



An IOT-based Design framework for Enhanced Accident Detection Utilizing GPS GSM and Wi-Fi Technology

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**I have read this thesis and that in my opinion it is fully adequate, in scope and in quality, as
a thesis for the degree of Master of Science.**

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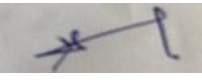
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DECLARATION

This is to certify that the work is entirely my own and not of any other person, unless explicitly acknowledged (including citation of published and unpublished sources). The work has not previously been submitted in any form to the Sri Lanka Institute of Information Technology or to any other institution for assessment for any other purpose.

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ABSTRACT

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The rising number of road accidents harmed the increasing death rate and the development of the country. Current research studies have found that minimizing the accident rate is the best solution for death mitigation and crash control. The main objective of the study is to develop an advanced safety accident detection system utilizing GPS, GSM, and Wi-Fi technologies to enhance road safety and accelerate emergency responses. This research evaluates the conceptual framework and development of IOT utilized in advancing safety accident detection framework integrating the use of GPS, GSM, and Wi-Fi technologies to manage accidents and generate real-time alerts. This study expects to significantly enhance accident management through real-time alerting and emergency response generation. To detect the accident, the framework employs the YOLO module and integrates a random forest model to identify the accident environment under three main categories. The research approach included a review of the literature, the creation of a prototype, and modeling and testing. This research outcome shows how IoT-based accident detection systems work effectively by utilizing GPS, GSM, and Wi-Fi technologies to improve accident advanced safety and accident detection on time. The IoT framework was tested based on different testing phases; those steps offered high performance on each level of testing, like 90% accuracy, 95% precision, 100% recall, and 100% F1 score. These findings strengthen the framework's efficiency and effectiveness in accident detection and reporting with the advanced use of the YOLO module and ROBO FLAW features.

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