Recurrent Neural Network Embedded Fuzzy System

with Applications in Stock Market Forecasting and Trading

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ABSTRACT

This project proposes a novel architecture called Recurrent Neural Network Embedded Fuzzy System (RNNEFS) which combines fuzzy system and RNN. The system is capable of not only making **accurate prediction** for time series data but also providing high **interpretability** and **transparency** of the predicting process.

DESIGN & IMPLEMENTATION
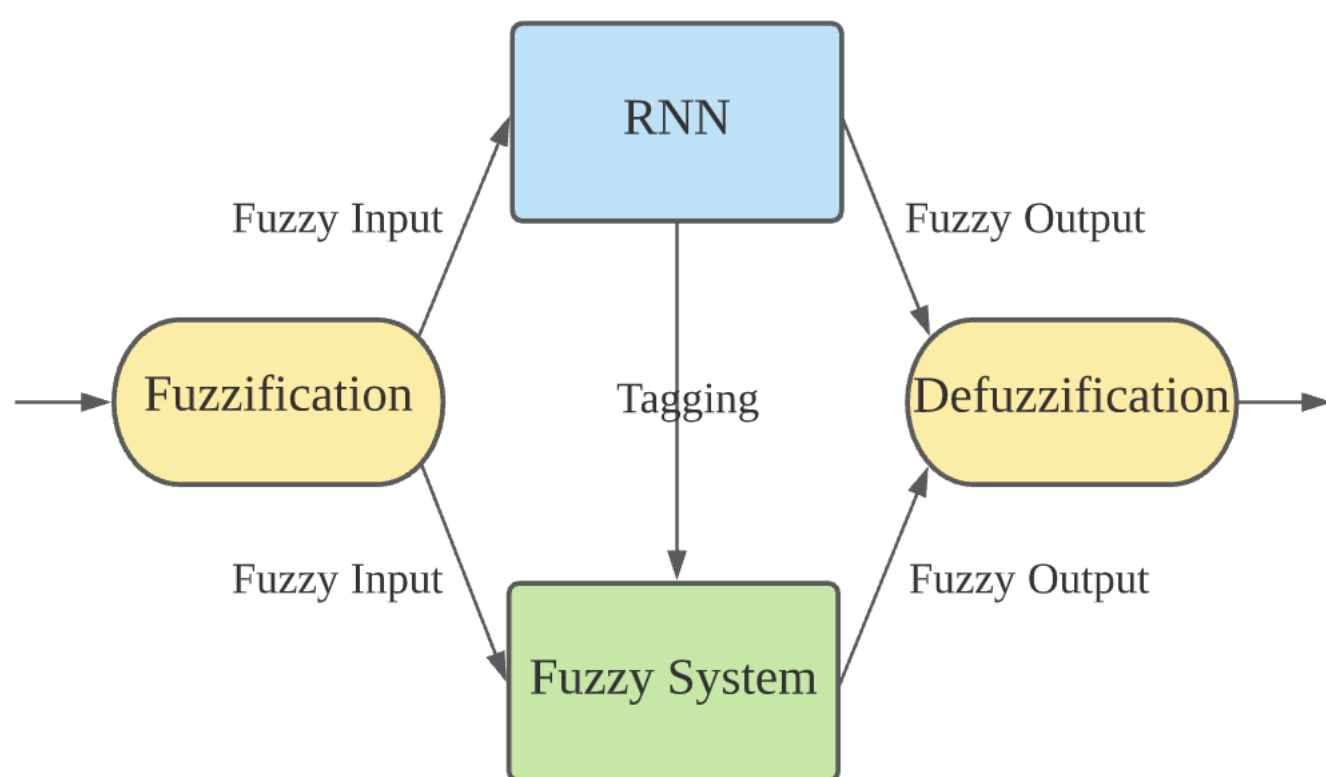
- The crisp input is fuzzified and simultaneously fed into the parallel RNN and fuzzy system
- The embedded RNN learns data patterns and extracts useful information
- RNN and fuzzy system are connected through a tagging mechanism
- Crisp output is obtained through defuzzification

RESULTS & APPLICATIONS

The proposed system demonstrates higher accuracy and interpretability in stock market prediction compared to RNN, fuzzy systems and neuro-fuzzy systems. When combined with MACD trading strategies, it is able to generate optimal returns throughout different market scenarios.