Predicting TCP/IP network traffic using time series forecasting

Interim Presentation

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RECAP

goal: forecast TCP/IP traffic

- real-time and short-time

data set

- network traffic of three months
- three different resolutions

approaches

- classical time series prediction methods
- neural networks

THOMAS APPROACH

neural networks

- non-linear learning
- flexible, powerful
- less well behaved

feed-forward network

- multilayer perceptron (MLP) network
- most commonly used for forecasting
- sliding window over input series (i.e. set of lags)
- one hidden layer with n neurons

recurrent network

- allows cycles
- long short-term memory (LSTM) architecture
- influence of past values decays quickly → memory cells
- well-suited for time series forecasting

problems and expectations

- LSTM is not straightforward
- LSTM should outperform MLP

accuracy measures

- sum squared error (SSE)
- symmetric mean absolute percentage error (sMAPE)
- ...

scaled errors

- compare forecasts on series of different scales
- mean absolute scaled error (MASE)
- compare forecast with naïve method
- seasonal version: $\hat{y}_{t+h,t} = y_{t+h-K}$

Questions?