

Detailed Plan to complete the project

Week 1: Project Initialization and Problem Statement

Day 1-2: Project Initialization

- Joined the project domain and formed a team of 2.
- Researched cloud security fundamentals (IaaS, PaaS, SaaS) and chose application security.
- Explored various aspects of cloud security including network security, application security, and storage security.

Day 3-4: Problem Statement

- Defined and finalized the problem statement focusing on cryptojacking detection for host-based environments in the cloud.

Day 5: Literature Review Initiation

- Started researching cryptojacking and existing detection methods for host-based environments in the cloud.

Week 2: In-depth Research and System Design

Day 1: Cryptojacking Research

- Conducted detailed research on cryptojacking techniques and detection methods specific to host-based cloud environments.

Day 2-3: Literature Review

- Conducted extensive literature review, read over 20 papers related to cryptojacking detection.
- Compiled findings into a literature review table for reference.

Day 4-5: System Design and Dataset Search

- Designed the system architecture for cryptojacking detection.
- Spent time searching for suitable datasets, found one on Kaggle towards the end of the week.

Week 3: Data Preprocessing and Initial Model Implementation

Day 1-2: Data Preprocessing

- Preprocessed the acquired dataset to prepare it for model training.
- Handled missing data, normalized features, and ensured data quality.

Day 2-4: Machine Learning Model Implementation

- Implemented initial machine learning models including K-Nearest Neighbors (KNN), Random Forest, and Decision Tree for detection.
- Evaluated model performance but encountered overfitting issues.

Day 5: Overcoming Overfitting

- Explored techniques such as regularization, cross-validation, and feature engineering to address overfitting.
- Continued refining models to achieve better generalization performance.

Week 4 : Finalizing Project Implementation

Day 1-2: Model Tuning and Evaluation

1. Address Overfitting
 - Regularization: Apply regularization techniques such as L1 or L2 regularization to your models.
 - Cross-validation: Use cross-validation to better assess model performance and reduce overfitting.
 - Pruning : If using decision trees, ensure they are pruned to avoid overfitting.
2. Feature Engineering
 - Feature Selection : Identify and remove irrelevant features.
 - Feature Creation : Create new features that might help improve model accuracy.

Day 3: Final Model Selection and Implementation

1. Final Model Training
 - Retrain your models with optimized parameters.
 - Ensure the final dataset is balanced and preprocessed correctly.
2. Evaluation
 - Evaluate the final models using metrics such as accuracy, precision, recall, F1-score, and ROC-AUC.
 - Compare the performance of KNN, Random Forest, and Decision Tree models and select the best performing model.

Day 4: System Integration and Testing

1. System Integration :
 - Integrate the selected model into your system design.
 - Implement necessary scripts or functions for real-time data processing and detection.
2. Testing :
 - Conduct extensive testing to ensure the system performs well under different scenarios.
 - Test for both normal and cryptojacking activities to validate detection accuracy.

Day 5: Final Adjustments and Documentation

1. Final Adjustments :
 - Make any necessary adjustments based on testing results.
 - Ensure the system is robust and ready for deployment.
2. Documentation : Start documenting the entire project process, including methodology, system design, implementation, and testing.

Week 5 : Write Journal/Research Paper

Day 1-2: Paper Writing - Introduction and Literature Review

1. Introduction:
 - Write the introduction, stating the problem, its significance, and your objectives.
2. Literature Review:
 - Compile the literature review table into a coherent section.
 - Highlight key findings from the papers you reviewed and their relevance to your work.

Day 2-3: Paper Writing - Methodology and Implementation

1. Methodology:
 - Describe your approach to solving the problem, including data collection, preprocessing, and feature engineering.
2. Implementation:
 - Detail the models you implemented, the steps taken to address overfitting, and the final selection process.

Day 3-4: Paper Writing - Results and Discussion

1. Results:

- Present the performance metrics of your models.
 - Include charts and graphs to visually represent your findings.
2. Discussion:
- Interpret your results, explaining why certain models performed better.
 - Discuss the implications of your findings and potential applications.
- Day 5: Paper Writing - Conclusion and Future Work**
1. Conclusion:
- Summarize the key points of your research and its contributions.
2. Future Work:
- Suggest areas for further research or improvements.

Week 6 : Finalize and Publish

Day 1-2: Paper Finalization and Submission Preparation

- Reviewed the draft of the paper with supervisors and incorporated feedback.
- Made final revisions and ensured the paper adhered to journal submission guidelines.

Day 2-3: Paper Finalization and Submission

- Proofread the final version for clarity, coherence, and grammatical accuracy.
- Prepared supplementary materials (figures, tables, appendices) as required by the journal.

Day 3-4: Paper Submission and Presentation Preparation

- Submitted the finalized paper to the target journal or conference.
- Created a concise and visually engaging presentation summarizing the research for final presentation.

Day 5: Presentation and Project Conclusion

- Delivered the final presentation to supervisors, team members, and stakeholders.
- Summarized the key findings, contributions, and future directions during the presentation