Neural Networks and Financial Indices in the Stock Trend Prediction

Bimin Yin

254*****

Outline

- Introduction
- Methodology
- Results and Analysis
- Limitations
- Conclusion

Introduction

- Stock price prediction
- Financial indices
  - The moving average (MA)
  - The total amount of money in a day
- Neural Networks models
  - Different types
  - Capacity of prediction

Methodology-Data sets

- Data source
  - Extracted from a software called “TongHuaShun”
- Preprocess
  - Removing unnecessary attributes: such as the date of records and the name of the stock.
  - Calculating relevant financial indices: such as the moving average (MA) of 20,10,5,3 and 2 days ago

Methodology-Training issues

- Architectures
  - The Back-Propagation Architecture
  - The Probabilistic Neural Networks Architecture
  - Unsupervised Kohonen Self Organizing Map Networks Architecture
- Parameters
  - Financial indices
  - Parameters of NN models such as learning rate etc.

Results and Analysis

- Classification scenario
  - BP and PNN

mod	modul	e fun	neu	ate/momentum/ini		input	accuracy/R square
CATE	3L-BP	<0,1>	31	0.1/0.1/0.3	#	close,M2_close-M7_close, close-7-close-1	0.8352
CATE	GA-PNN	none	710	Smoothing Factor 0.6	/	close,M2_close-M7_close, close-7-close-1	0.9366

  - Financial indices

modul	e fun	:	neu	rate/momentum/init		input	accuracy/R square
GA-PNN	<-1,1>	/	710	Smoothing Factor 0.6	/	close,M2_close-M7_close, close-7-close-1	0.9225
GA-PNN	<-1,1>	/	710	Smoothing Factor 0.6	/	close, close-7-close-1	0.6887

Results and Analysis

- Prediction scenario
  - BP and GRNN

mod	modul	.e fun	o		:		input	accuracy/R square
PRED	3L-BP	<0,1>	.an/B		0.:	#	close, M2_close-M7_close, close-7-close-1	0.9704
PRED	GA-GRNN	<0,1>	/		/	/	close, M2_close-M7_close, close-7-close-1	0.9952

  - Financial indices

mod	modul	.e fun	o		:		input	accuracy/R square
PRED	GA-GRNN	<0,1>	/		/	/	Volume, Volume-7-Volume-1, close-7-close-1	0.9908
PRED	GA-GRNN	<0,1>	/		/	/	close, M2_close-M7_close, Volume-7-Volume-1, close-7-close-1	0.9945

Limitations

- Representativeness
  - Attributes cannot fully describe the stock market
- Limited scale
  - Overfitting
- Irrelevant factors
  - Compromise the performance

Conclusion

- Comments
  - NN models perform well in general
  - Financial indices have significant influences
- Contributions
  - Improve the prediction accuracy significantly
  - Further investigation

Thank You