# Stock Market Prediction Using Machine Learning

## Presenter: Ajmal Amir

**Stock Market Prediction Using Machine Learning**
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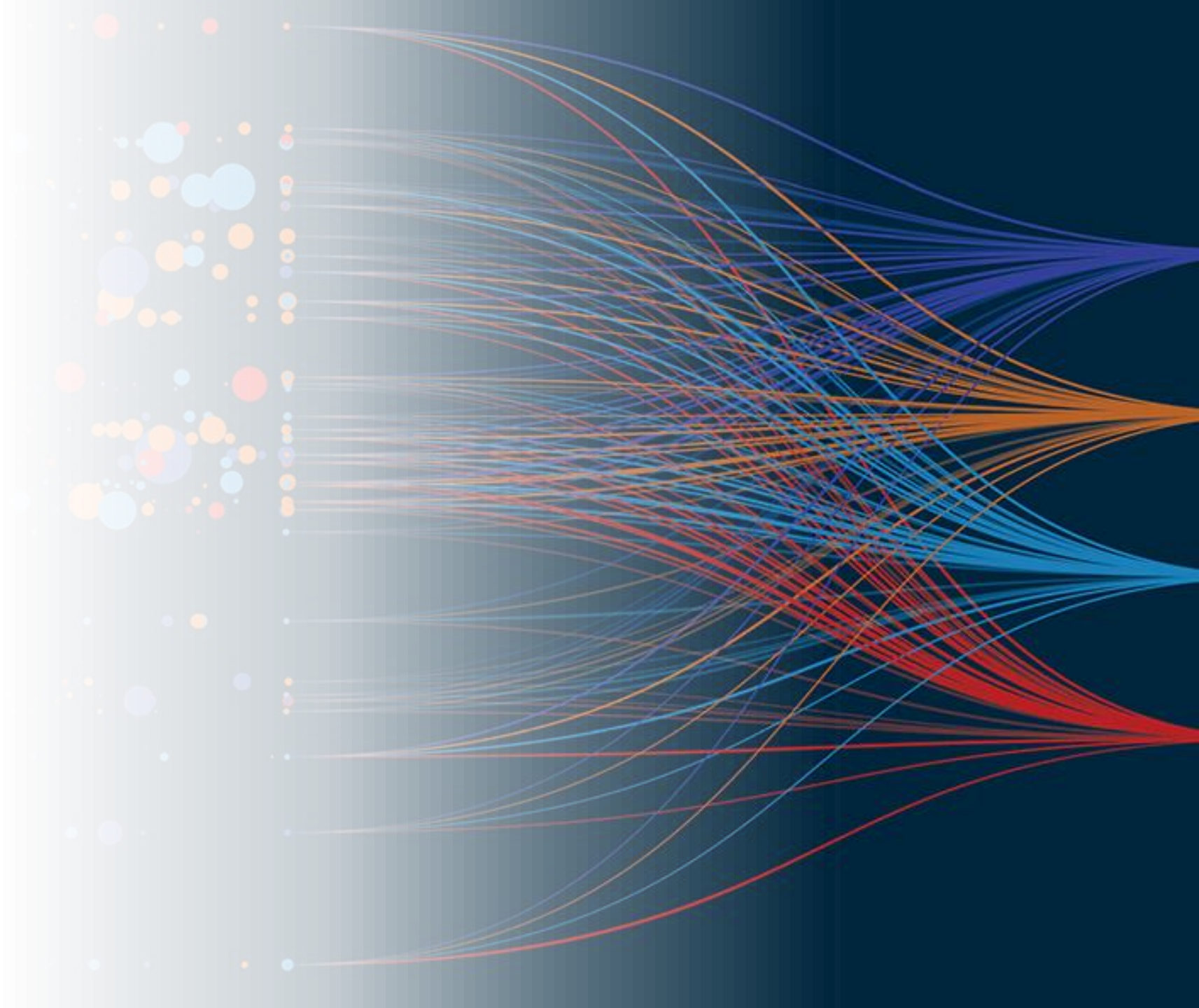
# Problem Statement

**What problem are we tackling?**

- Stock market price prediction is a challenging problem due to the volatile nature of financial markets. This project aims to develop a **machine learning model** to predict stock trends using historical price data.



# Dataset

- **Data Source:** Yahoo Finance API
  **Dataset Link:** https://finance.yahoo.com/quote/NFLX/history/
- **Dataset API:** import yfinance as yf
  - stock_data = yf.download("NFLX", start="2015-01-01", end="2025-01-01")
- **Features Used:**
  - Date
  - Open Price
  - High Price
  - Low Price
  - Closing Price
  - Volume

# Why is this important?

- Helps investors make data-driven decisions.
- Predicting market trends provides insights into potential investment opportunities.
- Machine learning techniques can help improve the accuracy of traditional forecasting models.

# Survey on Related Work

- **Primary Paper:**
- **Title :** "Stock Market Prediction Using Machine Learning"
- **Authors**: Abdulhamit Subasi, Faria Amir, Kholoud Bagedo, Asmaa Shams, Akila Sarirete
- **Year**: 2021
- **Published in**: Procedia Computer Science
- **Why?** This paper examines various machine learning models and compares their performance in predicting stock market trends.

# Survey on Related Work Conte...

## Other Related Papers:

- **Title :** "Time series forecasting of stock market using ARIMA, LSTM, and FB Prophet"
- **Authors**: Asha Sunki, C. SatyaKumar, G. Surya Narayana, Vinith Koppera, Manish Hakeem
- **Year**: 2024
- **Published in**: MATEC Web of Conferences, ICMED 2024
- **Why?** This paper compares ARIMA with other forecasting models, providing a strong basis for understanding traditional time-series forecasting.

# Survey on Related Work Conte...

- **Title:** "An efficient hybrid approach for forecasting real-time stock market indices"
- **Authors:** Riya Kalra, Tinku Singh, Suryanshi Mishra, Satakshi, Naveen Kumar, Taehong Kim, Manish Kumar
- **Year:** 2024
- **Published in:** Journal of King Saud University - Computer and Information Sciences
- **Why this paper?** It explores hybrid machine learning techniques for stock market forecasting, providing insights into combining different methods for better accuracy.

# Method of Selected Paper

- The paper implements **traditional machine learning models**, such as:
  - **Linear Regression** for trend analysis.
  - **Support Vector Machines (SVM)** for classification of stock movements.
  - **Random Forest Regression** for predicting future stock prices.
- Uses **historical price data** to predict future stock movements.
- Evaluation metrics: **Mean Absolute Error (MAE), Root Mean Squared Error (RMSE)**.

# Plan and Timeline

| Phase | Task | Duration |
|---|---|---|
| Data Collection | Fetch historical stock data from Yahoo Finance | Week 1 |
| Exploratory Data Analysis | Visualizing trends, feature engineering | Week 2 |
| Model Implementation | Train Regression, SVM & Random Forest models | Week 3-4 |
| Evaluation & Testing | Compare models, fine-tune hyperparameters | Week 5 |
| Report Writing | Document findings and prepare slides | Week 6 |
| Presentation | Finalize presentation and submit | Week 7 |

# Expected Learning Outcomes

- Understanding the **limitations and effectiveness** of stock prediction models.
- Comparing **traditional ML models** such as regression, SVM, and Random Forest.
- Learning about **feature engineering** and its role in financial modeling.
- Gaining experience in **evaluating and improving predictive models**.

# References


1. Sunki, Asha, et al. "Time series forecasting of stock market using ARIMA, LSTM, and FB Prophet." *MATEC Web of Conferences, ICMED 2024*, 2024.
2. Subasi, Abdulhamit, et al. "Stock Market Prediction Using Machine Learning." *Procedia Computer Science*, 2021.
3. Kalra, Riya, et al. "An Efficient Hybrid Approach for Forecasting Real-Time Stock Market Indices." *Journal of King Saud University - Computer and Information Sciences*, 2024.

# End Of Proposal

- **GitHub Repo:** https://github.com/ajmal-amir/MarketIQ.git