Project Meeting Minutes: Neural Network Stock Price Prediction

Student: Abdul Rashid Omeni

Supervisor: Prof. Frank Wang

Proposed Project Title: Against the Complexity-Performance Paradigm: A Systematic Comparison of Neural Network Stock Price Predictions with MDA-Driven Feature Selection

---

Meeting 1: Project Kick-off

- **Date & Time:** February 8, 2025, 4:00 PM
- **Discussion:**
    - Introductory meeting to discuss the project's scope, objectives, and initial expectations.
    - Outlined the high-level goal of comparing neural network architectures for stock prediction.
    - Frank advised that I get and study the book " Make your own Neural Network" – By Tariq Rashid

---

Meeting 2: Research and Resource Planning

- **Date & Time:** February 21, 2025, 4:00 PM
- **Discussion:**
    - Discussed available academic and technical resources.
    - Explored strategies for finding similar open-source projects to learn from and potentially reverse-engineer for foundational understanding.

Meeting 3: Technical Discussion & Data Acquisition Challenge

- **Date & Time:** May 15, 2025, 9:00 AM
- **Discussion:**
    - Discussed the significant challenge of acquiring real Twitter (X) data for sentiment analysis feature engineering.
    - Reviewed a commercial quote of $350 for ~40K tweets, which I deemed too costly for an academic project. Could find another way around it.
    - **Action Item/Decision:** It was decided to generate synthetic tweet data to simulate market sentiment, treating it as a controlled experiment to overcome data scarcity.

Meeting 4: Project Overview and Pipeline Design

- **Date & Time:** May 10, 2025, 1:00 PM
- **Discussion:**
    - Detailed discussion on the project's technical pipeline.
    - The plan is to implement both univariate and multivariate models using different neural network architectures.
    - The preprocessing pipeline will include historic price data, technical indicators, and synthetically generated sentiment analysis data.

Meeting 5: First Code Implementation & Synthetic Data Demo

- **Date & Time:** June 24, 2025, 2:00 PM
- **Discussion:**
    - Demonstrated the first running code implementation.
    - Showcased the method for generating and integrating synthetic tweet data as a proxy for market psychology.

- **Action Item/Decision:** The approach of using synthetic data was validated for its utility in representing a controlled feature set, since the implementation closely mimics market behaviour.
- The need for a form of Visualisation instead of just the display from Jupiter notebook…. To be locked into

---

Meeting 6: Feature Selection Implementation

- **Date & Time:** July 8, 2025, 2:00 PM
- **Discussion:**
    - Discussed research into feature importance methods: Mean Decrease in Impurity (MDI), Mean Decrease in Accuracy (MDA), and Single Feature Importance (SFI).
    - **Action Item/Decision:** Implemented MDA for robust feature selection. This successfully identified and discarded redundant features, saving significant computational resources before model training. The curse of dimensionality was completely avoided.

Meeting 7: Initial Pipeline Demonstration (LSTM Model)

- **Date & Time:** July 15, 2025, 2:00 PM
- **Discussion:**
    - Successfully demonstrated the entire code pipeline using a simple LSTM model.
    - The pipeline integrates quantitative finance methodologies with machine learning, processing market data, technical indicators, and sentiment analysis.
    - Reviewed initial model metrics and prediction visualizations.

Meeting 8: Full Pipeline Walkthrough & Advanced Architectures

- **Date & Time:** August 5, 2025, 2:00 PM
- **Discussion:**
    - Comprehensive walkthrough of the complete, end-to-end prediction pipeline (CNN-LSTM architecture). Visualisation via the Streamlit application
    - The system includes:
        - Institutional-grade technical feature engineering.
        - Rigorous MDA-driven feature selection.
        - Time-series sequencing and robust scaling.
        - An intelligent pruning phase based on permutation importance.
        - A close to production-ready forecasting with extensive visualizations and diagnostics.
    - **Key Achievement:** The project now includes **8 distinct prediction architectures** for a robust comparative analysis, enhancing both predictive results and model explainability.

Meeting 9: Thesis Writing Strategy & Evaluation

- **Date & Time:** August 12, 2025
- **Discussion:**
    - Discussed the approach to writing the thesis and final project expectations.
    - **Action Items for Thesis:**
        1. Describe the Software Engineering approach used (e.g., Waterfall, Agile) to explain project management.
        2. Detail the Design & Implementation phases thoroughly.
    - Discussed evaluation metrics. **Frank Advice:** Evaluation by a third party is a good practice to incorporate for validation.

Post-Meeting Administrative Note

- **Date:** August 19, 2025
- **Note:** Informed Prof. Wang via email that the project corpus submission had been extended to **August 29, 2025**. The final dissertation submission deadline is **September 16, 2025**.

Cancelled/Postponed Meetings

- March 14, 2025: Postponed due to technical glitches.
- July 22, 2025: Postponed due to poor connection; rescheduled.
- July 29, 2025: Cancelled due to exams the following day.

Minutes Prepared by: Abdul Rashid Omeni
Date: Compiled today, August 25, 2025