ESG RISK ANALYSIS & STOCK MARKET PREDICTION

by

K.GEETHANJALI
Roll No. 214G1A3324

S.MOHAMMED GHOUSE
Roll No. 214G1A3354

G.GANESH
Roll No. 214G1A3323

S.ISMA MEHARAZ
Roll No. 214G1A3334

Under the guidance of

Dr. C. NAGESH M. Tech., ph.D
Assistant Professor

Department of Computer Science and Engineering (AI & ML)

Srinivasa Ramanujan Institute of Technology

(Affiliated to JNTUA & Approved by AICTE) (Accredited by NAAC with 'A' Grade & Accredited by NBA (EEE, ECE & CSE)
Rotarypuram Village, B K Samudram Mandal, Ananthapuramu – 515701.

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Review-0 Comments

- Recommended to change the title make it more aligned with the project's purpose.
- Gather more detailed information and include research papers or case studies.
- Based on the review comments, we have completely revised the project from **Facial Diagnosis with CNN Algorithm** to **ESG Risk Analysis & Stock Market Prediction** to align with current trends and enhance its relevance and efficiency.

Problem Statement

Problem Statement:

The problem addressed in this research is to understand how Environmental, Social, and Governance (ESG) factors influence stock market performance and risk analysis. Specifically, the study aims to explore the relationship between ESG practices, financial indicators, and stock prices, using machine learning algorithms to predict market trends and assess the impact of ESG performance on company volatility and long-term financial success. The goal is to determine whether incorporating ESG metrics into financial analyses can improve the accuracy of stock market predictions and guide sustainable investment strategies.

Introduction

➢**PURPOSE:**

The purpose of this study is to explore the growing significance of Environmental, Social, and Governance (ESG) factors in investment decisions and risk assessment. It aims to integrate ESG metrics with traditional financial analysis to enhance investment strategies and understand their impact on stock price movements and financial resilience.

➢**TECHNOLOGIES USED:**

This research uses Machine Learning (ML) to analyze the relationship between ESG factors and stock market performance. Techniques like **Supervised Learning** (e.g., Random Forests, SVM, Linear Regression) and **Predictive Analytics** (e.g., Neural Networks, Gradient Boosting) are employed to predict stock price movements.

Introduction

➢GOAL:

The goal of this research is to understand how ESG scores affect stock prices and market trends using advanced machine learning techniques. The study aims to show that including ESG factors in investment strategies can help make better decisions and improve financial outcomes.

➢OUTCOME:

The outcome of this study is to help investors understand how ESG factors affect investment results and make better decisions. It shows that including ESG considerations can lead to more informed choices and better financial performance over time.

Proposed System

Proposed System:

ESG Risk Analysis & Stock Market Prediction using Machine Learning involves integrating environmental, social, and governance (ESG) factors into financial forecasting models. Here's a five-point overview of a proposed system:

- **Data Collection and Preprocessing:** The system gathers data from financial markets, ESG reports, and news sentiment, cleaning and normalizing it for use in machine learning models alongside financial data.
- **Feature Engineering:** ESG factors like carbon emissions and employee diversity are transformed into features to assess their impact on stock prices, combined with economic data for financial risk prediction.
- **Model Selection and Training:** Machine learning models such as Random Forest, Gradient Boosting, and LSTM are used to predict stock trends, with ongoing training and updates for accuracy.

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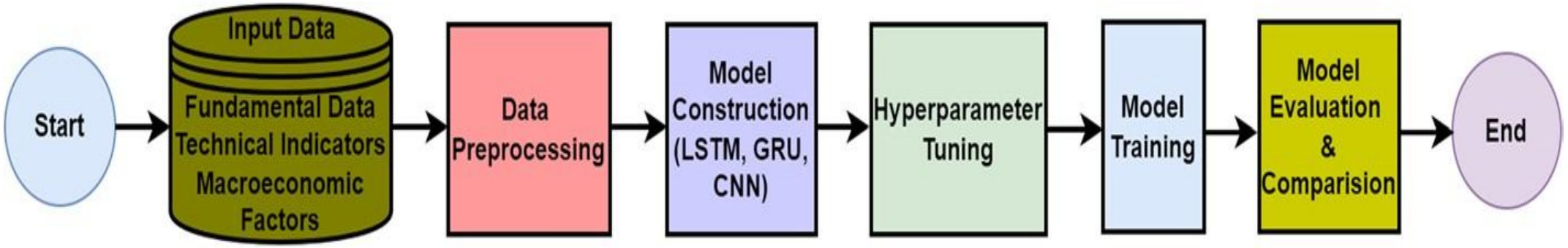
- **Risk Scoring and Forecasting:** The model predicts stock movements and assigns ESG risk scores, identifying companies with high volatility due to poor ESG performance.
- **Decision Support and Portfolio Management:** The system assists investors by displaying ESG risks alongside market predictions, helping to make informed investment decisions and create sustainable portfolios.

Advantages of Proposed System:

- Enhanced Risk Management
- Data-Driven Decision Making
- Improved Portfolio Performance
- Real-Time Adaptability

Design of Proposed System

Schematic approach for proposed system



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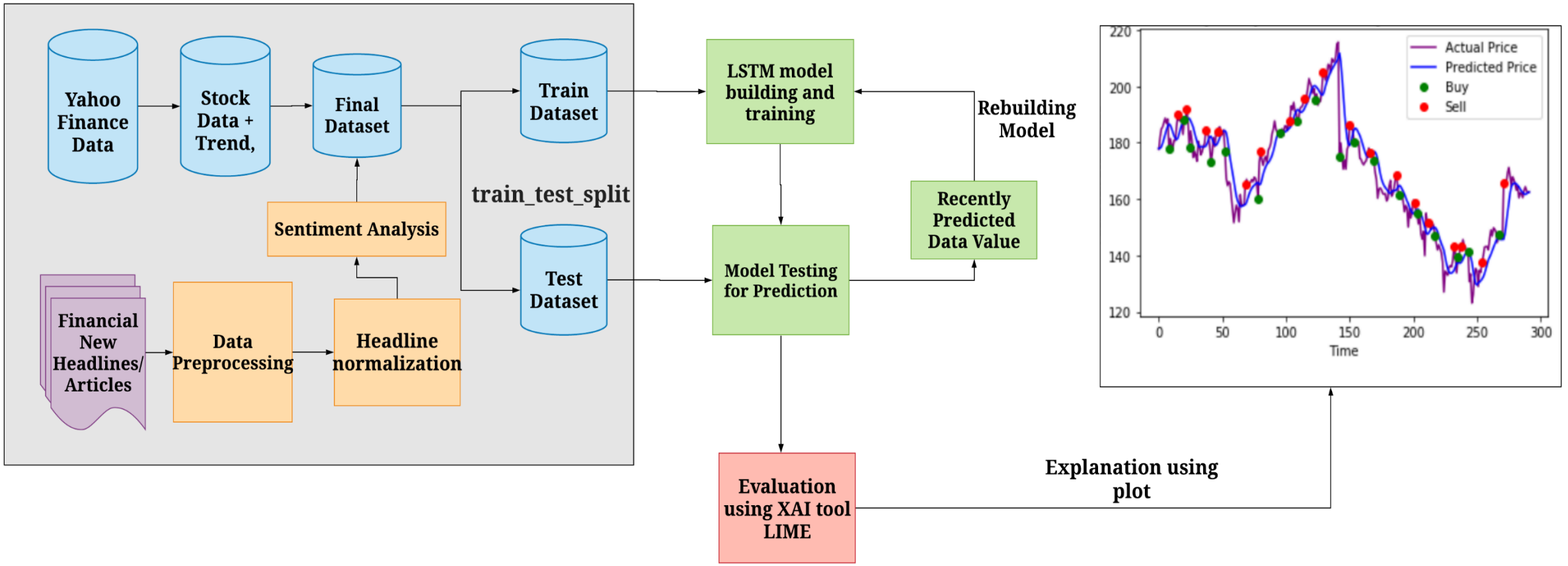
Yahoo Finance Data
Stock Data + Trend,
Final Dataset
Train Dataset
train_test_split
Sentiment Analysis
Financial New Headlines/ Articles
Data Preprocessing
Headline normalization
Test Dataset
LSTM model building and training
Rebuilding Model
Recently Predicted Data Value
Model Testing for Prediction
Evaluation using XAI tool LIME
Explanation using plot
Actual Price
Predicted Price
Buy
Sell
Time

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Any Queries?

Thank You!!!