Karlsruhe Institute of Technology

Transformer Neural Networks for Building Load Forecasting (TCCML@NeurIPS 2022)

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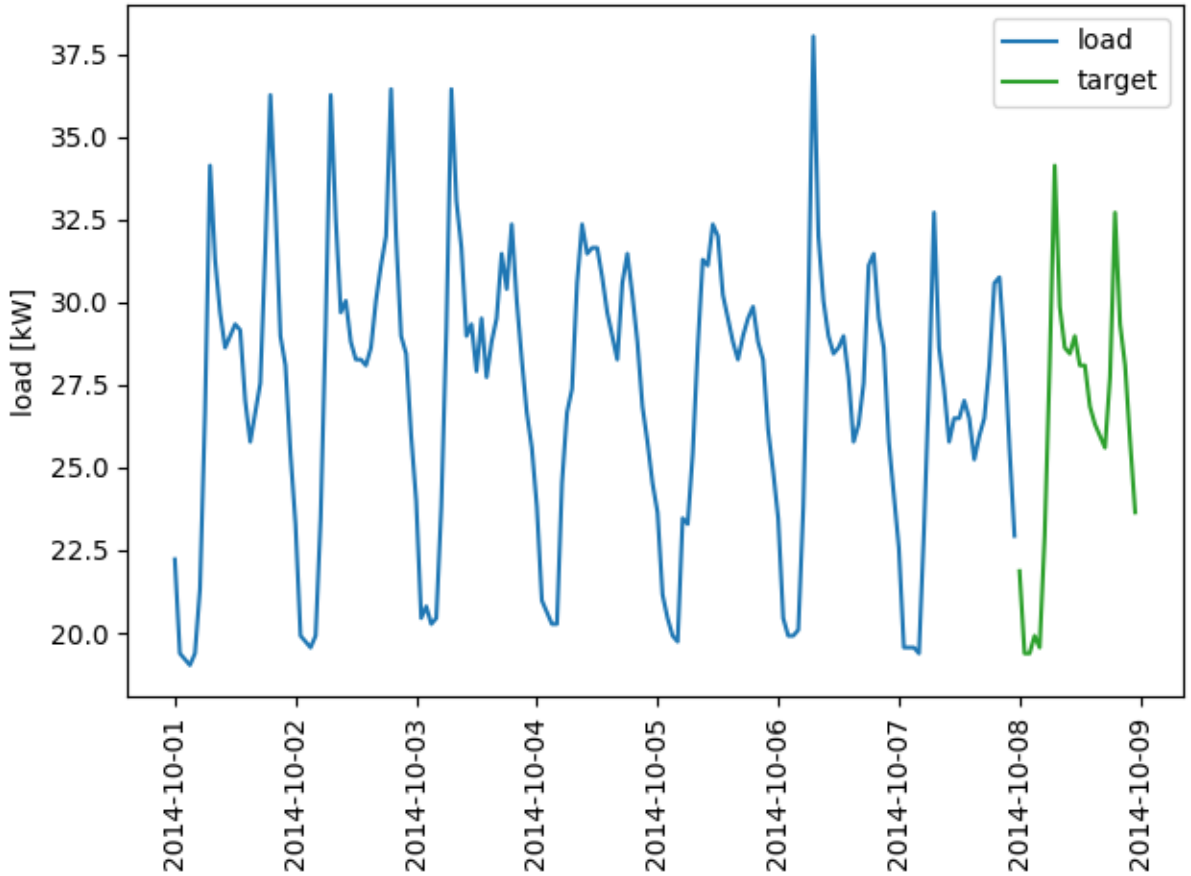
Building Load Forecasting

- Given: hourly electricity consumption (load) of the last week, calendar and time features
- Goal: predict load of next 24 hours
- Applications:
  - Optimal building control
  - Smart electric vehicle charging
  - Demand-side management



Experimental setup

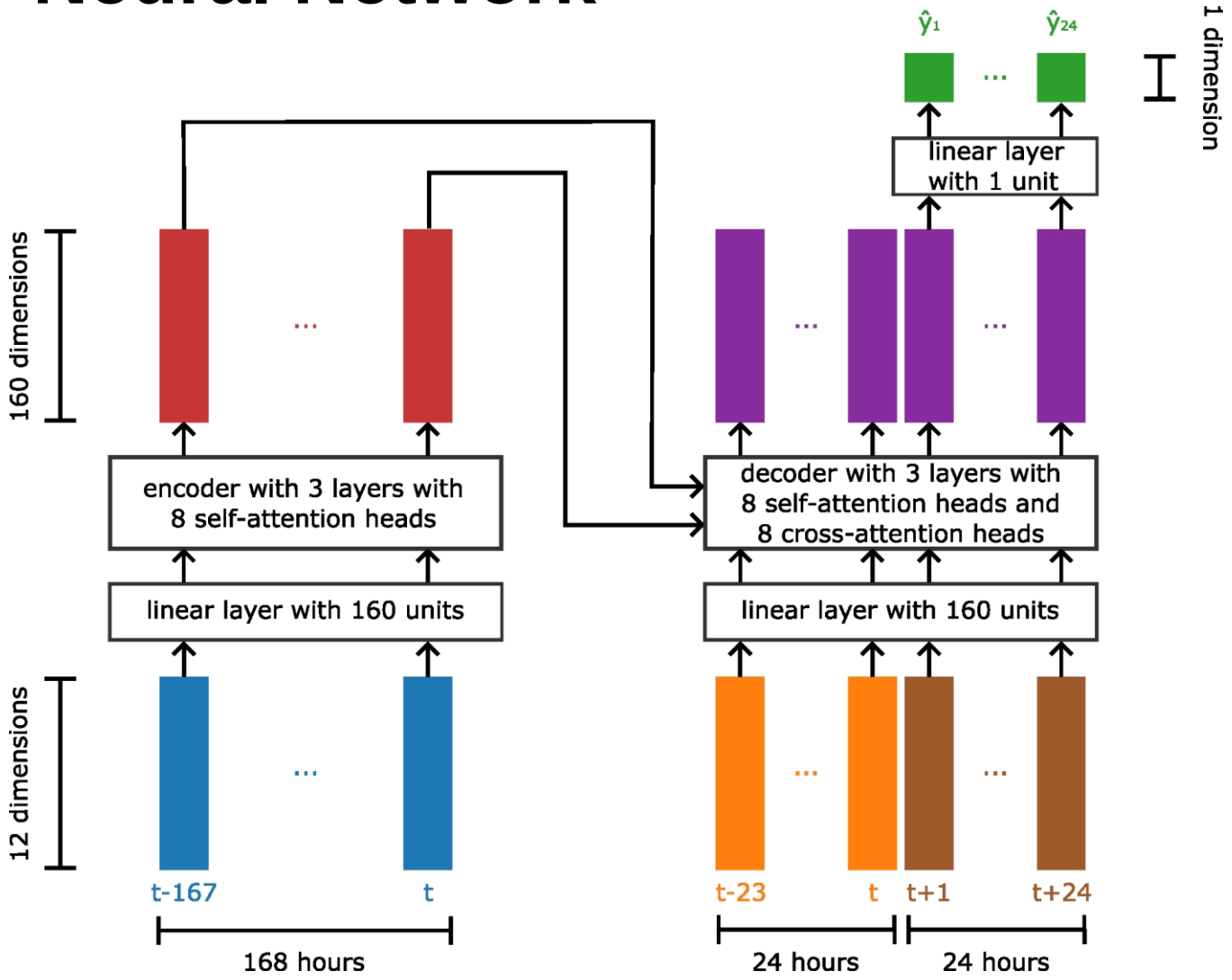
Research questions

1. How well do Transformer neural networks forecast building load?
2. Are local models better than global models?
3. How well do the models generalize to new buildings?

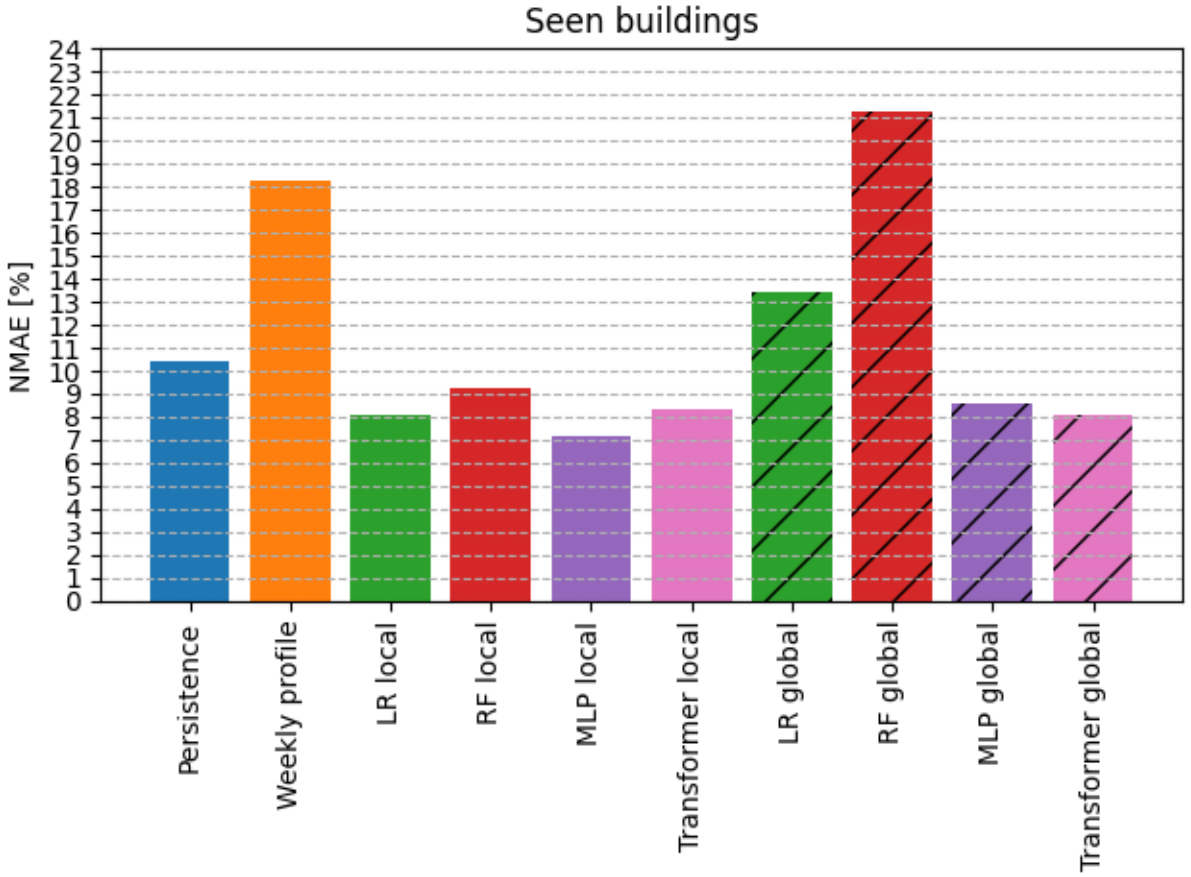
Dataset: 296 buildings from public UCI dataset, 2-4 years data

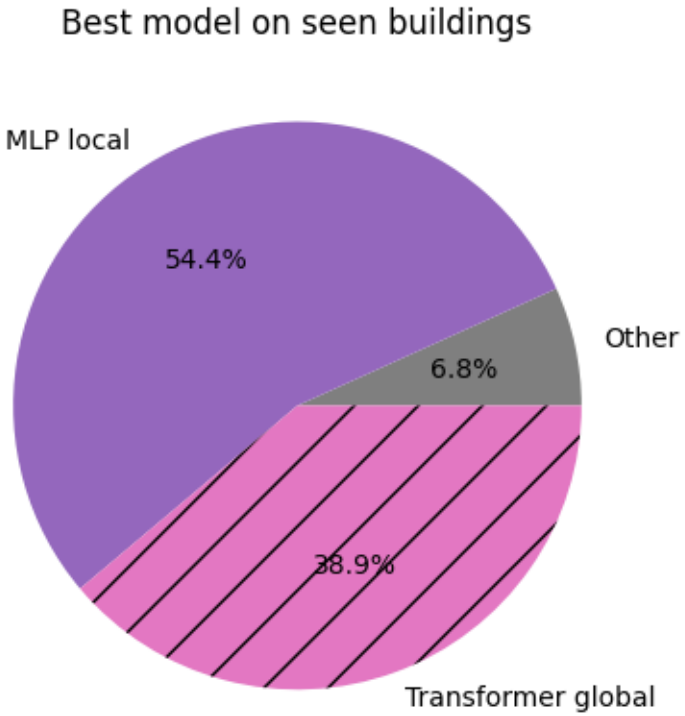
Metric: normalized mean absolute error (NMAE)

Transformer Neural Network

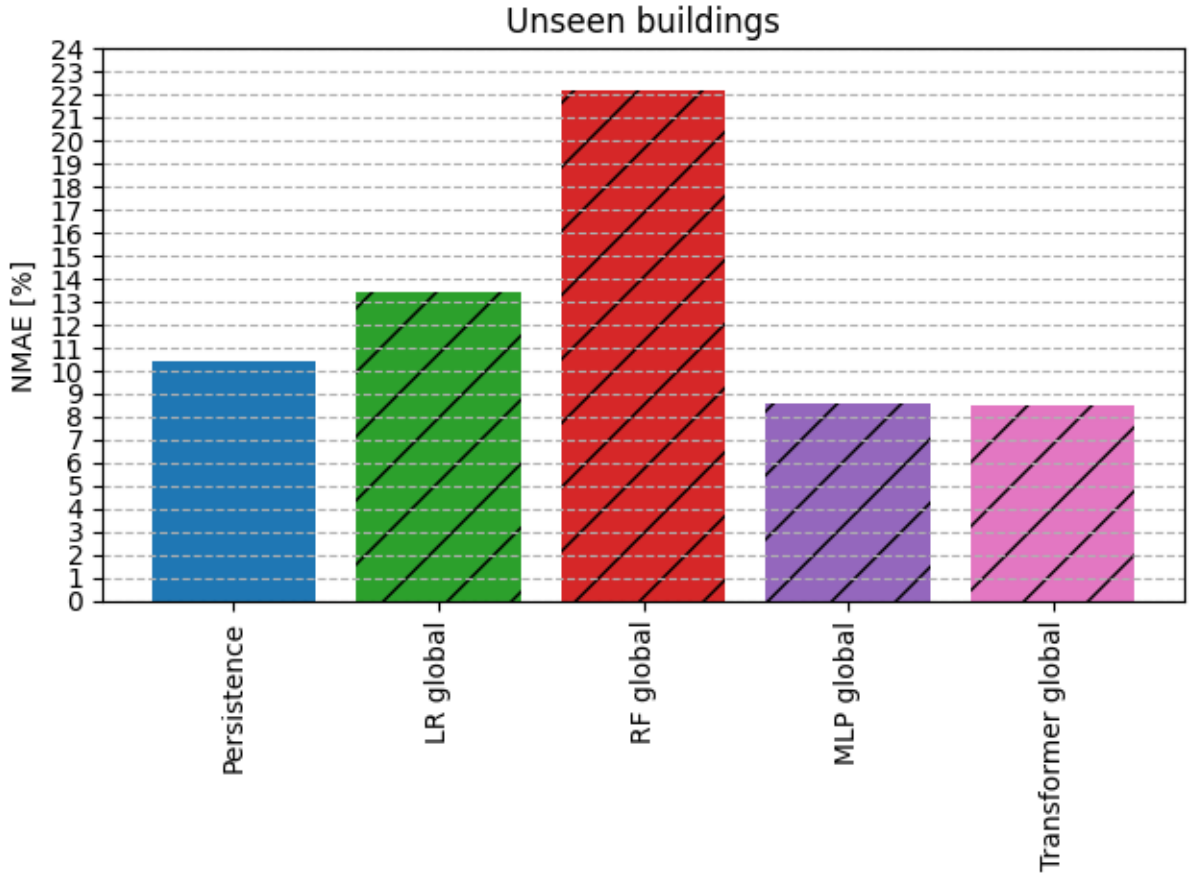


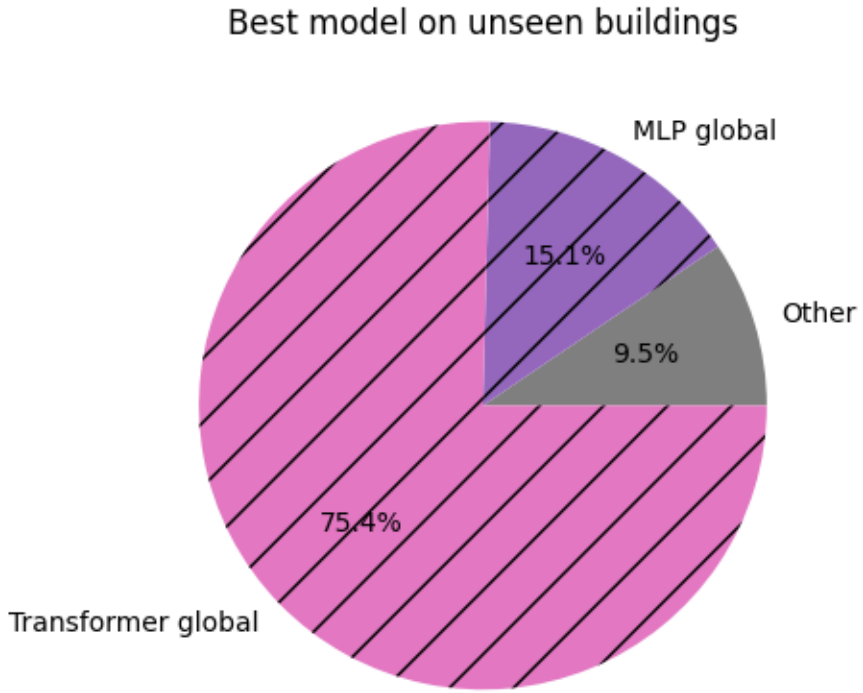
Results: Buildings seen during training





Results: Generalization to unseen buildings





Conclusions and future work

1. Transformer best on many seen and majority of the unseen buildings.
2. Local models better than global models.
3. Global models generalize well to unseen buildings.

- Characterization of buildings where Transformer is best
- Weather data
- Interdependencies between buildings
- Other Transformer architectures
- Benchmark models on many datasets

Thank you!

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