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CryptoFutureVision

A Deep Learning Approach to Forecast Cryptocurrency Price Based on Social Sentiments and Historical Price Data in Real-Time

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Abstract

Real-time cryptocurrency price prediction is a challenging task that captivates the interest of cryptocurrency investors and traders. The market's high volatility, influenced by multiple factors like news events and social media trends, makes real-time prediction crucial for informed investment decisions. Researchers have experimented with techniques such as deep learning and machine learning to develop models that can predict cryptocurrency prices in real-time. Despite progress, the accuracy and reliability of these models remain a significant challenge.

Deep learning algorithms, such as Long Short-Term Memory (LSTM), are used to predict real-time cryptocurrency prices because of their ability to model sequential data. Because it can capture long-term patterns and dependencies, LSTM is ideal for time-series data such as cryptocurrency prices. By collecting minute-by-minute price data for seven days, the model considers historical and current market trends. Sentiment analysis, in conjunction with LSTM, is used to analyze social media and news sentiment toward cryptocurrencies. This method has the potential to improve the accuracy of cryptocurrency price predictions.

Two real-time cryptocurrency price prediction models were trained with high accuracy metrics. The first model used past price data and achieved an R2 score of 0.970, RMSE score of 0.0289, MAPE score of 0.038, and MAE of 0.0204. The second model incorporated twitter polarity scores along with past price data and achieved an R2 score of 0.9450, RMSE score of 0.006, MAPE score of 0.0056, and MAE of 0.0043. These models can provide valuable insights to cryptocurrency investors and traders. Future improvements include experimenting with new approaches, collecting high-quality data, and optimizing hyperparameters for better accuracy.

Keywords: Long short-term memory, Prediction System, Root Mean Squared Error Cryptocurrency, Social Sentiments, Bitcoin, Deep Learning

Subject Descriptors:

- Computing methodologies → Machine learning → Deep learning → Recurrent neural networks → LSTM