COSE474-2024F: Final Project Proposal
"Predicting Bitcoin Price based on Sentiment Analysis using LSTM-Random Forest"

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1. Introduction

Bitcoin is one of the most popular cryptocurrencies, known for its large price swings. These price changes are influenced by many factors, including market trends, economic events, and people's opinions shared on social media or in the news. Predicting the price of Bitcoin is important for investors who want to manage risks and make better financial decisions.

Recently, machine learning has become a popular tool for predicting financial data because it can find patterns that traditional methods cannot. Long Short-Term Memory (LSTM) networks, a type of deep learning model, are especially good at working with time-series data, such as Bitcoin prices. However, LSTM models alone may not fully capture the complex relationship between Bitcoin prices and factors like public sentiment. To address this, this project explores a combined approach, using both LSTM and Random Forest (RF), a machine learning model that works well with structured data, to improve Bitcoin price predictions.

2. Problem definition & challenges

Predicting Bitcoin prices is challenging because the market is highly unpredictable and affected by many factors. Current methods, including deep learning models like LSTM, can predict price changes to some extent but may struggle when the data is too complex or influenced by emotions and opinions in the market. At the same time, Random Forest models are good at handling these kinds of factors but are not designed to analyze time-series data.

The key questions this research aims to answer are:

1. How can analyzing public sentiment improve Bitcoin price predictions?
2. Can combining LSTM with Random Forest make predictions more accurate compared to using only LSTM?
3. How does the combined model perform compared to using LSTM or Random Forest on their own?

This study focuses on building and comparing models to see if a combined approach can better predict Bitcoin prices and provide more reliable results for users.

3. Related Works

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4. Datasets

5. State-of-the-art methods and baselines

6. Schedule & Roles

References