Amogh Manoj Joshi

List of members

1. Amogh Manoj Joshi (Group Leader)
2. Priyadarshini Venkatesan (Deputy Leader)
3. Vignan Varma Chekuri
4. Venkata Karthik Reddy Peddireddy
5. Siva Priya Bollineni
6. Anusha Akuthota
7. Sarika Naidu Chirki
8. Ramya Thota

Meeting Notes

01/24/2023: [9:00 pm - 9:30 pm] [Mode: Virtual (Google Meet)]

- The group members summarized the papers they had read on using machine learning for improving IAS in IoT
- After some discussion, the group decided to focus their project along two themes: using machine learning to prevent intrusion attacks and detect malware in the system
- **Attendance:** All the members were present

01/28/2023: [7:00 pm - 7:30 pm] [Mode: Virtual (Google Meet)]

- After receiving the feedback on the project title and scope, the group conducted a meeting to discuss the next steps
- The focus of the course project was updated to identifying and detecting the types of malware present in the IoT system using machine learning
- The group members decided to read research papers focusing on the topic above. All the papers read by the members would be updated in the google sheet along with a short description of the paper
- **Attendance:** Amogh, Priyadarshini, Karthik, Vignan, Siva Priya, Anusha, Sarika
- **Absence:** Ramya

Tasks Summary

Task Number	Task Name	Description of Task	Member	Task Status
1	Literature Survey	The team summarized the papers on the topic “Using Machine Learning for improving IAS in IoT”	All the members of the group	Completed
2	Finalizing the Topic	Decided to work on “using machine learning to prevent intrusion attacks and detect malware in the system”	All the members of the group	Completed
3	Literature survey after feedback	The team decided to work on “ identifying and detecting the types of malware present in the IoT system using machine learning”.	All the members of the group	Ongoing
4	Documentation	All the members of the team read 1 or 2 journals on detecting the types of malware present in the IoT system by using machine learning.Further, made a brief summary on each of those papers.	All the members of the group	Ongoing

Task Progress

Task Name	Member	Date and time of Review	Reviewer(s)	Mode of Review	Review Conclusion	Recommended Action
1) Initial Literature survey	All the members of the group	01/24/2023	All the members of the group	Group Meeting	Satisfactory	Accepted
2) Finalizing the Topic	All the members of the group	01/25/2023	All the members of the group	Group Meeting	Satisfactory	Accepted
3) Literature survey after feedback	All the members of the group	01/26/2023	Amogh Joshi	Group Meeting	-	Ongoing
4) Documentation	All the members of the group	01/28/2023	Amogh Joshi	Group Meeting	-	Ongoing

Problems:

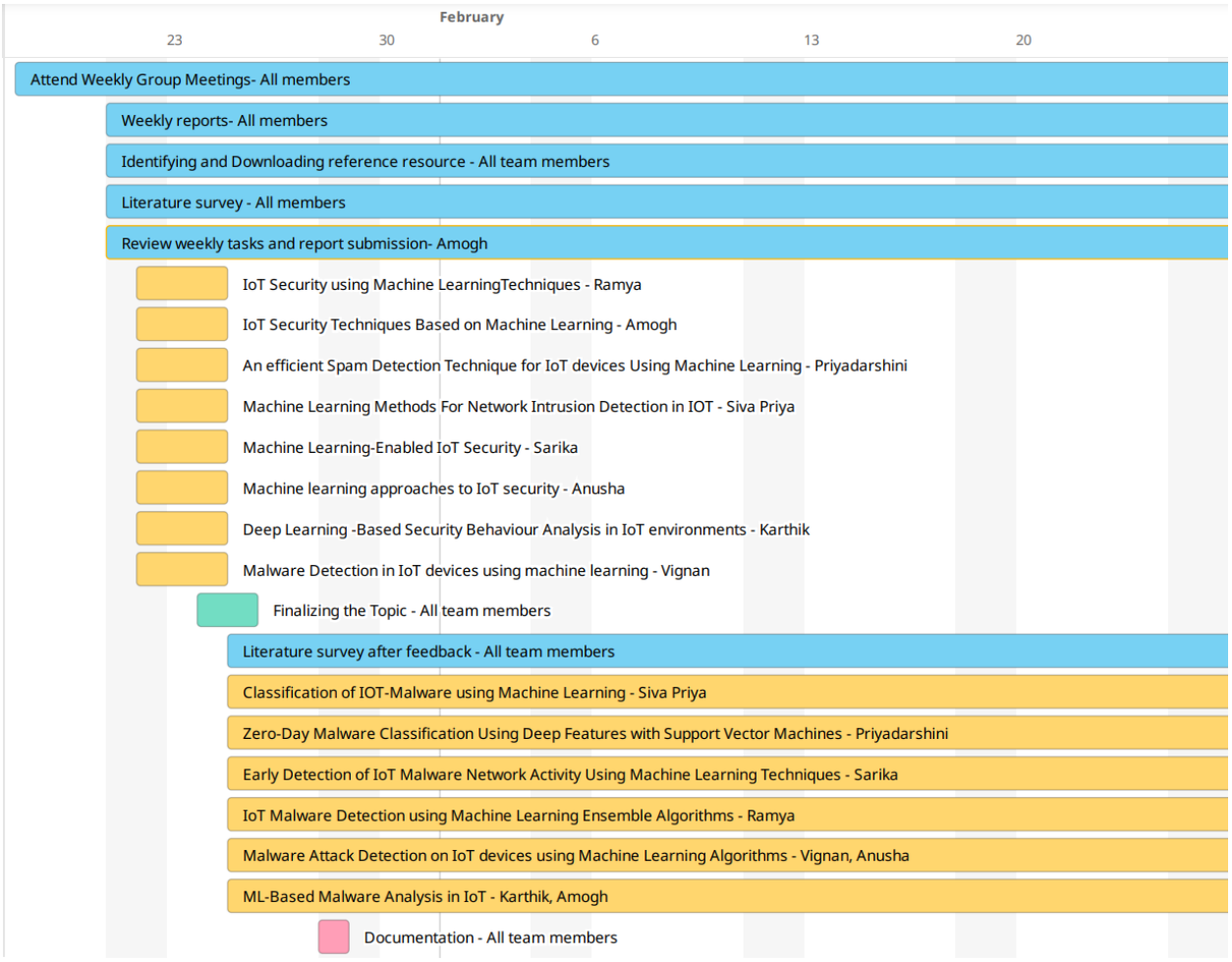
- **Faced by:** The entire team

  Status: Solved

  Problem: On receiving feedback from the professor and TA, we approached journals that highlighted the types of malware detection on IoT devices using Machine learning. We unwrapped the various techniques for the detection of the malware types. The team is addressing this issue by comprehending the journals.

Gantt Chart:

Link to Gantt Chart - here



References (focusing on the updated project topic):

1. F. Hussain, R. Hussain, S. A. Hassan and E. Hossain, "Machine Learning in IoT Security: Current Solutions and Future Challenges," in IEEE Communications Surveys & Tutorials, vol. 22, no. 3, pp. 1686-1721, thirdquarter 2020, doi: 10.1109/COMST.2020.2986444.
2. S. Madan and M. Singh, "Classification of IOT-Malware using Machine Learning," 2021 International Conference on Technological Advancements and Innovations (ICTAI), Tashkent, Uzbekistan, 2021, pp. 599-605, doi: 10.1109/ICTAI53825.2021.9673185.
3. R. El-Sayed, A. El-Ghamry, T. Gaber and A. E. Hassanien, "Zero-Day Malware Classification Using Deep Features with Support Vector Machines," 2021 Tenth International Conference on Intelligent Computing and Information Systems (ICICIS), Cairo, Egypt, 2021, pp. 311-317, doi: 10.1109/ICICIS52592.2021.9694256.
4. A. Kumar and T. J. Lim, "EDIMA: Early Detection of IoT Malware Network Activity Using Machine Learning Techniques," 2019 IEEE 5th World Forum on Internet of Things (WF-IoT), Limerick, Ireland, 2019, pp. 289-294, doi: 10.1109/WF-IoT.2019.8767194.
5. Santhadevi D, Janet B, “IoT Malware Detection using Machine Learning Ensemble Algorithms”, International Journal of Advanced Science and Technology (IJAST), vol. 29, no. 10s, pp. 8006-8016, Jun. 2020.
6. Achary, Rathnakar, and Chetan J. Shelke. "Malware Attack Detection on IoT Devices Using Machine Learning." In *Smart Data Intelligence: Proceedings of ICSMDI 2022*, pp. 11-22. Singapore: Springer Nature Singapore, 2022.