

ReCurrency Network

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PROBLEM STATEMENT

Our aim is to be able to predict currency futures/exchange rates and also correct predict the direction of rate drop/increase with high accuracy. There has not been too much research in this problem. An accurately predicting model could have several financial strategies.

DATASET AND ACQUISITION

Datasets from SEBI, NSE and NSDL which will contain exchange rates. foreign investments, interest and inflation rates.

Scraping from SEBI, NSE and NSDL websites (official sources) using selenium.

LEARNING TECHNIQUES

- Regression (baseline for exchange rate prediction)
- SVM (baseline for directional classification)
- Recurrent Neural Networks (LSTM/GRU) (Advanced)
- AutoRegressive Integrated Moving Average / AutoRegressive neural networks (Advanced)

PRE-PROCESSING TECHNIQUES

- Since we have data from multiple sources, we first parse the data into one dataset without redundancies.
- We will analyze the correlation between the features to determine which features are of more importance
- We will try to perform Dimensionality reduction if our feature set is large.
- Feature scaling

MODEL SELECTION STRATEGY

The unpredictability and time dependence of our data does not allow us to stick to a strictly linear/nonlinear model. For this reason, we are looking to use a Recurrent Neural network since it provides a degree of freedom with respect to predictions. We will analyse learning rate vs error to determine point of largest drop in error.

TRAINING APPROACHES

We will try using the optimizers adam, adadelta, rmsprop along with Gradient descent, and we will also test with SGD.

EVALUATION METRICS

- Normalized mean square error (on held out data)
- Directional Accuracy (whether the model correctly predicted a rise/drop in price.
- We will try to test against some state of the art models such as ARIMA or DeepAR.

DELIVERABLES

Abhishek Maiti -

- Data acquisition
- Recurrent Neural Network (LSTM/GRU)
- Baseline for Regression

Deepak Srivatsav -

- Data pre-processing
- AutoRegressive neural networks
- Baseline for Classification