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

Project Associate:

Mr. Rajashekhar Naduvinahalli

2KA21CS037

Under the Guidance of:

Dr. Arunkumar Joshi

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

SMT. KAMALA & SRI VENKAPPA M. AGADI

COLLEGE OF ENGINEERING & TECHNOLOGY

LAXMESHWAR-582116

2024-25

Smt. Kamala & Sri Venkappa M. Agadi

College of Engineering and Technology, Laxmeshwar-582116

Certificate

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

This is to certify that Mr. Rajashekhar Naduvinahalli bearing the USN 2KA21CS037 respectively have satisfactorily completed the Project Work entitled "AI Based Accident Detection using Deep Learning" in partial fulfillment for the VIII Semester Bachelor of Engineering of Visvesvaraya Technological University Belagavi, during the year 2024-25. Project Report has been approved, as it satisfies the academic requirements in respect of Project Work.

…….	……	…….	…….
Project Guide	**Project Coordinator**	**HOD**	**Principal**
Dr. Arunakumar Joshi	**Dr. Arunakumar Joshi**	**Dr. Arun Kumbi**	**Dr. Parashuram Baraki**

Examiners:

1)…… **2)…….**

DECLARATION

I, **Rajashekhar Naduvinahalli (2KA21CS037)** studying in the VIII semester of Bachelor of Engineering in Computer Science and Engineering at Smt. Kamala & Sri. Venkappa M. Agadi College of Engineering & Technology , Lakshmeshwar, hereby declare that this project work entitled **"AI Based Accident Detection using Deep Learning"** which is being submitted by me in the partial fulfillment for the award of the degree of Bachelor of Engineering in Computer Science and Engineering, from Visvesvaraya Technological University, Belagavi is an authentic record of we carried out during the academic year 2024-2025, under the guidance of Dr.Arunkumar Joshi Department of Computer Science & Engineering, Smt. Kamala & Sri. Venkappa M. Agadi College of Engineering & Technology, Lakshmeshwar.

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.

Place: Lakshmeshwar

Date:

Rajashekhar Naduvinahalli
2KA21CS037

ACKNOWLEDGEMENT

It is my proud privilege and duty to acknowledge the kind of help and guidance received from several people in preparation of this seminar. It would not have been possible to prepare this report in this form without their valuable help, cooperation and guidance.

I wish to record our sincere gratitude to our project guide **Dr.Arunkumar Joshi** of Computer Science and Engineering Department for guiding me in investigations for this project and providing encouragement, constant support and guidance which was of a great help to complete this seminar successfully.

I thank our Project Coordinator Dr. Arunkumar Joshi provided the necessary guidance and the facilities to carry out the project

I am grateful to **Dr. Arun Kumbi, Head of the Department of Computer Science and Engineering** for giving me the support and encouragement that was necessary for the completion of this project work.

I would also like to express my gratitude to **Dr. Parashuram Barki, Principal,** for providing me pleasant environment to work in library and for providing laboratory facilities needed to prepare this report.

Last but not the least, i wish to thank my **parents** for financing my studies in this college as well as for constantly encouraging me to learn engineering. Their personal sacrifice in providing this opportunity to learn engineering is gratefully acknowledged.

Rajashekhar Naduvinahalli
2KA21CS037

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.

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