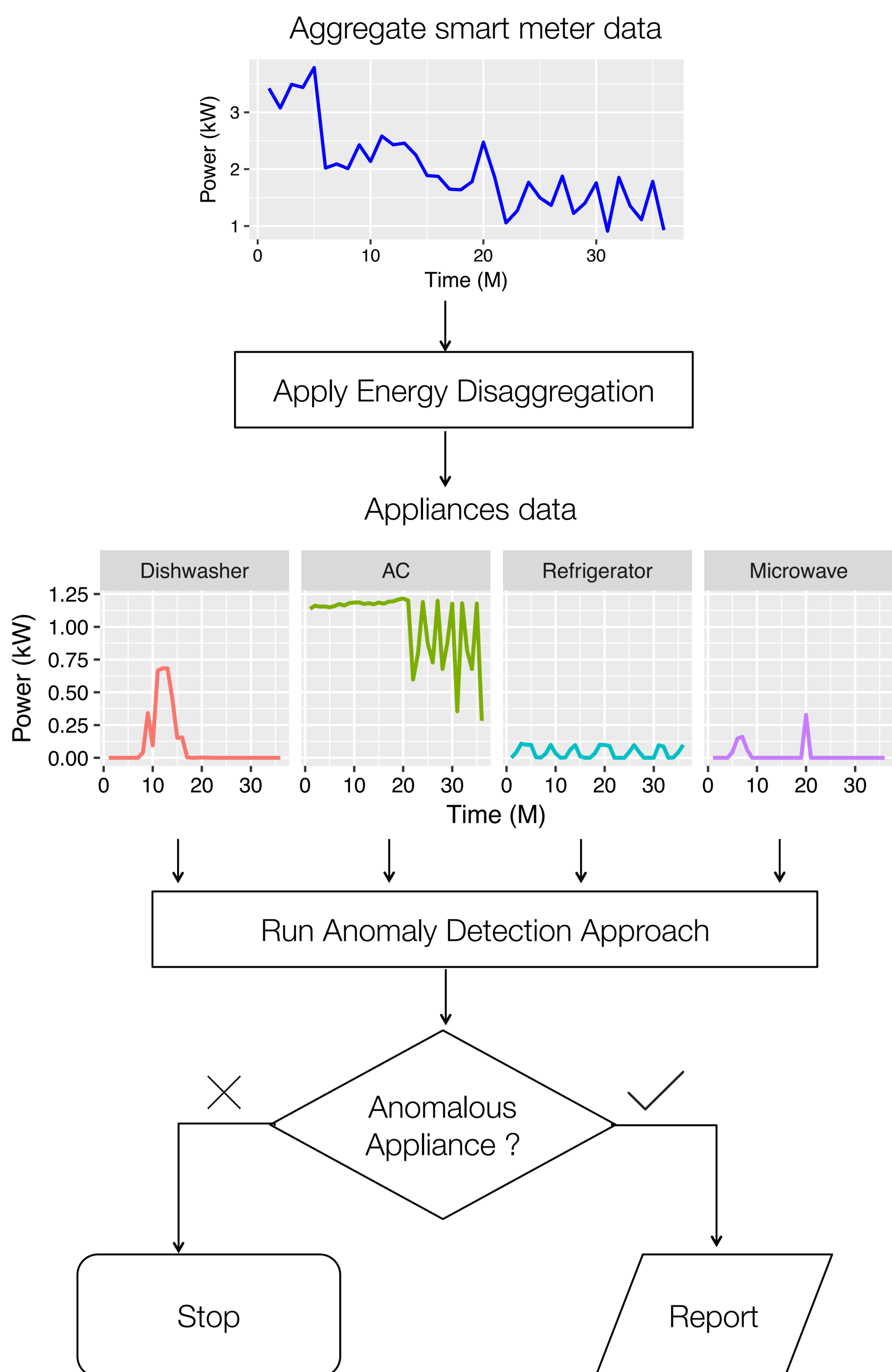


Energy Disaggregation for Identifying Anomalous Appliance

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QUESTION

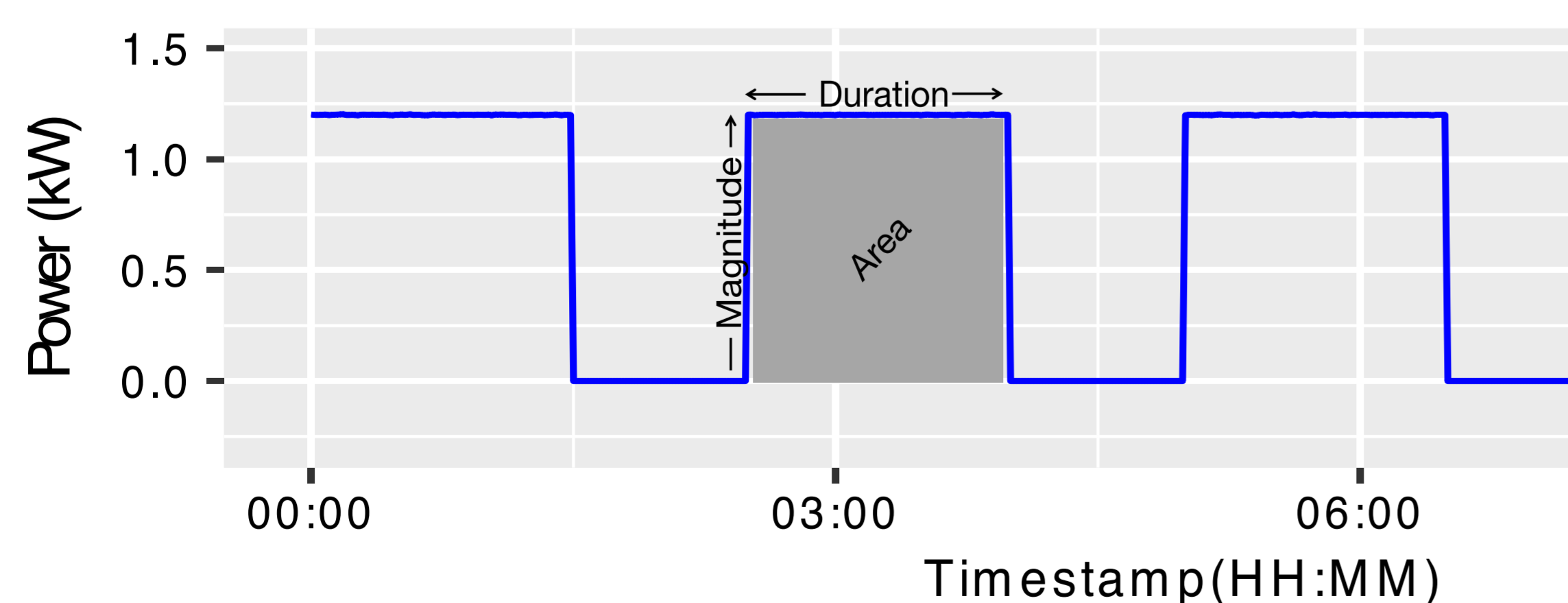
Is disaggregated appliance data good enough for appliance's anomaly detection?



APPROACH

Training phase (for each appliance)

- ▶ Compute and store statistics such as duration, magnitude, area, and standard deviation over area of different states



Testing phase (for each appliance)

- ▶ Compute and compare mentioned statistics with train phase statistics
- ▶ Flag anomalies, if any, using set of rules

EXPERIMENTAL SETUP

Dataset

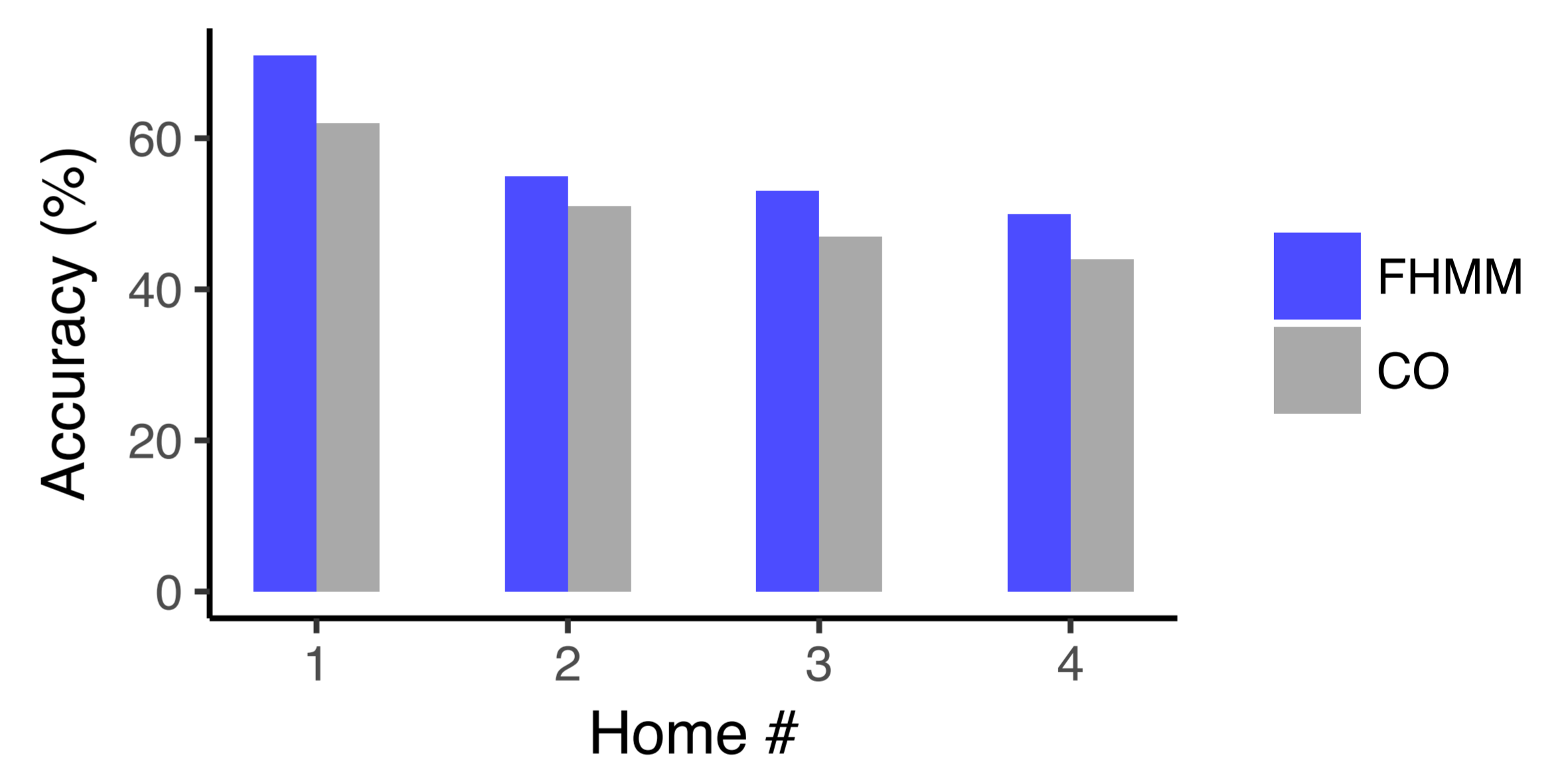
- ▶ 4 homes
- ▶ 3 months minutely data
- ▶ Both aggregate and sub-metered

Disaggregation techniques

- ▶ Factorial Hidden Markov Model (FHMM)
- ▶ Combinatorial Optimization (CO)

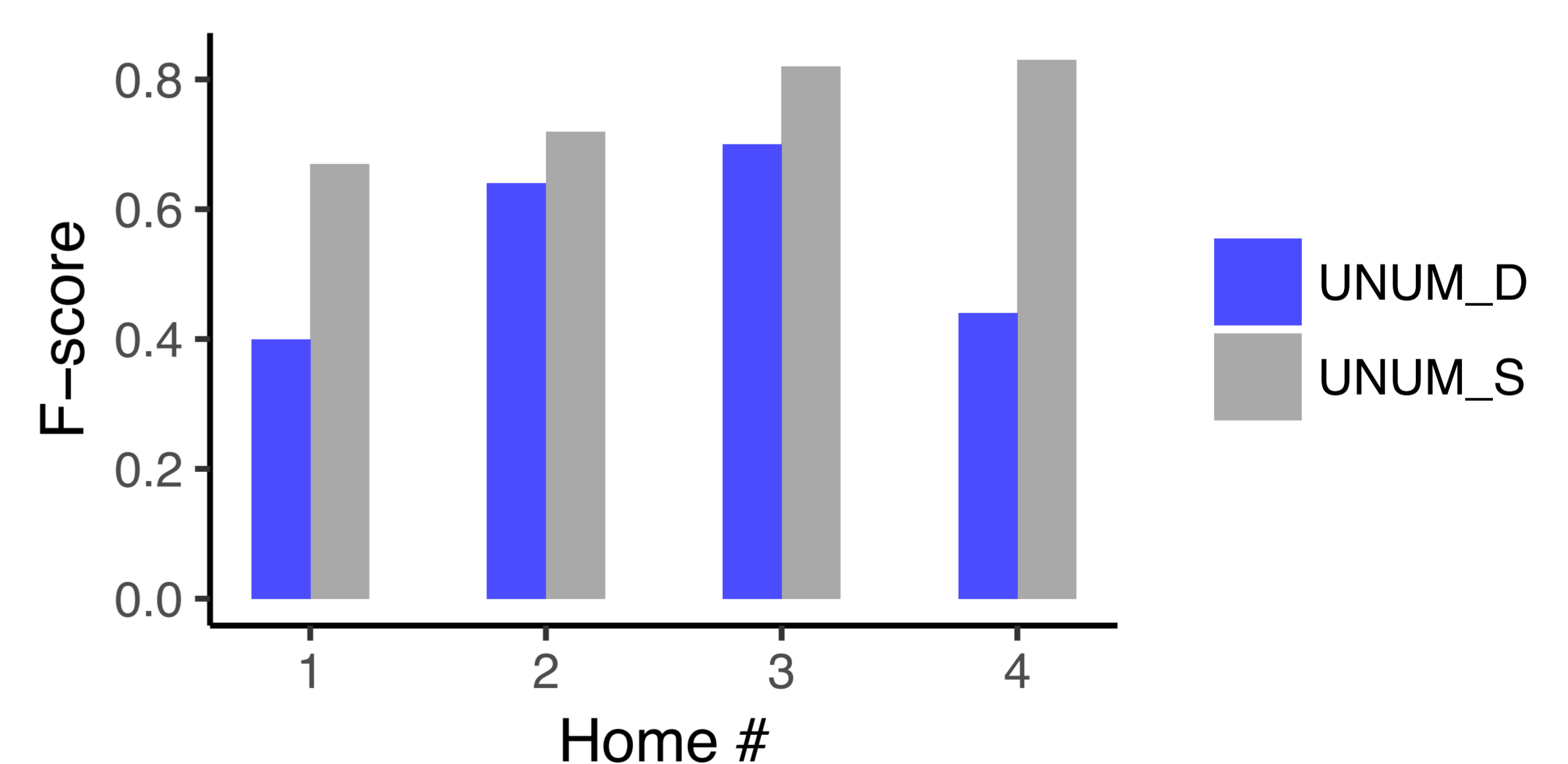
RESULTS

Disaggregation Accuracy



F-score, AC

UNUM_D: Anomaly detection using disaggregated data
UNUM_S: Anomaly detection using sub-metered data



F-score, Refrigerator

