

SiliconSTOCKS



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INTRODUCTION

This project implements a stock trading strategy in Verilog, based on the Kelly Criterion, and is deployed on an FPGA. It uses inputs from technical indicators like RSI, EMA, and Momentum to generate buy/sell signals, and calculates the optimal investment fraction using the Kelly algorithm. The system tracks stock holdings and profit in real-time, simulating a hardware-based trading system.

METHODOLOGY

Stock data is received via Ethernet and stored in RAM for quick access. Three trading algorithms—Momentum, RSI, and EMA—process the data in parallel to generate signals. A consensus logic selects the final action based on majority agreement. This decision is passed to the Kelly Criterion module, which calculates the optimal investment amount and expected profit. The system continuously updates holdings and tracks performance in real time on FPGA.

RESULTS

The results demonstrated that our project gives accurate and quantitatively optimized trading decisions (54% accuracy), balancing risk and reward effectively, with parallel processing allowing faster real-time responses

WORKING

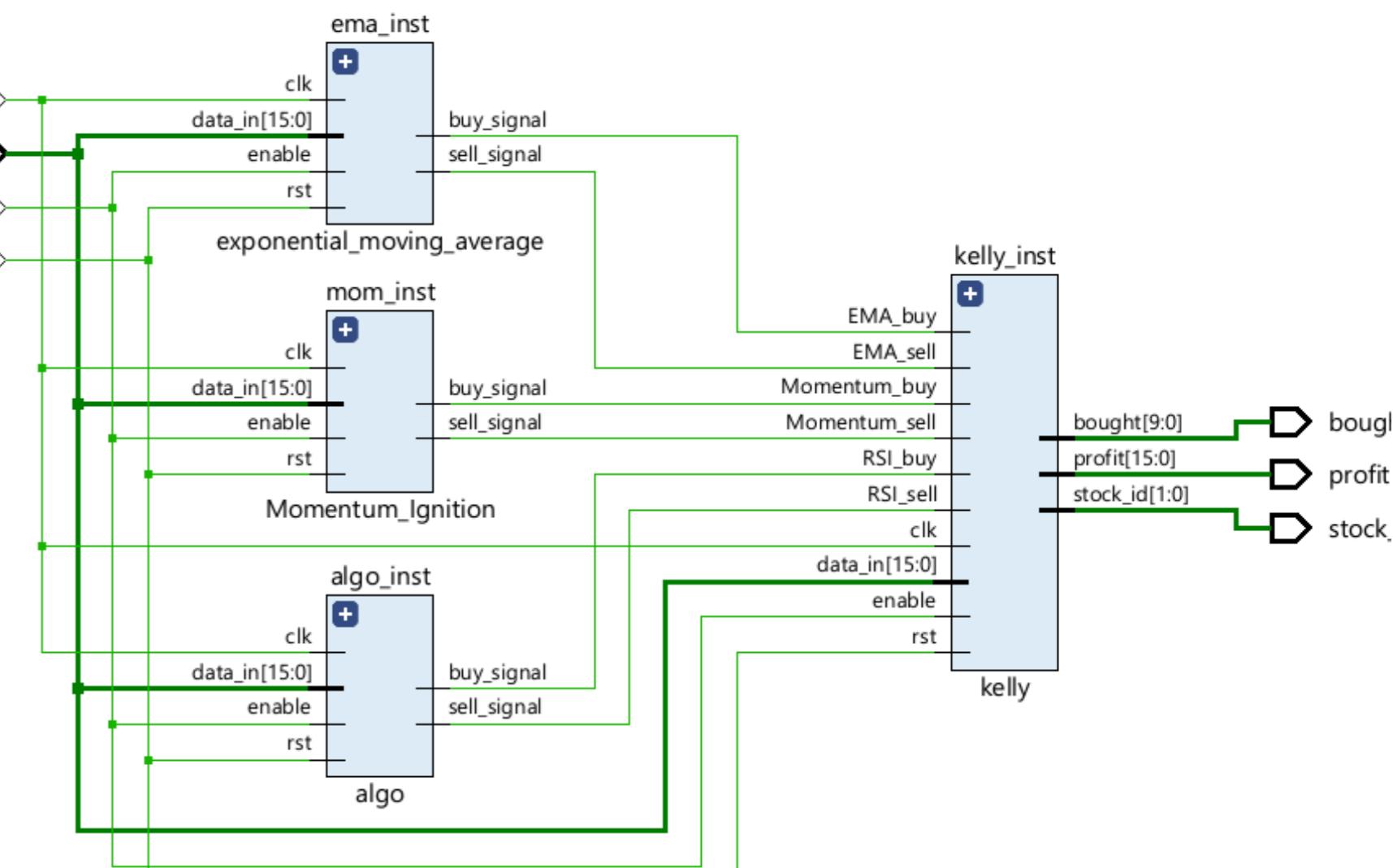
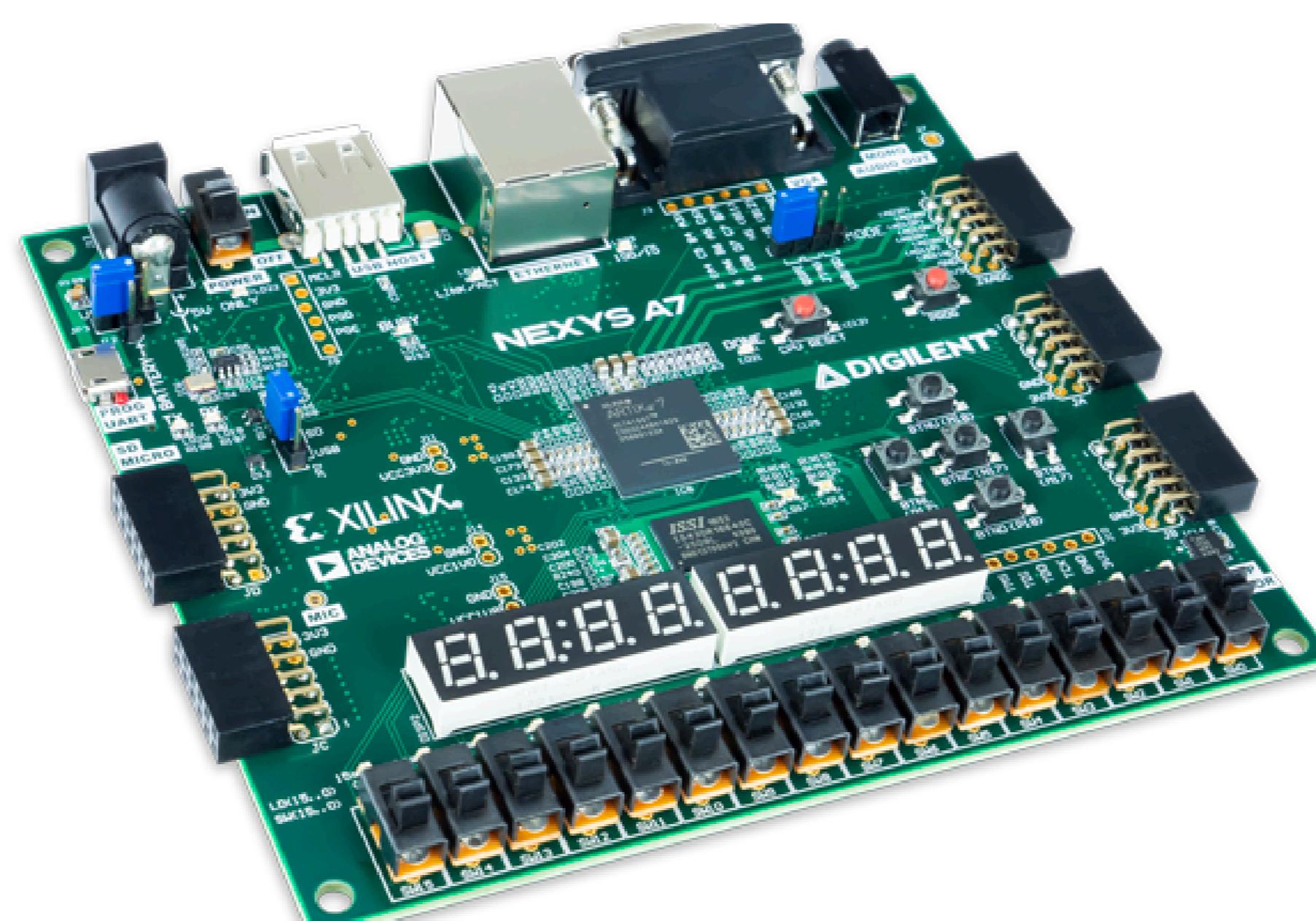
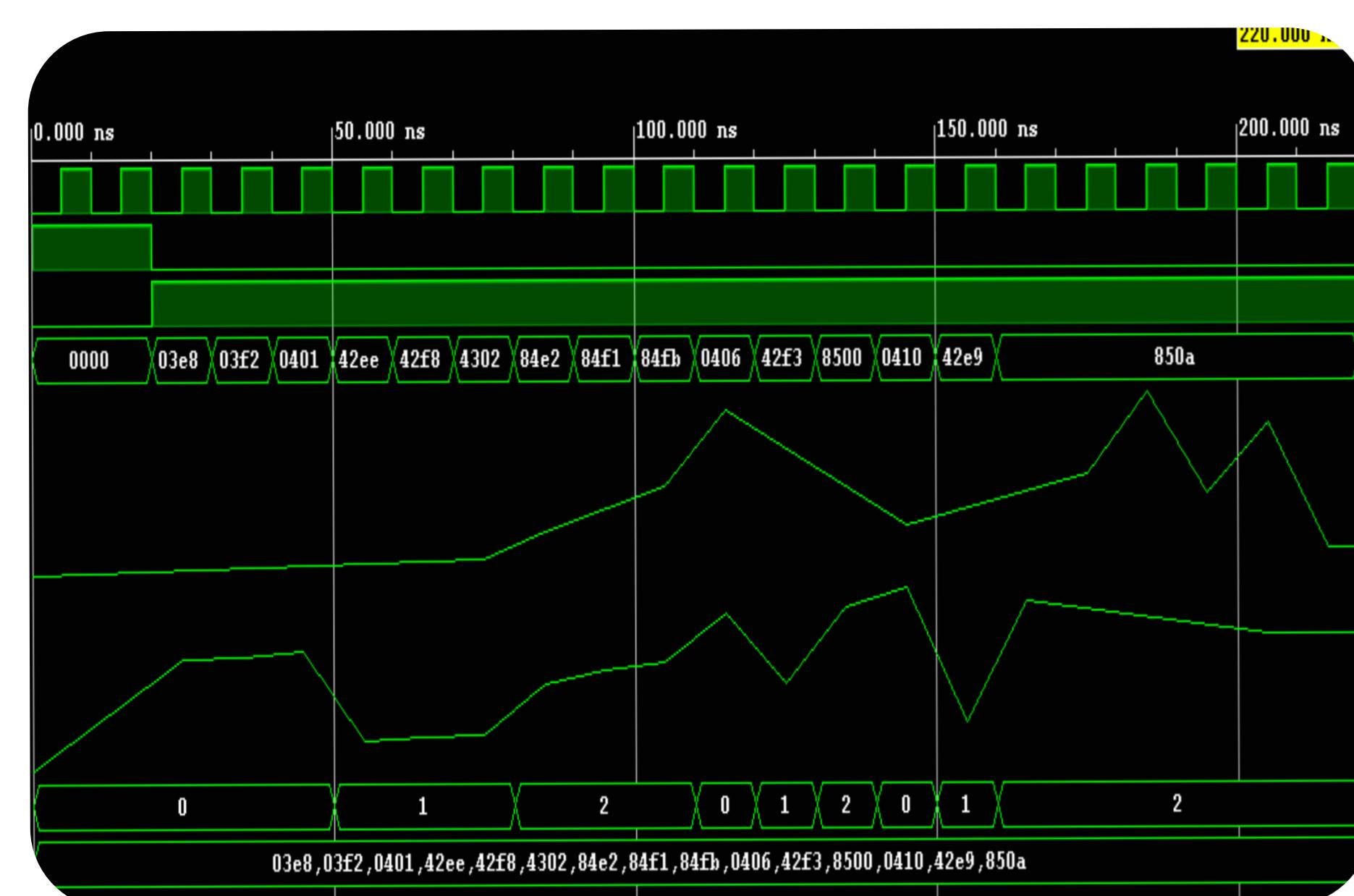
We begin by receiving dummy stock price data from a laptop via the Ethernet protocol. This data is stored in RAM to facilitate efficient access during processing. Once stored, the data is simultaneously fed into three trading algorithms parallelly:

1. Momentum Ignition Algorithm
2. RSI (Relative Strength Index) Algorithm
3. Exponential Moving Average (EMA) Algorithm

Each algorithm independently analyzes the data and produces a trading signal—Buy, Sell, or Hold—based on its unique strategy. To ensure robustness in decision-making, we only consider a signal valid if at least two algorithms generate the same outcome.

The consensus signal is then passed into a Kelly Fraction Algorithm, which calculates the optimal capital allocation. This final algorithm provides us with two crucial pieces of information:

1. The expected profit from the trade
2. The ideal quantity of stock to purchase



FUTURE GOALS

The future goals of the project include enhancing the accuracy and efficiency of the trading algorithms by integrating advanced machine learning techniques for predictive analysis. Additionally, there are plans to incorporate real-time market data streaming, allowing for faster decision-making and more dynamic responses to market changes.