



CSE 543: Information Assurance and Security

Using Machine Learning to detect classifying Malware in IoT Systems

Group 14 Weekly Report - 8

Person prepared this report: All the members of the group

Person approved this report: Amogh Manoj Joshi

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

03/10/2023: [7:30 pm - 9:00 pm] [Mode: Virtual]

- The group members read 2 casual papers each during the spring break week as planned earlier
- A discussion meeting was conducted where each member was asked to share what he/she had learnt so far from the 4 papers (2 In-depth and 2 Casual papers)
- The motive of this exercise was to understand the topic better by sharing and knowing each other's learning curve
- **Attendance:** All the members were present

03/11/2023: [11:00 am - 12:00 pm] [Mode: Virtual]

- A short meeting was held by the group leader to discuss the plan of action for the coming week. Each member had read 4 papers by then.
- The group leader asked everyone to continue the literature review by reading another in-depth paper to ensure that no important paper in the domain was missed out. This would be the 3rd set of In-depth papers.
- The group planned to finish the study report of this paper set by 17th March, the member evaluation by 18th March and the final evaluation by 19th March
- After this paper set, the group will start gathering and organizing the information learnt so far and start writing the final report
- **Attendance:** All the members were present

Tasks Summary

Task Number	Task Name	Description of Task	Member	Task Status
1	Reading of 2 casual papers	All the members completed reading 2 casual papers	All Members	Done
2	Group Discussion	1. Discussed among the team about the papers read during the week. 2. Discussed on how to proceed further for the coming weeks - planning on when to start collaborating for the final report.	All Members	Done
3	Reading of 3rd Set of In Depth papers	The team started working on the next set, for the in-depth paper.	All Members	On-Going

Task Progress

Task Name	Member	Date and time of Review	Reviewer(s)	Mode of Review	Review Conclusion	Recommended Action
Reading of 2 casual papers	All Members	03/10/2023	All the members of the group	Group meeting	Satisfactory	Completed
Group Discussion	All Members	03/10/2023	All the members of the group	Group meeting	Satisfactory	Completed

Reading of 3rd Set of In Depth papers	All Members	03/11/2023	All the members of the group	Group meeting	Needs work	Ongoing
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Problems:

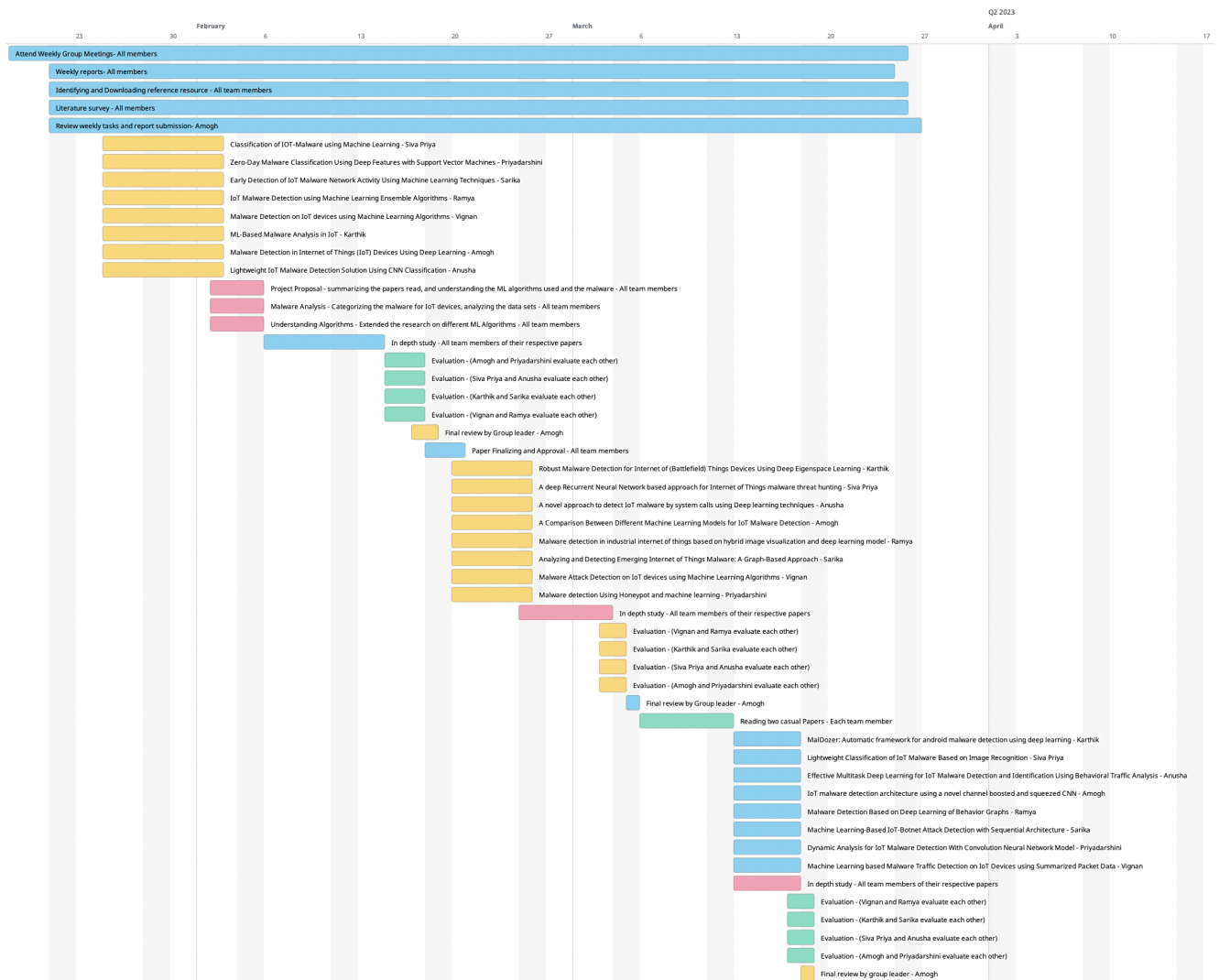
Faced by: All Team Members

Status: Solved

Problem: As a team, comprehending and analyzing from various journals to complete the 3rd In depth paper set.

Gantt Chart:

[Link to Gantt Chart](#)



References:

For complete list of all the in depth references and causal references please check the following link:(https://docs.google.com/spreadsheets/d/1hab4PAWxRHrmEo-6p4pZzyuUIFz8_H-qxlXJsQ3uvbU/edit#gid=0)

In Depth

- 1.J. Su, D. V. Vasconcellos, S. Prasad, D. Sgandurra, Y. Feng and K. Sakurai, "Lightweight Classification of IoT Malware Based on Image Recognition," 2018 IEEE 42nd Annual Computer Software and Applications Conference (COMPSAC), Tokyo, Japan, 2018, pp. 664-669, doi: 10.1109/COMPSAC.2018.10315.
- 2.ElMoataz Billah Karbab, Mourad Debbabi, Abdelouahid Derhab, Djedjiga Mouheb, MalDozer: Automatic framework for android malware detection using deep learning, Digital Investigation, Volume 24, Supplement, 2018, Pages S48-S59, ISSN 1742-2876, doi: <https://doi.org/10.1016/j.diin.2018.01.007>.
- 3.S. Ali, O. Abusabha, F. Ali, M. Imran and T. ABUHMED, "Effective Multitask Deep Learning for IoT Malware Detection and Identification Using Behavioral Traffic Analysis," in IEEE Transactions on Network and Service Management, 2022, doi: 10.1109/TNSM.2022.3200741.
- 4.J. Jeon, J. H. Park and Y. -S. Jeong, "Dynamic Analysis for IoT Malware Detection With Convolution Neural Network Model," in IEEE Access, vol. 8, pp. 96899-96911, 2020, doi: 10.1109/ACCESS.2020.2995887.
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- 6.Asam M, Khan SH, Akbar A, Bibi S, Jamal T, Khan A, Ghafoor U, Bhutta MR. IoT malware detection architecture using a novel channel boosted and squeezed CNN. Sci Rep. 2022 Sep 15;12(1):15498. doi: 10.1038/s41598-022-18936-9. PMID: 36109570; PMCID: PMC9477830.
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- 7.SOE, Yan Naung, FENG, Yaokai, SANTOSA, Paulus Insap, HARTANTO, Rudy, SAKURAI, Kouichi (2020): Machine Learning-Based IoT-Botnet Attack Detection with Sequential Architecture. *Sensors*, 20 (16), S. 4372 Online verfügbar unter: URL: <http://dx.doi.org/10.3390/s20164372>.

Casual

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2. J. Su, D. V. Vasconcellos, S. Prasad, D. Sgandurra, Y. Feng and K. Sakurai, "Lightweight Classification of IoT Malware Based on Image Recognition," 2018 IEEE 42nd Annual Computer Software and Applications Conference (COMPSAC), Tokyo, Japan, 2018, pp. 664-669, doi: 10.1109/COMPSAC.2018.10315.
3. S. Ali, O. Abusabha, F. Ali, M. Imran and T. ABUHMED, "Effective Multitask Deep Learning for IoT Malware Detection and Identification Using Behavioral Traffic Analysis," in IEEE Transactions on Network and Service Management, 2022, doi: 10.1109/TNSM.2022.3200741.
4. Riaz S, Latif S, Usman SM, Ullah SS, Algarni AD, Yasin A, Anwar A, Elmannai H, Hussain S. Malware Detection in Internet of Things (IoT) Devices Using Deep Learning. *Sensors*. 2022; 22(23):9305. <https://doi.org/10.3390/s22239305>.
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