USING TENSORFLOW TO SOLVE THE PROBLEMS OF FINANCIAL FORECASTING FOR HIGH-FREQUENCY TRADING
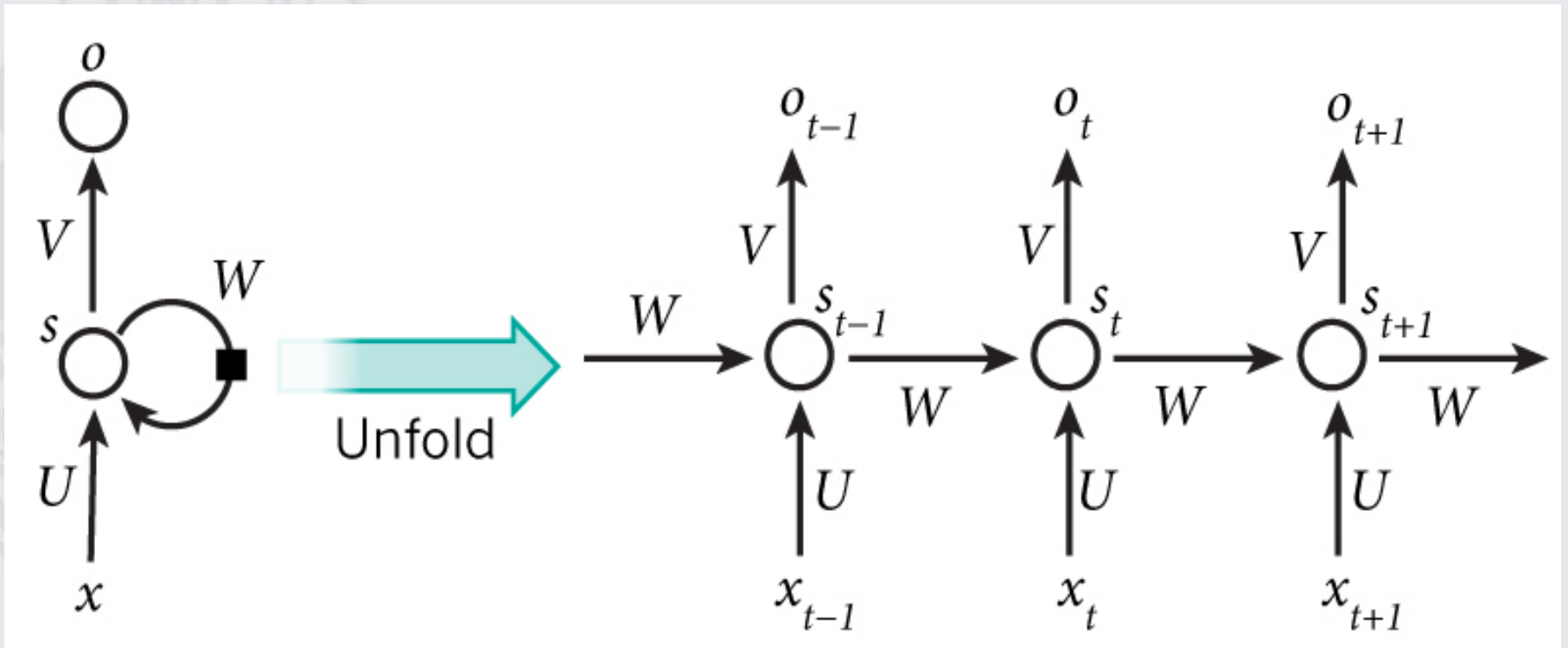
ALEXEY STANKUS

High Frequency Trading:

- From ms to sec

- Not a regular time series
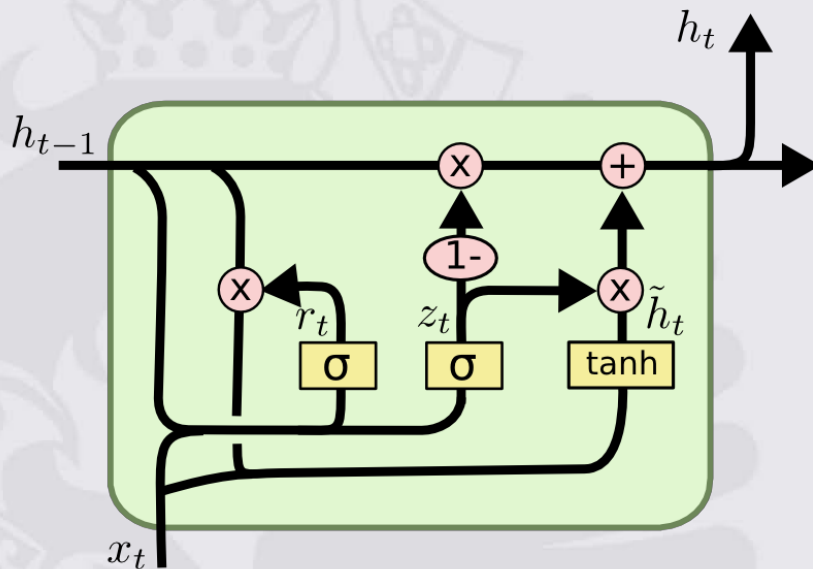
- Does not depend on the news background

Recurrent Neural Network

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Long-short term memory

$$z_t = \sigma \left(W_z \cdot [h_{t-1}, x_t] \right)$$

$$r_t = \sigma \left(W_r \cdot [h_{t-1}, x_t] \right)$$

$$\tilde{h}_t = \tanh \left(W \cdot [r_t * h_{t-1}, x_t] \right)$$

$$h_t = (1 - z_t) * h_{t-1} + z_t * \tilde{h}_t$$

A slightly more dramatic variation on the LSTM is the Gated Recurrent Unit, or GRU, introduced by Cho, et al. (2014). It combines the forget and input gates into a single "update gate." It also merges the cell state and hidden state, and makes some other changes.
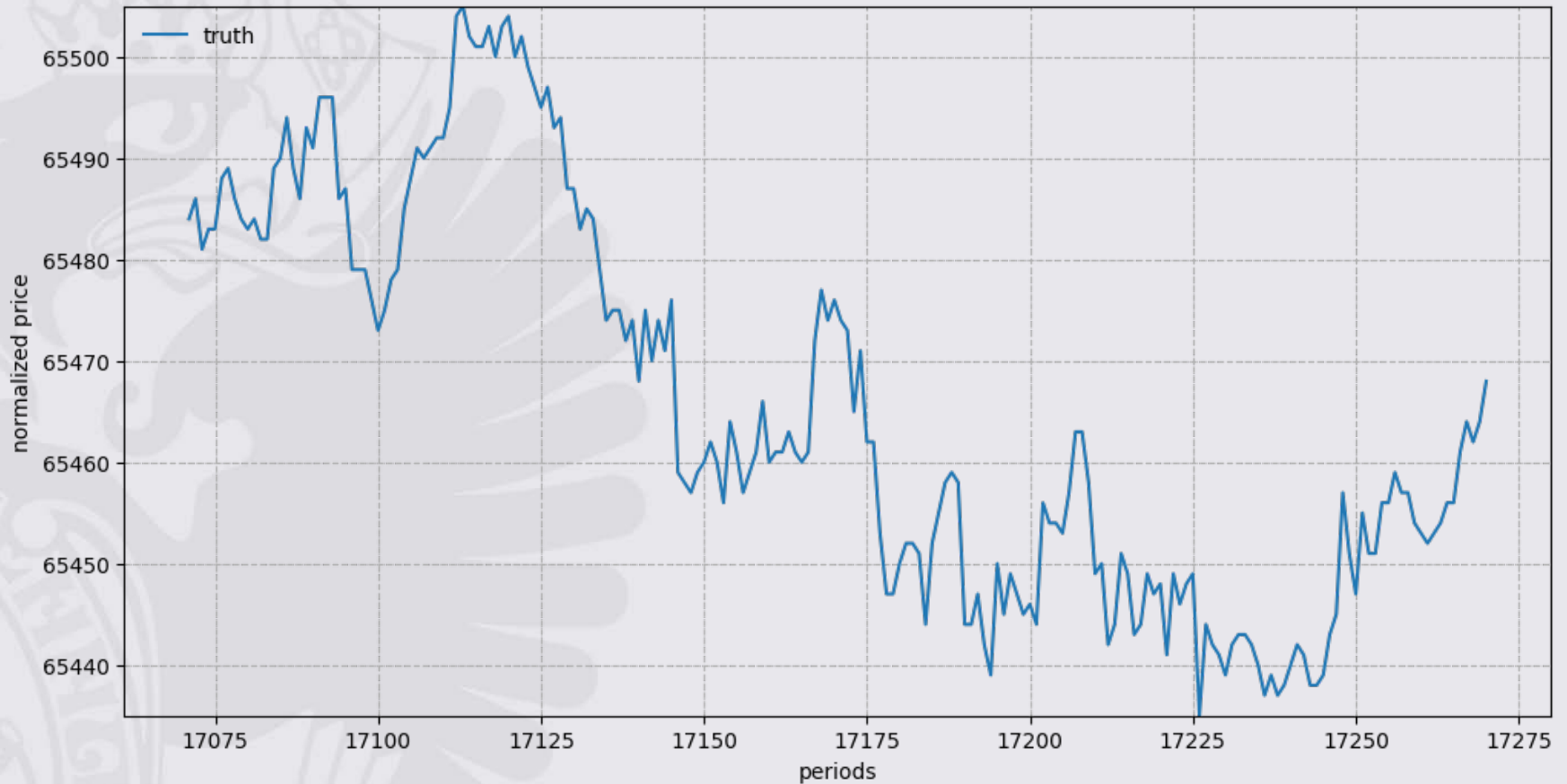
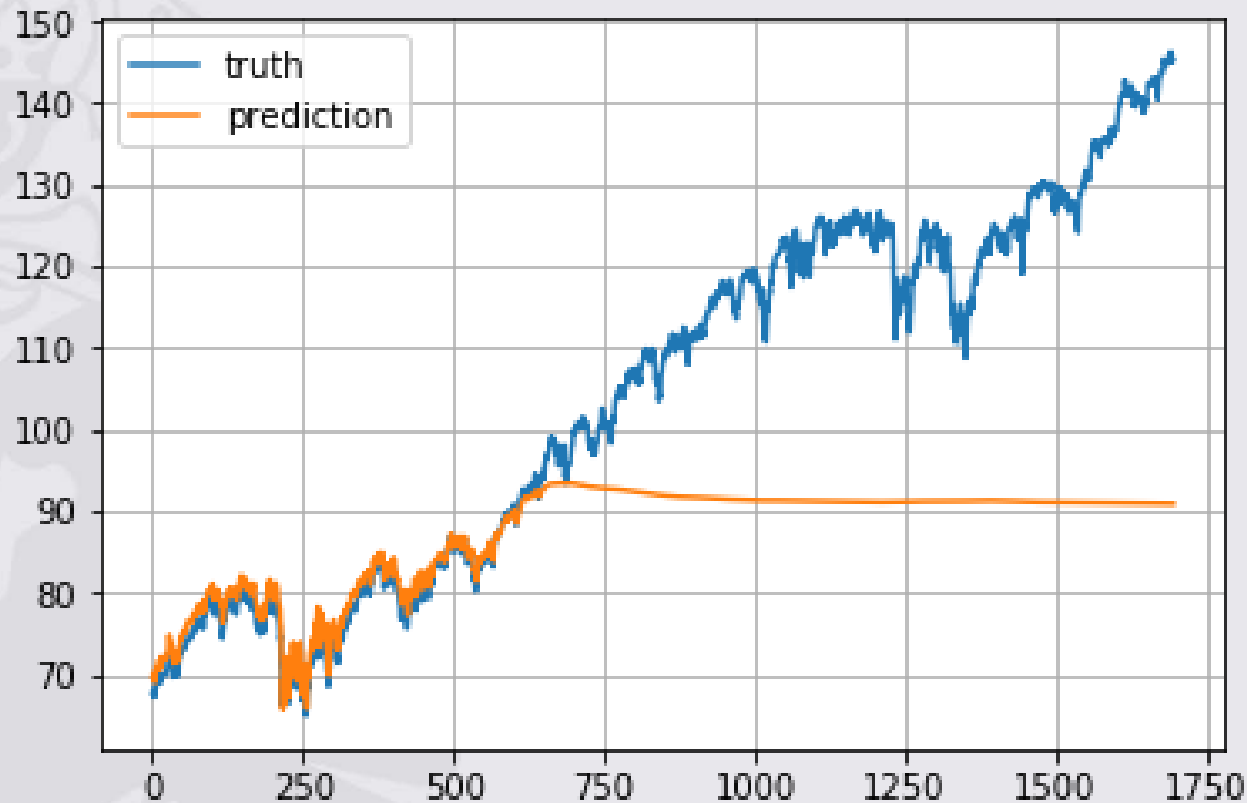Essentially we try to learn an approximation function:
$f(W0,W1,…,Wt) \approx Wt+1 f(W0,W1,…,Wt) \approx Wt+1$
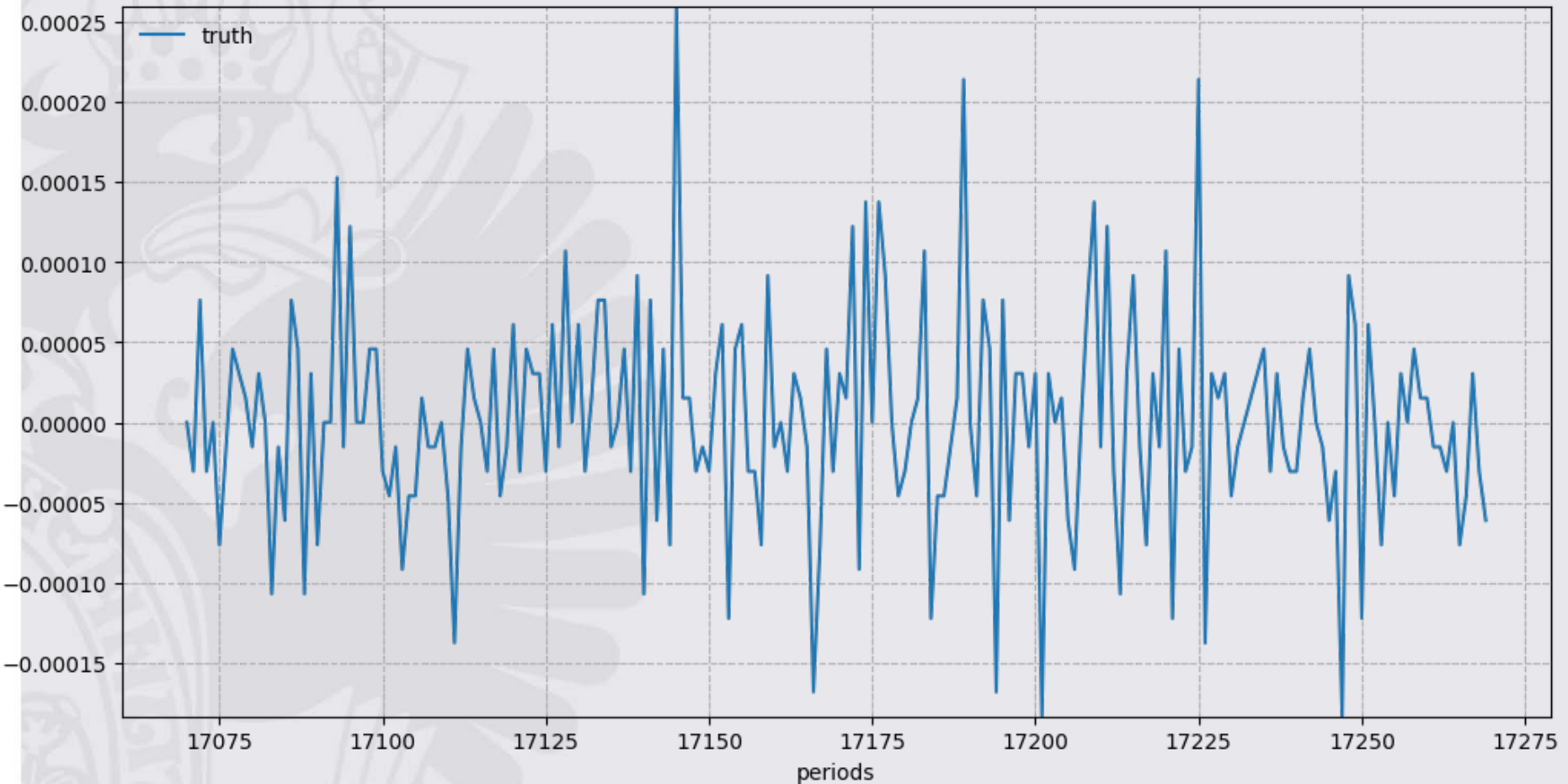
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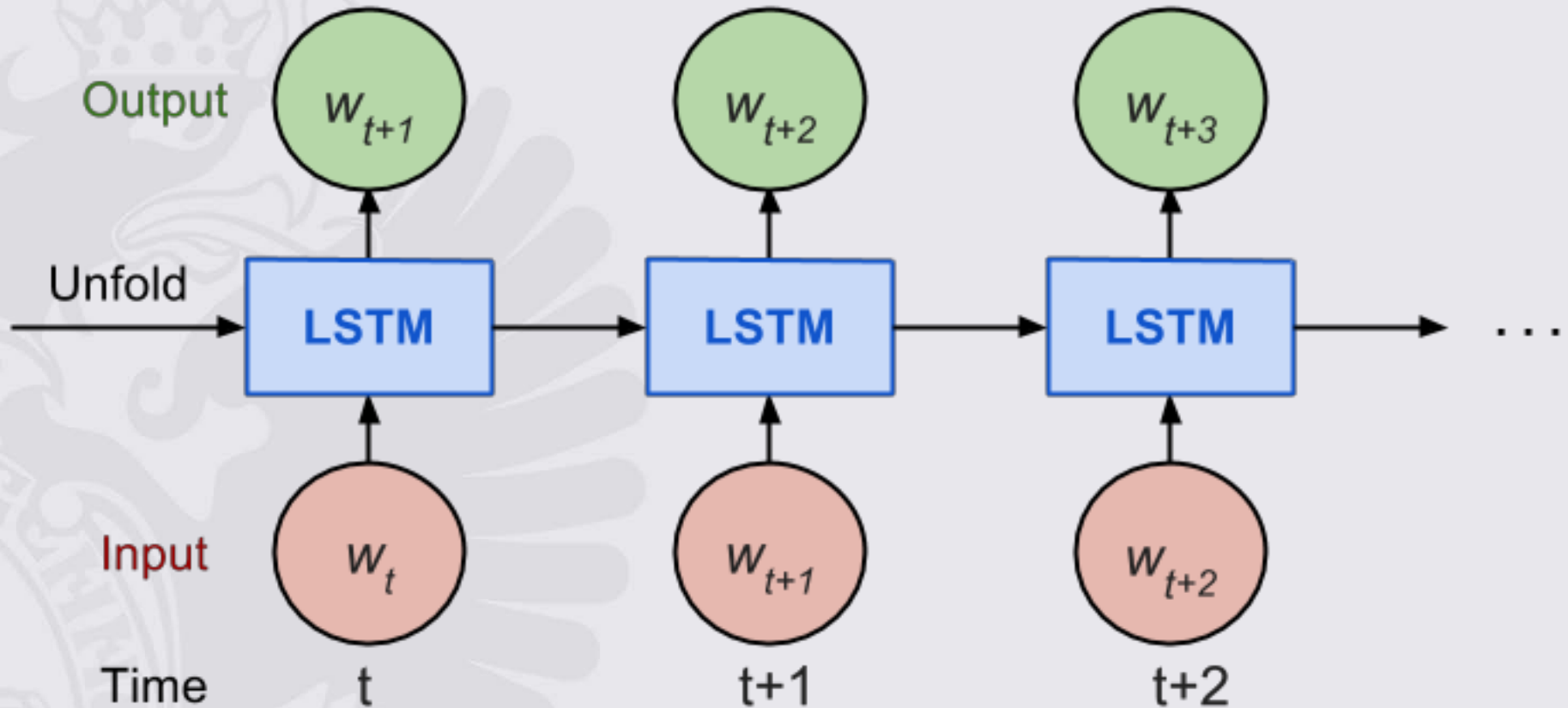
Si-6.16

Prediction without normalization

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Si-6.16 (normalized)

Si-6.16

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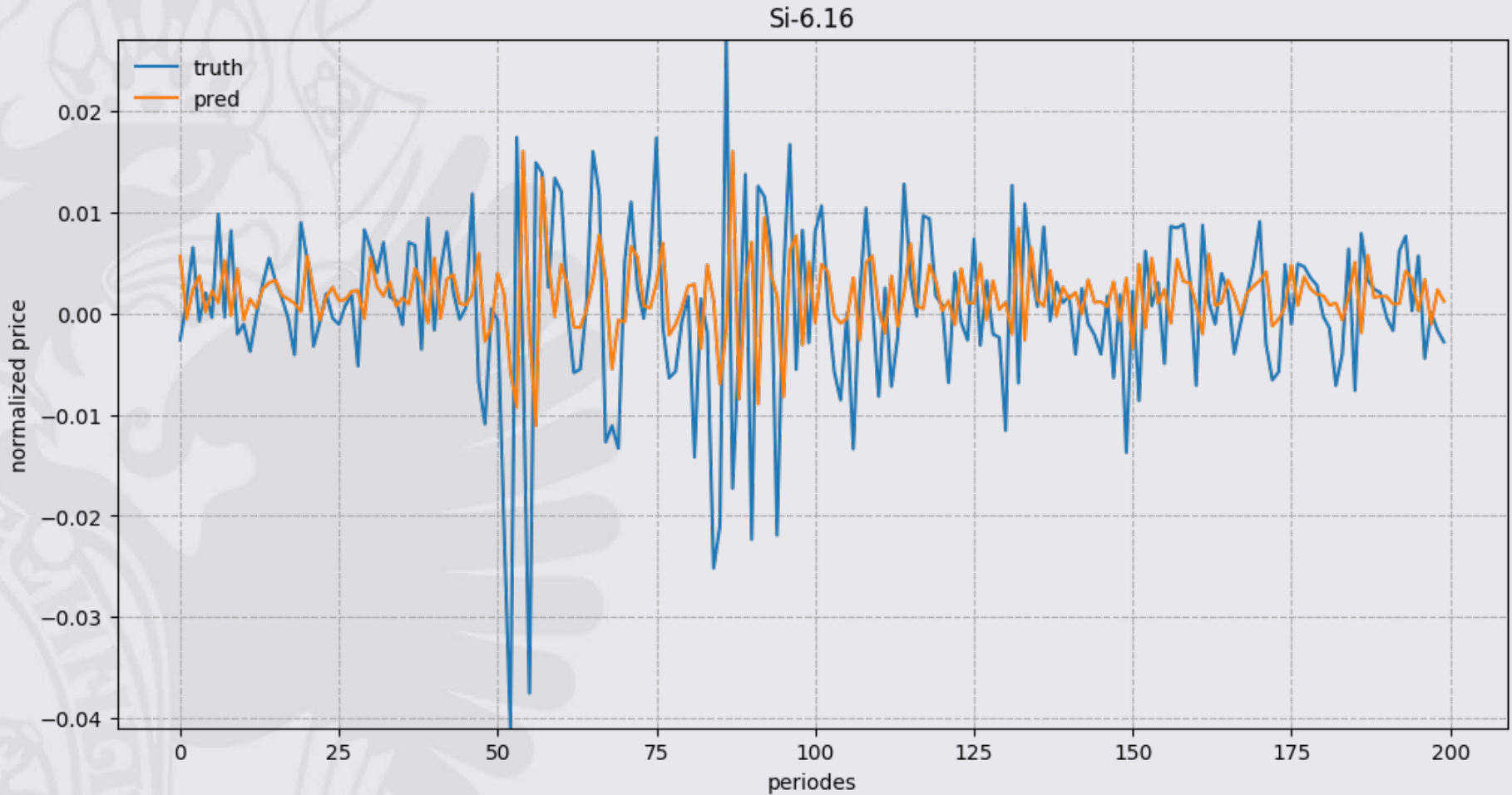
The accuracy of prediction of the price movement ≈ 62%

Any questions?

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