MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCOOL OF COMPUTING AND INFORMATICS

DEPARTMENT OF COMPUTER SCIENCE

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THE DEVELOPMENT OF AN INTEGRATED CRIME DETECTION SYSTEM

REG. NO. **COM/B/01-00106/2018**

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1. Problem Statement

Criminal investigations require the integration of various sources of data and the analysis of suspects' behavioural traits. Traditional methods are often limited in providing efficient tools for the comprehensive analysis of crime data and suspect behaviours. This project aims to develop an integrated Crime Detection System to address these limitations and provide an effective solution for law enforcement agencies.

2. Objective of the Project

The primary objective of this project is to design, develop, and evaluate an integrated Crime Detection System that combines data analysis, sentiment analysis, and machine learning to predict potential suspects based on various attributes. The project will focus on the following:

- ✓ Integrating data analysis, sentiment analysis, and machine learning techniques into a single system.
- ✓ Evaluating the system's effectiveness and accuracy in predicting potential suspects.
- ✓ Developing user-friendly interfaces for law enforcement agencies and suspects.

3. History and Background

Traditional crime detection methods rely on manual data analysis and individual judgment, which can be time-consuming and prone to errors. Advanced technologies, such as machine learning and sentiment analysis, have shown promise in improving the accuracy and efficiency of crime detection. This project builds upon these technologies and integrates them into a unified Crime Detection System.

4. Approach/Methodology

The project will use the following methodologies:

- ✓ Develop an integrated Crime Detection System with data analysis, sentiment analysis, and machine learning components.
- ✓ Collect and preprocess relevant data, including suspect information, witness statements, and crime scene data.
- ✓ Implement sentiment analysis to assess the emotions, obedience, consistency, and confidence of suspects and witnesses.
- ✓ Utilize machine learning algorithms to predict potential suspects based on collected data.
- ✓ Create user interfaces for law enforcement agencies and suspects to interact with the system.

5. Requirements

To implement the project, the following resources will be required:

- ❖ Python programming language
- ❖ MySQL database management system
- ❖ Machine learning libraries (e.g., scikit-learn)
- ❖ Sentiment analysis tools (e.g., NLTK)
- ❖ Web development tools (HTML, CSS, JavaScript)
- ❖ Server space for system deployment

6. Progression Timeline

EVENT	DESCRIPTIONS	DURATION	START	FINISH
✓ Project planning and Proposal	➢ Plan project ➢ Set up development environment ➢ Design the entire project architecture ➢ Prepare Proposal presentation ➢ Proposal presentation to stakeholders ➢ Proposal review and feedback ➢ Design review based on proposal feedback	3 weeks	27/10/2023	17/11/2023
✓ Data Collection and	➢ Design data collection user interface	3 weeks	18/11/2023	09/12/2023

Sentiment Analysis Module	➢ Develop and test data collection module ➢ Begin development of sentiment analysis module ➢ Continue sentiment analysis module development			
✓ User Interface, Training Data, and Deployment	➢ Develop machine learning model ➢ Implement MySQL database for data storage ➢ Start working on privacy protection measures	2 weeks 4 weeks	10/12/2023 03/01/2024	24/12/2023 31/01/2024
✓ User Interface, Training Data, and Deployment	➢ Finalize user interface for administrators, witnesses and suspects ➢ Prepare and manage training data ➢ Test and validate the system ➢ Deploy the system, write and complete project documentation	3 weeks	01/02/2024	22/02/2024

✓ Project Presentation Preparation and verification by supervisor	➢ Ongoing validation and verification ➢ Project presentation preparation	2 weeks	23/02/2024	08/03/2024
✓ Report Writing	➢ Report Writing and documentation	1 week	09/03/2024	18/03/2024
✓ Project Presentation	✓ Project presentation to judges and SCI staff	1 day	___	____
✓ Report Submission	✓ Thesis and Report Submission	1 day	____	_____
✓ **Project Review and Evaluation**	➢ Continuous project review and evaluation	Continuous	_____	_____

7. References

1. James, G., Witten, D., Hastie, T., & Tibshirani, R. (2017). An Introduction to Statistical Learning with Applications in R. Springer.

2. Jurafsky, D., & Martin, J. H. (2019). Speech and Language Processing. Pearson.

3. Raschka, S., & Mirjalili, V. (2019). Python Machine Learning. Packt Publishing.