

Class Activity : Research Aim, Objectives and Research question

Research Aim : Develop a machine learning based system for sentiment analysis in social media posts to improve understanding of user opinions and sentiments

Research Objectives:

1. To critically analyse the current literature to understand the state-of-the art sentiment analysis models and the datasets for social media sentiment analysis.
2. To develop a machine learning model for sentiment analysis using natural language processing techniques.
3. To evaluate the performance of the developed model on benchmark datasets and real-world social media data.

Research Questions

1. What are the state-of-the art sentiment analysis models and the social media datasets?
2. Which machine learning models is more suitable for sentiment analysis in social media post ?
3. How does the developed model performed compared to existing sentiment analysis models ?

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Research Aim : Investigate the effectiveness of deep learning algorithms for detecting malware in network traffic to enhance cybersecurity defenses.

Research Objectives:

1. To critically review the current literature on malware detection methods in network traffic analysis to assess their strengths and limitations
2. To collect a dataset of network traffic data containing both benign and malicious activities and extract relevant features for analysis
3. To develop deep learning models for malware detection using convolutional neural networks (CNNs) and recurrent neural networks (RNNs)
4. To evaluate the performance of the developed models on the selected dataset and compare them with traditional malware detection methods.

Research Questions

1. What are the strengths and limitations of existing malware detection methods in network traffic analysis?
2. What are the most informative features for detecting malware in network traffic data on the collected dataset ?

3. What are the most suitable deep learning models for malware detection ?
4. How do deep learning models perform compared to traditional malware detection methods in network traffic analysis?

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Research Aim : Investigate the impact of code refactoring techniques on software maintainability and quality in large-scale software systems.

Research Objectives:

1. To conduct a critical analysis of existing literature on code refactoring techniques and their impact on software maintainability and quality in large-scale software systems.
2. To apply different refactoring techniques to refactor the identified code smells.
3. To measure the impact of refactoring on software metrics such as code complexity, coupling, and cohesion.

Research Questions

1. What are the effects of code refactoring techniques on software maintainability and quality in large-scale software systems?
2. Which refactoring techniques are most effective in addressing specific code smells and improving software maintainability?
3. How effective are different refactoring techniques in improving software maintainability and quality?

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