

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY
BELAGAVI – 590 010**



PROJECT REPORT

ON

“WEATHER FORECASTING USING LSTM”

Submitted in partial fulfilment of the requirements for the award of degree,

BACHELOR OF ENGINEERING

IN

ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

Submitted By

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ALVA'S
Education Foundation®

DEPARTMENT OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

ALVA'S INSTITUTE OF ENGINEERING & TECHNOLOGY

(Unit of Alva's Education Foundation (R), Moodbidri)

Affiliated to Visvesvaraya Technological University, Belagavi

Approved by AICTE, New Delhi. Recognized by Government of Karnataka.

Accredited by NAAC with A+ Grade

Shobhavana Campus, Mijar-574225, Moodbidri, D.K., Karnataka

2023 – 2024

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DEPARTMENT OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING CERTIFICATE

This is to certify that the Project entitled **"WEATHER FORECASTING USING LSTM"** has been successfully completed by

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the bonafide students of **Department of Artificial Intelligence & Machine Learning, Alva's Institute of Engineering and Technology** in partial fulfillment for the award of **BACHELOR OF ENGINEERING, DEPARTMENT OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING** of the **VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI** during the year 2023-2024. 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.

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ABSTRACT

Weather forecasting predicts future weather conditions. Weather forecasting is critical in several areas like crop planning based on the weather, transportation for safety, planning the energy demands, disaster management for preparedness, and public health for protecting vulnerable populations from weather-related risks like heatwaves and air pollution.

Weather forecasting is done using historical data, current atmospheric conditions, and mathematical models. Machine learning is a well-known technique to predict weather forecasting. To predict the weather, there are many machine learning models and techniques such as k Nearest Neighbor (KNN), Support Vector Machine (SVM), Gradient Boost (GB), and Extreme Gradient Boost (XGB) are used. However, these techniques lack accuracy, computation speed and also in precision. To address this issue, this project proposed and designed a novel method to predict the weather using the Long Short-Term Memory (LSTM) technique. LSTM is renowned for modelling temporal dependencies in data and is suitable for predicting weather patterns. Integrating LSTM with real-time datasets from weather APIs aims to provide accurate and timely forecasts. This direct access to real-time data enhances adaptability to changing conditions. Leveraging machine learning, the system analyzes vast data, improving forecast accuracy. These applications span agriculture, transportation, disaster preparedness, and public safety, where precise weather information is crucial for informed decision-making and risk mitigation.