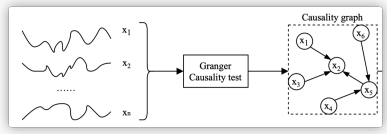
Multi-indicators prediction in microservice using Granger causality test and Attention LSTM

motivation

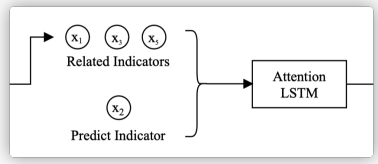
- accurate indicator prediction (time series prediction) relies on related indicators
- traditional approaches uses manual causality among indicators

approach



mine causality relationships between indicators with Granger causality test

When predicting an indicator, use the indicators with strongest causality relationship as input



Using Attention-LSTM to predict the indicator

evaluation

- Subjects
  - trainticket
  - 24 real KPIs from a internet company
- Baseline approaches — ARIMA
- Evaluation Metrics — mean absolute error (MAE)
- MAE results on ARIMA/LSTM+indicator itself/LSTM+strongest related indicators/ LSTM+weakest indicators
  - 子主题 1

ARIMA	Attention LSTM (indicator itself)	Attention LSTM (indicator+ strongest causality indicators)	Attention LSTM (indicator+ weakest causality indicators)
38.86	38.67	32.97	38.63

  - 子主题 2

ARIMA	Attention LSTM (indicator itself)	Attention LSTM (indicator+ strongest causality indicators)	Attention LSTM (indicator+ weakest causality indicators)
8.55	8.49	7.62	8.34

- case studies
  - 子主题 1