

VISVESVARAYA TECHNOLOGICAL UNIVERSITY
BELAGAVI -590018



A PROJECT REPORT ON

“AI Based Accident Detection using Deep Learning”

Submitted in Partial Fulfillment of the Requirements for the VIII Semester

Bachelor of Engineering in
Computer Science and Engineering

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I further undertake that the matter embodied in the dissertation has not been submitted previously for the award of any degree by me to any other university or institution.

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ABSTRACT

Road accidents remain a significant cause of death and injury worldwide, with delayed emergency response often worsening the outcome. This study proposes a comprehensive system for real-time accident detection using Closed Circuit Television (CCTV) footage, integrated with an automated emergency alert mechanism. The system harnesses the power of deep learning, specifically Convolutional Neural Networks (CNNs) enhanced with an attention mechanism, to accurately detect accidents from live traffic video streams. Unlike traditional systems that rely on additional sensors or manual monitoring, the proposed model uses existing surveillance infrastructure, making it cost-effective and scalable.

The model is trained on a labeled dataset of accident and non-accident frames and achieves an impressive accuracy of 96%. It incorporates ReLU activation functions for feature extraction and softmax for classification. Upon detecting an accident, the system extracts the camera's geolocation from its IP address and identifies the three nearest hospitals within a 111 km radius. An automatic alert is then generated and sent, including the precise location, to facilitate immediate medical response.

Implementation of the system involves three main phases: data preprocessing, model training with an attention-enhanced CNN, and deployment with a real-time alerting web application. Performance evaluation includes analysis of training and validation loss, accuracy, and a confusion matrix, all of which indicate robust and reliable operation. The system is capable of detecting a wide range of accident scenarios and responding within 2–3 minutes, supporting concurrent access by multiple authorities.

This work represents a significant step towards intelligent transportation systems (ITS) by improving emergency response times and potentially saving lives. Future enhancements may involve integrating audio data, exploring transfer learning techniques, and improving system scalability for deployment across larger networks. The fusion of deep learning with real-time video processing and geolocation-based alerts presents a powerful tool for modern traffic management and accident response systems.

CONTENTS

Topics	Page No
Chapter 1: INTRODUCTION.....	01
1.1 LITERATURE SURVEY.....	02
1.2 MOTIVATION.....	07
1.3 PROBLEM STATEMENT.....	08
1.4 OBJECTIVES OF THE PROJECT.....	08
1.5 PROPOSED SYSTEM.....	09
Chapter 2: REQUIREMENTS SPECIFICATION.....	11
2.1 SOFTWARE REQUIREMENTS.....	11
2.2 HARDWARE REQUIREMENTS.....	14
2.3 SYSTEM REQUIREMENTS.....	16
Chapter 3: SYSTEM DESIGN.....	13
3.1 SYSTEM ARCHITECTURE OVERVIEW.....	13
3.2 MODULE DESCRIPTION.....	19
3.3 DATA FLOW DESIGN.....	21
3.4 USE CASE DIAGRAM.....	21
3.5 SYSTEM SEQUENCE DIAGRAM.....	24
3.6 DATA STRUCTURES AND ALGORITHMS.....	24
3.7 SYSTEM BEHAVIOR UNDER FAULT CONDITIONS.....	25
3.8 SCALABILITY AND EXTENSIBILITY.....	25
3.9 SECURITY DESIGN.....	25
3.10 COMPLIANCE AND STANDARDS.....	25
3.11 DESIGN VALIDATION STRATEGY.....	26
3.12 INTEROPERABILITY DESIGN.....	26
3.13 REDUNDANCY AND FAULT TOLERANCE.....	26
3.14 USER INTERACTION DESIGN.....	26
3.15 ENVIRONMENTAL CONSIDERATIONS.....	27
3.16 DEPLOYMENT STRATEGY.....	27
3.17 DESIGN LIMITATIONS.....	28

Chapter 4: SYSTEM IMPLEMENTATION29

4.1 INTRODUCTION.....	29
4.2 HARDWARE IMPLEMENTATION.....	29
4.3 SOFTWARE DEVELOPMENT.....	30
4.4 COMMUNICATION MODULES.....	31
4.5 CLOUD AND DATABASE IMPLEMENTATION.....	31
4.6 SYSTEM INTEGRATION.....	32
4.7 TESTING AND VERIFICATION.....	32
4.8 PERFORMANCE METRICS.....	33
4.9 CHALLENGES FACED.....	33
4.10 FUTURE ENHANCEMENTS.....	33
4.11 SUMMARY.....	33
4.12 REAL-WORLD USE CASE SCENARIOS.....	34
4.13 SECURITY AND PRIVACY CONSIDERATIONS.....	34
4.14 MODULAR SYSTEM DESIGN.....	35
4.15 DIAGRAMS AND DATA FLOW.....	35
4.16 COMPARISON WITH EXISTING SYSTEMS.....	37
4.17 DEPLOYMENT CONSIDERATIONS.....	37
4.18 MAINTENANCE AND SUPPORT.....	38

Chapter 5: TESTING AND RESULTS.....39

5.1 INTRODUCTION.....	39
5.2 TESTING METHODOLOGIES.....	39
5.3 TESTING ENVIRONMENT SETUP.....	40
5.4 SAMPLE TEST CASES AND OUTPUT.....	41
5.5 PERFORMANCE METRICS.....	42
5.6 ERROR HANDLING AND SYSTEM RESILIENCE.....	42
5.7 USER FEEDBACK AND APP USABILITY.....	43
5.8 LIMITATIONS IDENTIFIED.....	43
5.9 COMPARATIVE RESULTS.....	43
5.10 EXTENDED COMPARATIVE ANALYSIS WITH COMMERCIAL SYSTEMS.....	44
5.11 TESTING CHALLENGES ENCOUNTERED.....	44

5.12	AUTOMATED LOGGING AND DEBUGGING UTILITIES.....	45
5.13	RECOMMENDATIONS BASED ON TESTING.....	46
5.14	POTENTIAL FIELD DEPLOYMENT SCENARIOS.....	46
5.15	CODE COVERAGE AND TEST AUTOMATION.....	46
5.16	SCALABILITY TESTING RESULTS.....	46
5.17	FINAL CONCLUSION OF TESTING PHASE.....	47
5.18	SUMMARY.....	47
	CONCLUSION.....	48
	REFERENCE.....	49
	RESULTS.....	50

LIST OF FIGURES

Figures	Page No
Figure 3.1: Layered Architecture Diagram.....	19
Figure 3.4.1: Use Case Diagram.....	22
Figure 3.4.2: Use Case Diagram.....	23
Figure 3.4.3: Use Case Diagram.....	23
Table 4.15.1: Flow Chart of the proposed system.....	36
Table 4.15.2: CNN model.....	36
Table 4.15.3: Confusion matrix.....	37
Figure 4.15.1: Statistics.....	22
Figure 4.15.2: CNN model.....	23
Figure 4.15.3: Confusion matrix.....	24

LIST OF TABLES

TABLE	Page No
Table 1.1.1: Comparative Analysis.....	6
Table 1.1.2: Summary of Related Work.....	7
Table 4.8: Performance Metrics.....	33
Table 4.16: Comparison With Existing Systems.....	37
Table 5.2: System Testing.....	40
Table 5.5: Performance Metrics.....	42
Table 5.7: User Feedback And App Usability.....	43
Table 5.9: Comparative Results.....	43
Table 5.10: Extended Comparative Analysis With Commercial Systems.....	44