VISVESVARAYA TECHNOLOGICAL UNIVERSITY

"Jnana Sangama" Belagavi – 590 018

PROJECT REPORT ON

"RAILWAY TRACK FAULT DETECTION USING ARDUINO"

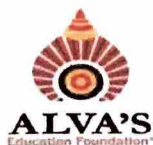Submitted in partial fulfillment of the requirements for the award of degree

BACHELOR OF ENGINEERING
IN
ELECTRONICS & COMMUNICATION ENGINEERING

Submitted By

Name	USN
MEGHA R	4AL19EC046
NIKHIL C R	4AL19EC049
SANJUSHREE V	4AL19EC067
SHANTVEER PATIL	4AL19EC069

Under the Guidance of
Dr.GURUPRASAD B

Senior Assistant Professor
Department of E&C Engineering

ALVA'S
Education Foundation

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

ALVA'S INSTITUTE OF ENGINEERING & TECHNOLOGY

MOODBIDRI – 574 225.

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ALVA'S INSTITUTE OF ENGINEERING & TECHNOLOGY

MOODBIDRI – 574 225

(Affiliated to VTU, BELAGAVI)

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

CERTIFICATE

Certified that the project work entitled "**RAILWAY TRACK FAULT DETECTION USING ARDUINO**" is a bona fide work carried out by

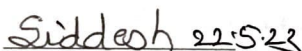|	
MEGHA R	**4AL19EC046**
NIKHIL C R	**4AL19EC049**
SANJUSHREE V	**4AL19EC067**
SHANTVEER PATIL	**4AL19EC069**

in partial fulfillment for the award of **BACHELOR OF ENGINEERING** in **ELECTRONICS & COMMUNICATION ENGINEERING** of the **VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI** during the year 2022–2023. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the departmental library. The project report has been approved as it satisfies the academic requirements in respect of Project work prescribed for the Bachelor of Engineering Degree.

Signature of the Guide   Signature of the H.O.D   Signature of the Principal

Dr.Guruprasad B   **Dr.Siddesh G K**   **Dr. Peter Fernandes**

H. O. D.
Dept. Of Electronics & Communication
Alva' · Institute of Engg & Technology
Mijar, MOODBIDRI - 574 225

PRINCIPAL
Alva's Institute of Engg. & Technology,
Mijar, MOODBIDRI - 574 225, D.K

EXTERNAL VIVA

Name of the Examiners   Signature with date

1. Harsha C T

2. Dr. Siddesh GK

ABSTRACT

Railway track fault detection is a critical task in ensuring the safety and efficiency of railway operations. Traditional methods for detecting track faults rely on manual inspections, which are time-consuming and can lead to errors or missed defects. In recent years, there has been an increasing interest in developing automated systems for track fault detection. The main objective of this research is to propose a novel method for railway track fault detection using machine learning techniques. The proposed system consists of two stages: data acquisition and fault detection. In the data acquisition stage, a network of sensors is installed along the track to collect data on various parameters such as vibration, temperature, and pressure. The data is then pre-processed to remove noise and irrelevant information.

In the fault detection stage, a machine learning algorithm is applied to the pre-processed data to identify any abnormalities or defects in the track. The algorithm uses a combination of supervised and unsupervised learning techniques to detect faults such as cracks, misalignments, and worn-out tracks. The system can also predict the location and severity of the fault, enabling maintenance crews to take corrective actions before a major incident occurs. The proposed method has several advantages over traditional manual inspection methods. It is faster, more accurate, and can detect faults that may be missed by human inspectors. Furthermore, it can reduce maintenance costs by enabling targeted repairs rather than costly track replacement.