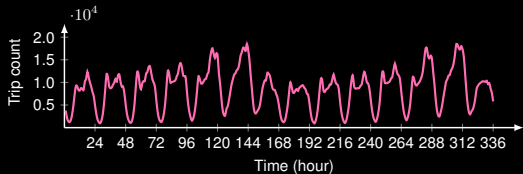


Essential Idea of Sparse Autoregression & Periodicity Quantification

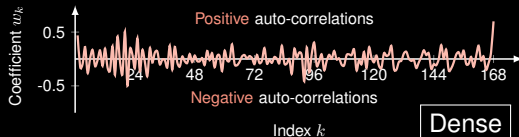
① Hourly ridesharing trip time series

(336 data points)



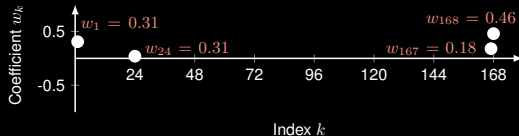
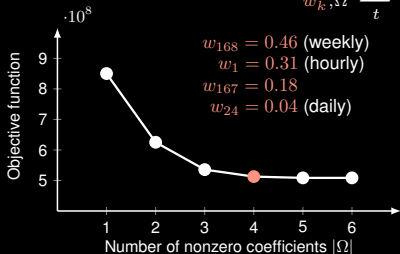
② Autoregression (order 168)

$$\min_{w_1, \dots, w_{168}} \sum_t \left(x_t - \sum_{k=1}^{168} w_k x_{t-k} \right)^2$$



③ Sparse autoregression

$$\min_{w_k, \Omega} \sum_t \left(x_t - \sum_{k \in \Omega} w_k x_{t-k} \right)^2 \quad \text{s.t. } |\Omega| \leq \tau, \tau = 1, 2, \dots$$



Dense

Sparse

Thanks for your attention!

Any Questions?

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