# Neural Networks and Financial Indices in the Stock Trend Prediction

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#### **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

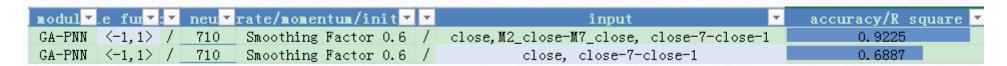
- Financial indices
- Parameters of NN models such as learning rate etc.

## **Results and Analysis**

- Classification scenario
  - BP and PNN

noc	▼ modul	e fur	neu 🕶	ate/momentum/ini	7	input	▼	accuracy/R square 🔽
CAT	E 3L-BP	<0,1>	31	0.1/0.1/0.3	#	close, M2_close-M7_close,	close-7-close-1	0.8352
CAT	E GA-PNN	none	710	Smoothing Factor 0.	6 /	close, M2_close-M7_close,	close-7-close-1	0.9366

Financial indices



## **Results and Analysis**

- Prediction scenario
  - BP and GRNN

mod ~	modul(▼.e fur	01 7 -1 7 7	input	_	accuracy/R square 💌
PRED	3L-BP <0,1>	an/b#0.1#	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 fur	01	- <u>1</u> - 1	input	accuracy/R square 💌
PRED	GA-GRNN	<0,1>	/	1.	Volume, Volume-7-Volume-1, close-7-close-1	0.9908
PRED	GA-GRNN	<0,1>	1	1	lose,M2_close-M7_close,Volume-7-Volume-1, close-7-close-	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