

**FACULTY OF ENGINEERING AND
TECHNOLOGY
DEPARTMENT OF COMPUTER ENGINEERING AND
INFORMATICS**

**FINAL YEAR PROJECT REPORT
A REAL TIME FUEL THEFT DETECTION AND ALERT
SYSTEM FOR VEHICLES**

By

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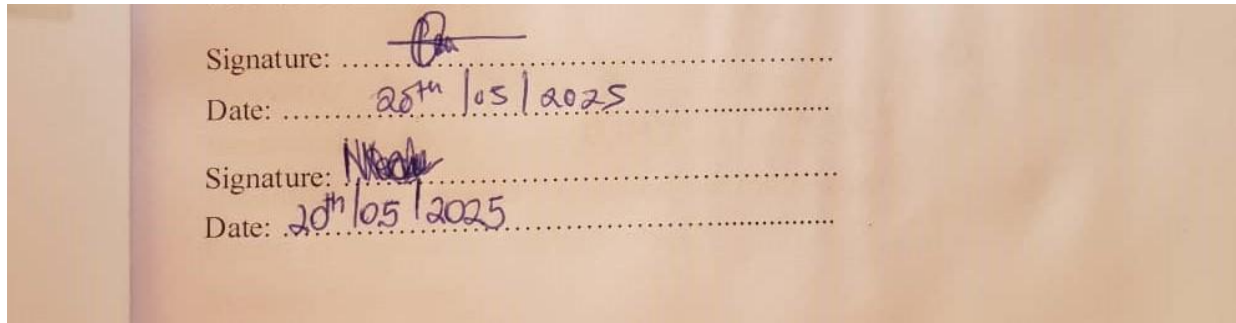
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This Final Year Project Report submitted to the Department of Computer Engineering and Informatics in a partial fulfillment of the requirement for the award of the degree of Bachelor of Science in Computer Engineering of Busitema University

May, 2025

DECLARATION

We, **OCHOM FELIX** and **NAFULA MERCYINE** do hereby declare that this project report was done by us and has never been submitted to any Academic Institution of Higher Learning for an academic award.



Signature:
Date: 20th / 05 / 2025

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APPROVAL

This is to certify that this project report was carried out under our supervision. It is now ready for submission to the Board of Examiners of Busitema University with our due approval.

Signature: Date:
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DEDICATION

We dedicate this report to our parents for the unrelenting financial, material and emotional support and my excellent supervisor Dr. Matovu Davis.

ACKNOWLEDGEMENT

We express our deepest gratitude to the Almighty God for the gift of life and the opportunity to pursue an education.

We are sincerely thankful to our parents and our beloved friends for their unwavering support, encouragement, and motivation throughout this journey.

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ABSTRACT

Fuel theft in vehicles is a persistent challenge that leads to significant operational losses, especially in fleet management. This project presents a Real-Time Fuel Theft Detection and Alert System for Vehicles, designed to detect suspicious fuel activity using sensor-based monitoring and real-time data storing. The system employs ultrasonic sensors to measure fuel levels in both the main tank and reserve tank, interfaced with an Arduino Uno microcontroller for continuous data collection. A Wi-Fi module transmits sensor data to a remote server via an API, enabling real-time monitoring. On the backend, PHP and MySQL manage data storage and processing, while the frontend dashboard developed using HTML, CSS, JavaScript, and Bootstrap displays live fuel metrics and triggers alerts based on defined theft detection algorithms. These include conditions such as fuel being removed from the reserve tank while the main tank is not empty, or when the quantity withdrawn from reserve tank exceeds the amount added to the main tank. A grace period mechanism is also implemented to reduce false alerts during normal fuel transfers. Upon detecting theft, the system triggers real-time alerts for immediate response. This solution enhances fuel security, accountability, and operational efficiency in vehicle fuel management.

LIST OF ACRONYMS

IDE	Integrated Development Environment
IoT	Internet of Things
API	Application Programming Interface
LCD	Liquid Crystal Display
Wi-Fi	Wireless Fidelity
PCB	Printed circuit board

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