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Long term predictions for traffic forecasting
How does the accuracy degrade with time?

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1 Background

Long term:
- Sometimes > 30 minutes
- Sometimes > 1 day

Past research:
- LSTM often used for temporal correlations

2 Dataset

- Data from November 2019
- 11 intersections, 172 detection loops (sensors)
- 130 sensors for cars used, others are bicycles and trams
- 9.5 % 0 cars, 0.36% null values

3 Methodology

- Shifting time horizon up to 10 hours
- First predicting a single sensor
- Then predicting all 130 sensor

Evaluation:
- RMSE and SMAPE
- Comparing different time horizons against baseline of 15 minutes
- Comparing metrics for each hour of the day

5 Findings

- Longer time horizon -> lower predictions
- Longer time horizon -> RMSE increases consistently

- SMAPE improved after a longer time horizon
- SMAPE impacted by hours with low traffic
- RMSE impacted by hours with high traffic

4 Results
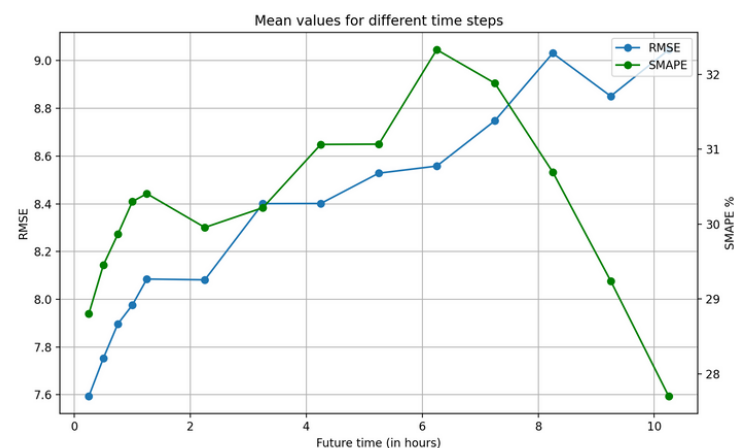
Average	Actual	1 timestep	21 timesteps	41 timesteps
Amount of cars	40.0	39.8	39.7	38.9
Difference per hour	–	-0.09%	-2.5%	-2.8%

130 sensors - 1 timestep

130 sensors - 41 timesteps
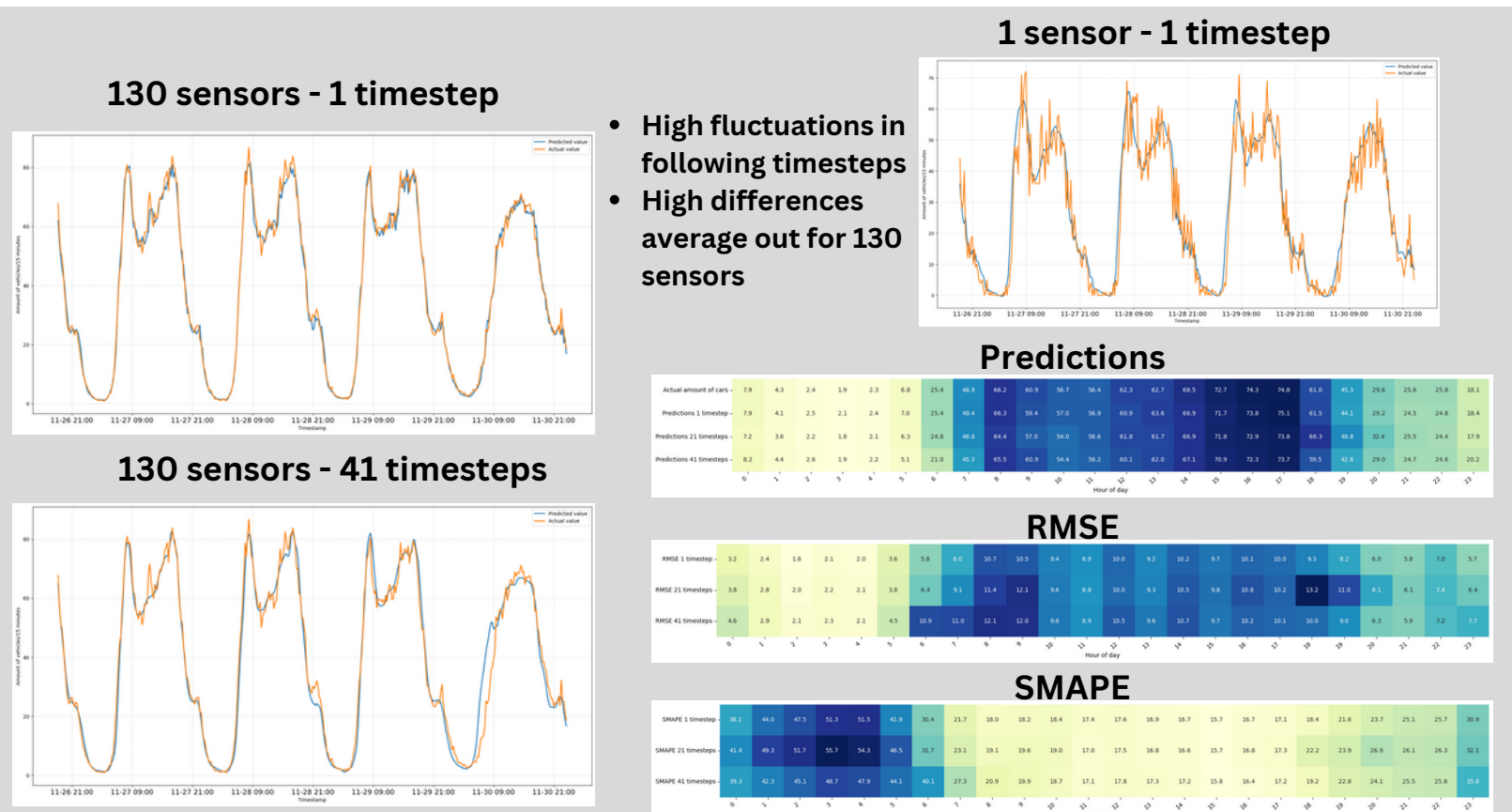
- High fluctuations in following timesteps
- High differences average out for 130 sensors

1 sensor - 1 timestep

Predictions

RMSE

SMAPE

6 Limitations and future work

- 1 month of data
- Aggregated by 15 minutes, could be smaller

- Work with more data
- Implement external factors
- Improve parameters of LSTM