Evaluation of deep learning models for predicting the support and resistance levels in stock market

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Statement of the Problem: Neural Networks are Deep Learning architectures that surpass the limitations imposed by Machine Learning algorithms. Though the performance of neural networks especially Recurrent Neural Networks for predictive analysis is widely accepted by data science analysts, it still faces the issues of vanishing gradient problem. Long – Short Term Memory (LSTM) and Gated Recurrent Unit (GRU) are two kinds of modified neural networks that resolve the issue. An evaluation is done between Long – Short Term Memory and Gated Recurrent Unit to find the best fit when modeled for predicting the Support and Resistance Levels in stocks retraced by Fibonacci percentages.

Methodology & Theoretical Orientation: LSTM and GRU were modeled for two historical datasets taken from Indian stock exchange. The models trained on 4016 instances from the total instances of 5021. The rest 1005 instances were used for testing purposes. Error metrics were used to assess the level of accuracy and hyper parameters were set to determine the training process. Graphs for error residuals and time taken to train the data were ascertained as computation time.

Findings: The difference between testing and unseen data is less than the lowest value of the dependant variable for both the models by which the level of accuracy can be ascertained, validated through graphs. The set hypermeters except for one were defined by same values for both the models to achieve accuracy. The computation time for GRU is high than LSTM.

Conclusion & Significance: Both the models achieved a high level of accuracy but the residual values for LSTM were less when compared to GRU. All but one of the hyper parameters for GRU was set to a value higher than LSTM. So the computation time for GRU is greater, eventually forming a conclusion that LSTM has a better fit than GRU.

Biography

D. G. Vaishnav College, India. T. Velmurugan is working as an Associate Professor in the PG and Research Department of Computer Science, D.G.Vaishnav College, Chennai, India. Also, he is the Advisor and Head, Department of Computer Applications. He holds a Ph.D. degree in Computer Science from the University of Madras and has 27 years of teaching experience. He guided more than 300 M.Phil. Research Scholars and 13 Ph.D. scholars and published more than 110 articles in SCOPUS and SCI indexed journals. He elected and served as a Senate Member from Academic Council, University of Madras and served as a nominated Senate Member in the Middle East University, Dubai, UAE and Editorial Board Member of 5 International Journals. He was an invited speaker and keynote speaker for many international conferences around the world. He is a member in Board of studies for many autonomous institutions and Universities in India. His H index is 17 and i10 index is 24.