AI-Based Hazard Reporting and Prioritization System

Submitted in partial fulfillment of the requirements for the award of the degree of

Bachelor of Engineering

In

Computer Science & Engineering (Artificial Intelligence)

By

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Under the guidance of

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Certificate

This is to certify that Mini Project work entitled “AI-Based Hazard Reporting and Prioritization System” is carried out by STUDENT NAME bearing USN under the guidance of Prof. Assistant Professor, Dept. of CSE(AI), in the partial fulfillment for the award of the Bachelor of Engineering in Computer Science & Engineering (Artificial Intelligence) of Visvesvaraya Technological University, Belagavi, during the year 2023-24.

Abstract

Efficient hazard management improves public safety and infrastructure resilience. This report introduces an AI-based hazard reporting system leveraging NLP models like BERT for text classification and real-time traffic data integration for urgency prediction. Achieving high accuracy, the system automates hazard classification and prioritization, enabling timely interventions and enhancing urban management.

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1. Introduction

Hazards such as potholes, drainage leaks, and garbage accumulation can lead to significant safety risks and infrastructure degradation if not addressed promptly. This project proposes an AI-based hazard reporting system that automates classification and urgency prediction, improving public safety.

2. Literature Review

Studies demonstrate the utility of AI models and real-time data integration in improving hazard classification and management. BERT plays a critical role in NLP applications for hazard description classification.

3. Requirement Specification

Hardware: i5 Processor or above, 8GB RAM
Software: Python, Jupyter Notebook, TomTom API

4. Methodology

The system integrates NLP and real-time traffic data for hazard classification and prioritization. BERT is used for text classification, and urgency prediction relies on regression models.

5. Results and Discussion

Performance metrics include 95% accuracy in classification and reliable urgency prediction with low response times.

6. Implementation Outcomes

Snapshots of the system interface and BERT fine-tuning process demonstrate effective implementation.

7. Conclusion

The system showcases how AI and real-time data can streamline hazard reporting, leading to faster responses and safer urban environments.

8. Future Scope

Enhancements include multilingual support, broader data integration, and scalability improvements.

9. References

1. Devlin et al. (2018). BERT: Pre-training of deep bidirectional transformers for language understanding.
2. Shu et al. (2020). Disaster management using AI models.
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