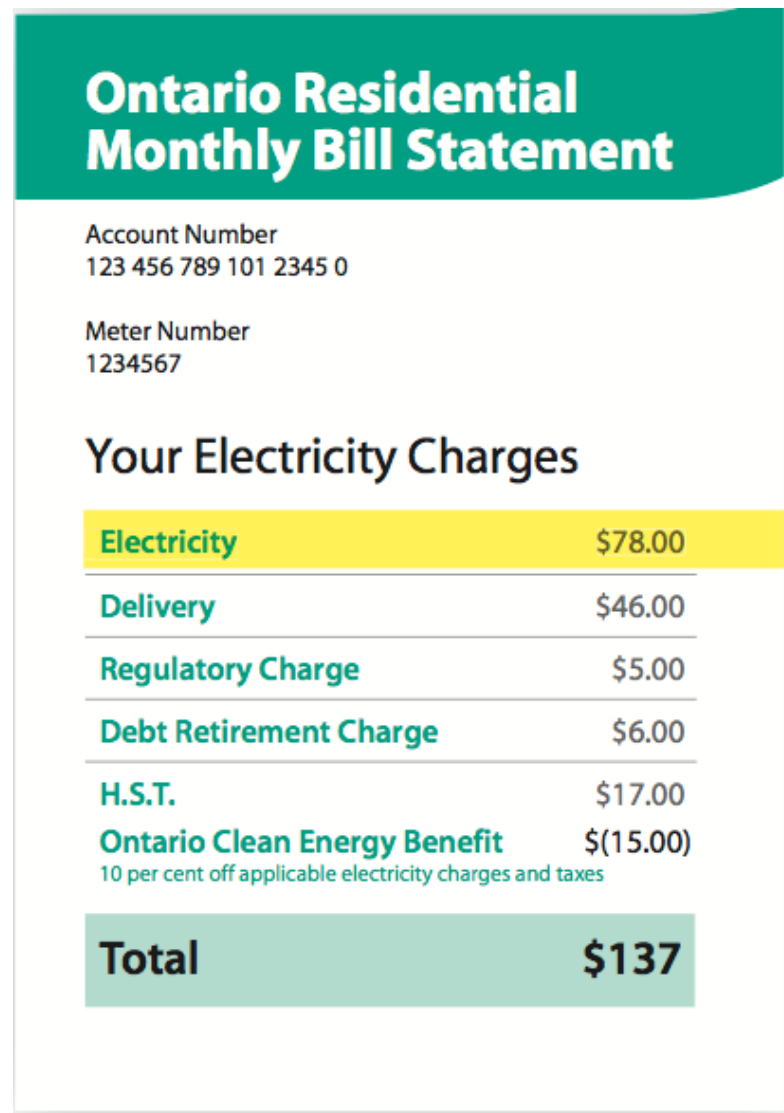


Gemello: Creating a Detailed Energy Breakdown from just the Monthly Electricity Bill

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Motivation



VS



Regular electricity bill

Itemised bill

Energy breakdown can help save up to 15% on energy bills

Key Insight

Estimate the energy breakdown by matching to similar homes with known breakdown

Related Work



Plug load monitor



Circuit level monitor



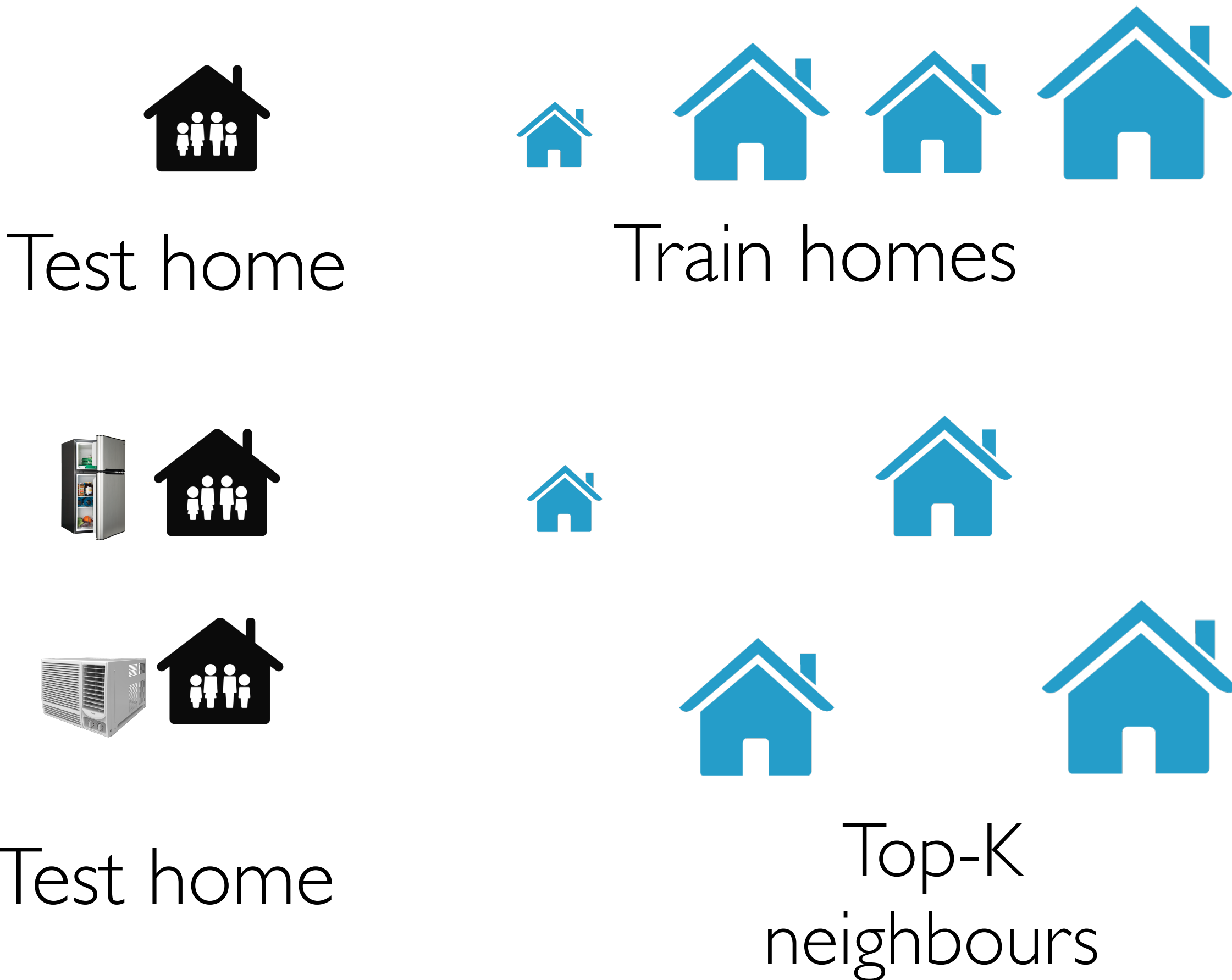
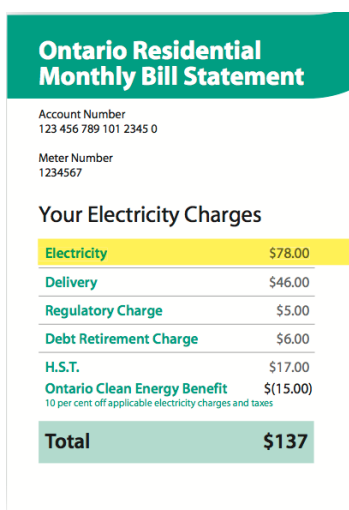
Smart meter

Existing solutions for energy breakdown require sensors in each home

Approach - Matching

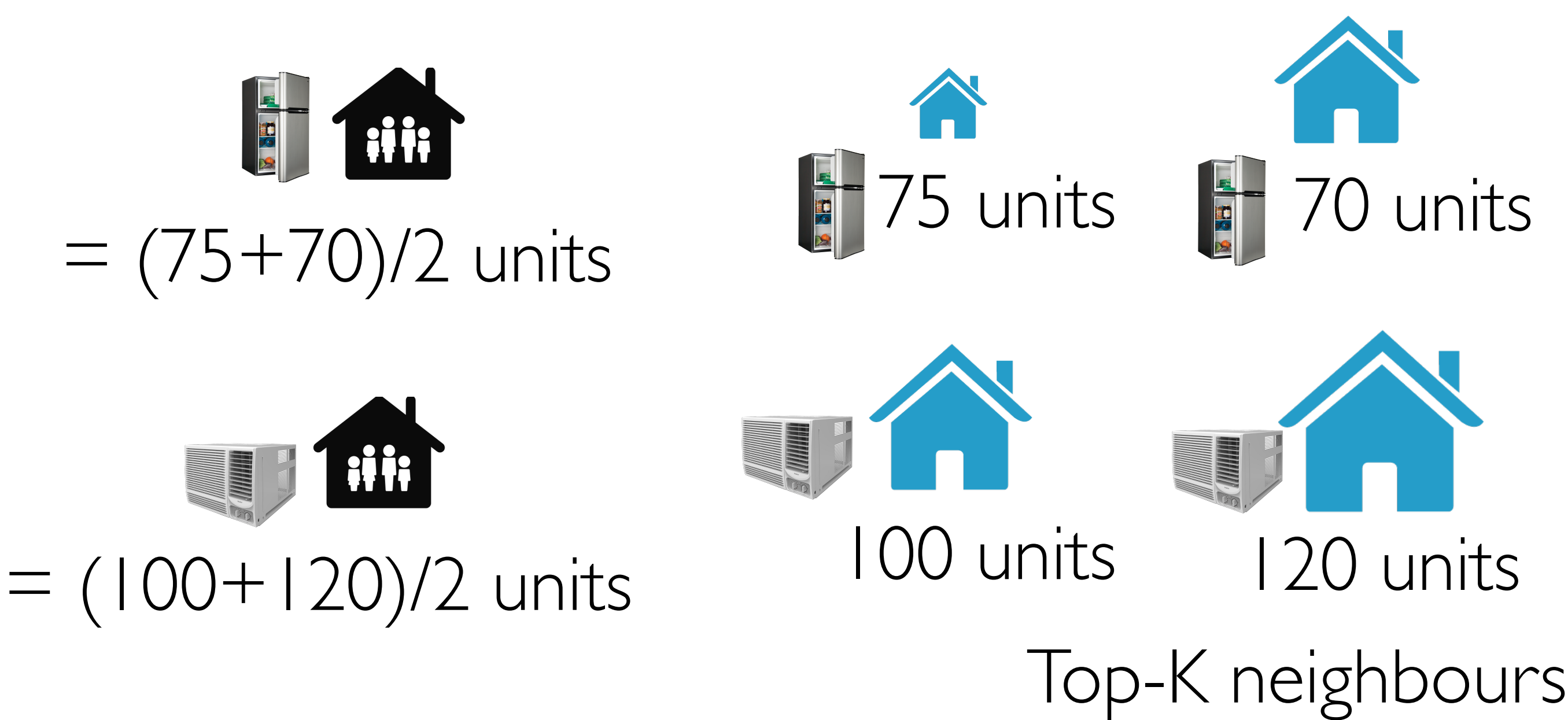


Similarity between homes is defined based on easy to collect features such as #occupants and historical monthly electricity bills



Find the top-K neighbours on a per-appliance basis

Approach - Prediction

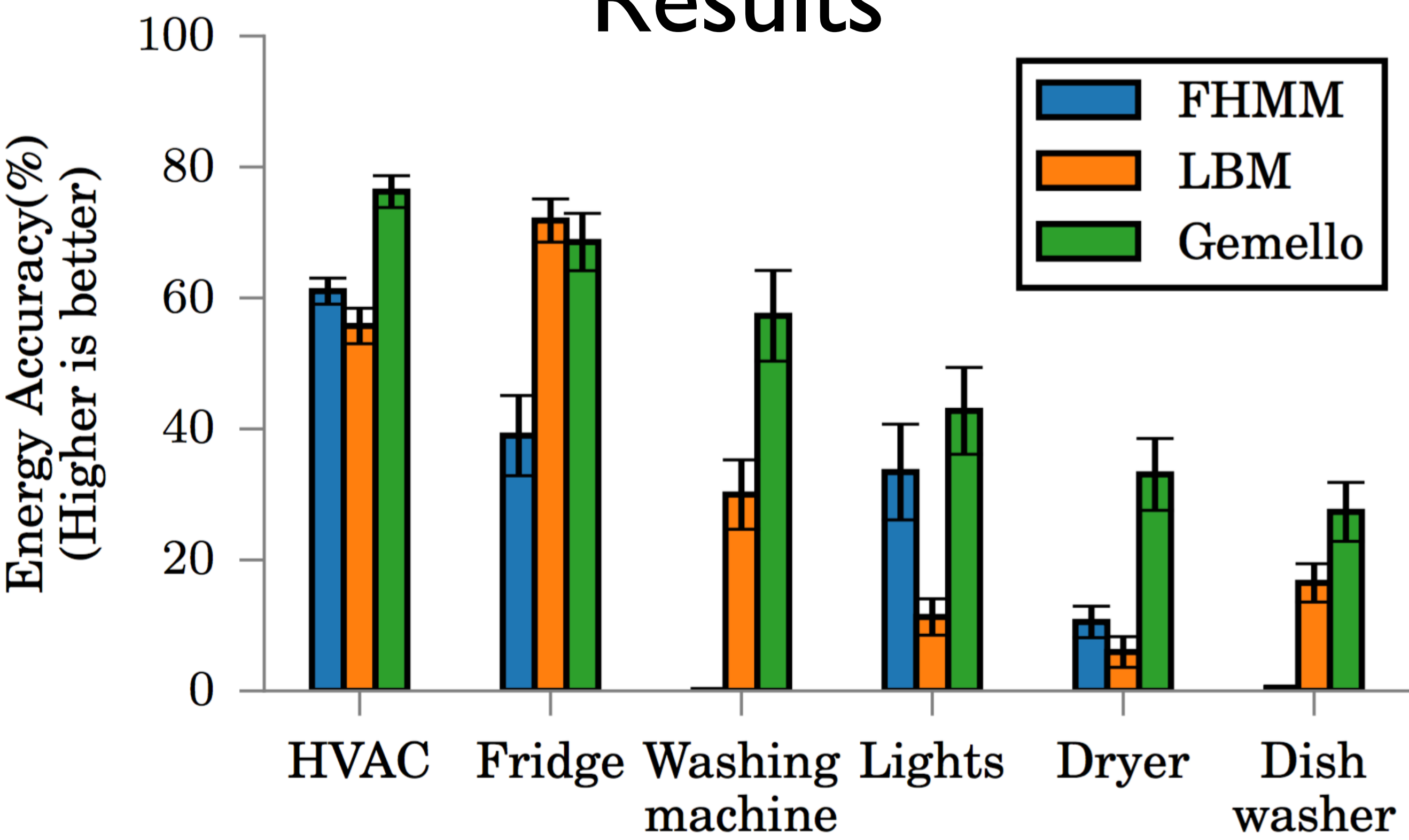


Predict the appliance energy consumption of test homes based on top-K neighbours

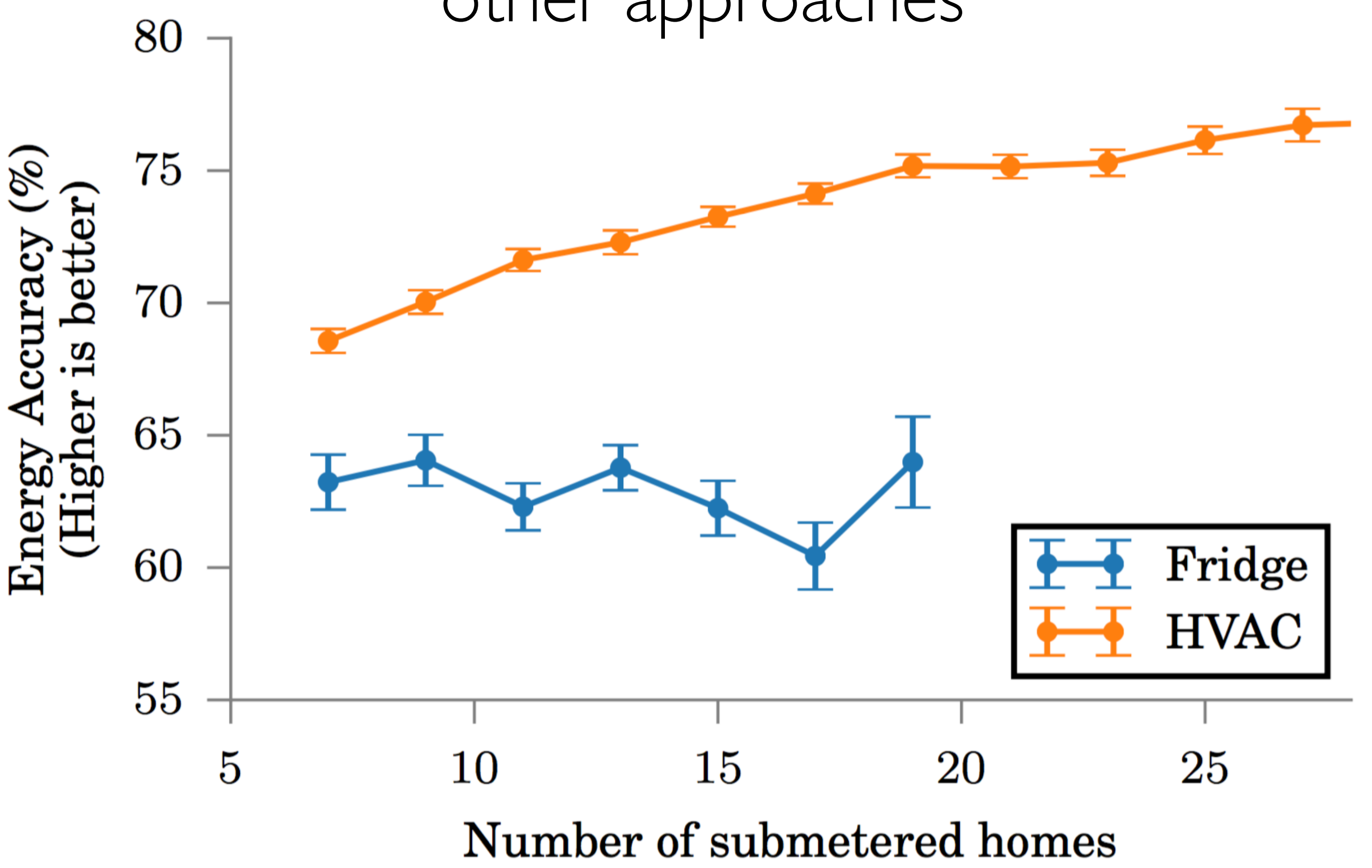
Appliance-wise Optimum Features

HVAC	Aggregate energy in summer
Fridge	Area, Range of 12 month electricity bills
Washing machine	Area, #rooms
Lights	Area
Dryer	#occupants, Area

Results



Gemello can be more than twice as accurate as other approaches



Gemello is highly accurate even with small fraction of instrumented homes