高频金融交易中的价格变动预测建模及实现开题报告

研究内容

目的

• 预测某一只股票未来数个周期内价格的变化方向

工具

● 循环神经网络、卷积神经网络

数据

● 公开的高频限价订单簿基准数据集 FI-2010

主要工作

• 建模、调参、训练

turing machines evaluation metrics blockchain image processing humans female technical indicators deep neural network data analytics support vector regression (svr human railroads technical indicator stock selections financial data covid-19 machine learning techniques quality control convolution algorithms sensitivity analysis nonhuman fishery convolutional networks fintech support vector machines economics losses pakistan article pisces learning models investments machine learning competition uncertainty _{floods} australia event study rain moving average india ecosystem fuzzy logic disasters prediction united states permafrost wetlands short term memory costs forecasting deep neural networks regression analysis china time-series matthiola tree decision trees attention mechanism random forest spatiotemporal analysis carbon sequestration memory architecture attention mechanisms time series mean square error data analysis carbon stock soil property network architecture data set Istm random forests forestry sampling topography news articles arima hybrid approach chinese stock market forest management multiple linear regression stock market index auto-regressive allometry tropics neural-networks machine-learning multivariate analysis sentiment bangladesh stock prices cloud computing rnn memory modeling gru fuzzy neural networks model prediction large amounts forecast



有大量相关文献支撑

时间	作者	题目
2018-02-13	Xingyu Zhou	Stock Market Prediction on High-Frequency Data Using Generative Adversarial Nets
2018-04-20	Bruno Miranda Henrique	Stock price prediction using support vector regression on daily and up to the minute prices
2018-12-20	Faisal Qureshi	Investigating Limit Order Book Characteristics for Short Term Price Prediction: a Machine Learning Approach
2019-03-25	Zihao Zhang	DeepLOB: Deep Convolutional Neural Networks for Limit Order Books
2020-03-23	AH Bukhari	Fractional Neuro-Sequential ARFIMA-LSTM for Financial Market Forecasting
2020-05-19	Adamantios Ntakaris	Mid-price prediction based on machine learning methods with technical and quantitative indicators
2020-08-06	ZinebLanbouri	Stock Market prediction on High frequency data using Long-Short Term Memory
2020-08-09	YuChen Tu	Predicting High-Frequency Stock Market by Neural Networks
2020-10-19	Yuechun Gu	Price Forecast with High-Frequency Finance Data
2021-05-18	Konark Yadav	Stock values predictions using deep learning based hybrid models
2021-06-16	Muye Wang	Essays on the Applications of Machine Learning in Financial Markets
2021-06-21	Yue Yang	Stock Price Prediction Based on XGBoost and LightGBM
2021-07-26	Liang Zeng	Trade When Opportunity Comes Price Movement Forecasting via Locality-Aware Attention and Adaptive Refined Labeling
2021-08-07	Xuerui Lv	Residual Gated Recurrent Unit-Based Stacked Network for Stock Trend Prediction from Limit Order Book

研究工具

为什么?

● 数据量大且精度要求高: 传统机器学习方法有性能瓶颈

适合吗?

- RNN—擅长处理时序数据
- CNN—独特的特性令我想要结合

依托数据

- 已标注数据——适合监督学习
- 大规模——500ms—笔 5支股票合计约40万条的快照行情
- 高质量——10档买卖数据信息

工作内容

不能提出新模型算法、目前没有能力研发框架…那?

注重模型是怎么训练出来的,如

- 超参数的调整
- 试解决过拟合的问题
- 为什么选择某个优化器?
- 学习速率为何设置为这个值?
- 通过阅读有关文献添加手工特征
- 对结果的分析

自身能力

- 单变量微积分 94多变量微积分 82线性代数 94机器学习 87.6数据挖掘 88
- MIT 18.01 18.02 18.06
 Coursera Deep Learning Specialization
- IELTS Reading 8.5
- 知识储备可以应付

评测方法

指标

● 准确度与F-score

目标

• 比数据集源论文中给出的基线准确率高

时间安排

表1 - 时间安排

事项	开始周	结束周	5	6	7	8	9	10	11	12	13	14	15	16	17
设计/调试模型	5	9													
中期检查	10	10													
完成后期实验	11	12													
撰写/修改初稿	13	14													
接受查重	15	15													
接受评阅	16	16													
毕业答辩	17	17													