A SNAPSHOT OF NILM

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JUSTIN ELSZASZ

IEPEC INTERNATIONAL ENERGY PROGRAM EVALUATION CONFERENCE

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machine learning

Is it ready yet?

data

smart meters

 Confidential and Proprietary NAVIGANT

Let's give
it a try.

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We use fresh ingredients.

45 houses w. optical sensors / ~ 30 second resolution

23 houses submetered / ~ 60 second resolution

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Training Data + Machine Learning = NILM Algorithm

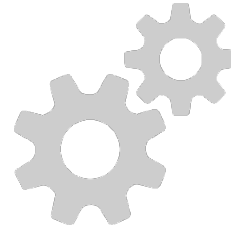$$\text{Training Data} + \text{Machine Learning} = f(x)$$

Training Data + Machine Learning = NILM Algorithm

$f(x)$

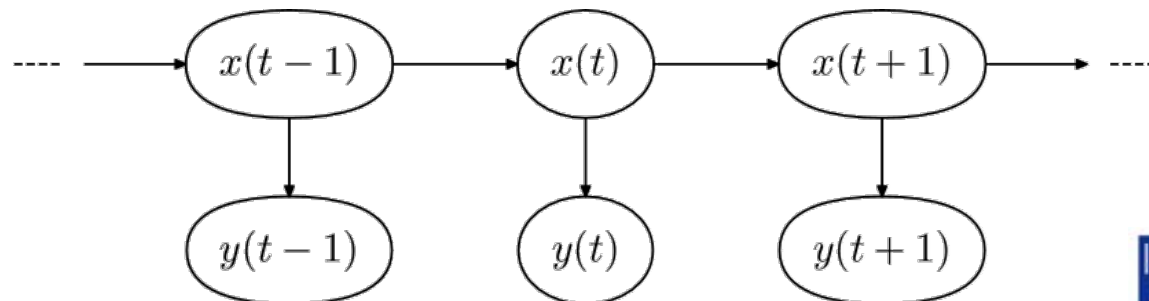While we're at it, let's try a few recipes.

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"Secret Recipe"

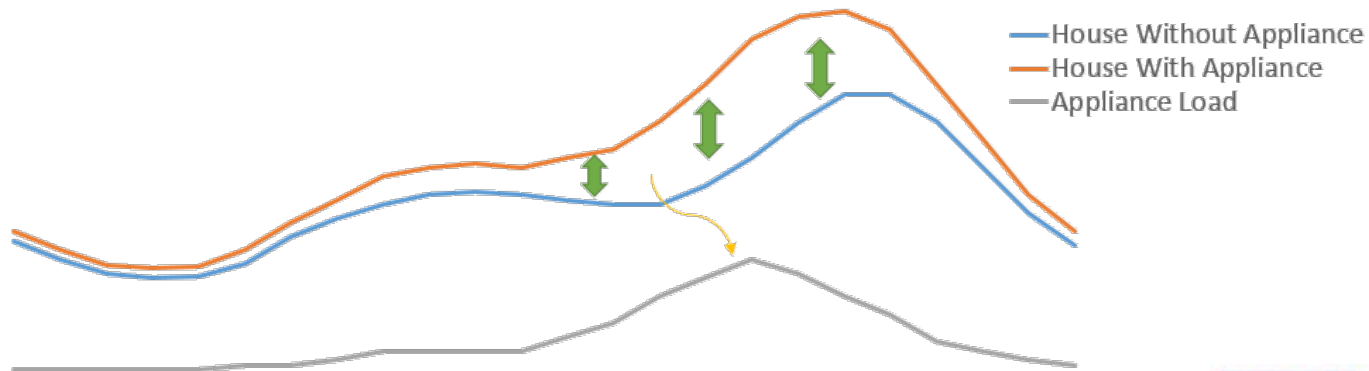Partnered with NILM software company to evaluate their algorithm.

"As Seen on Pinterest®"

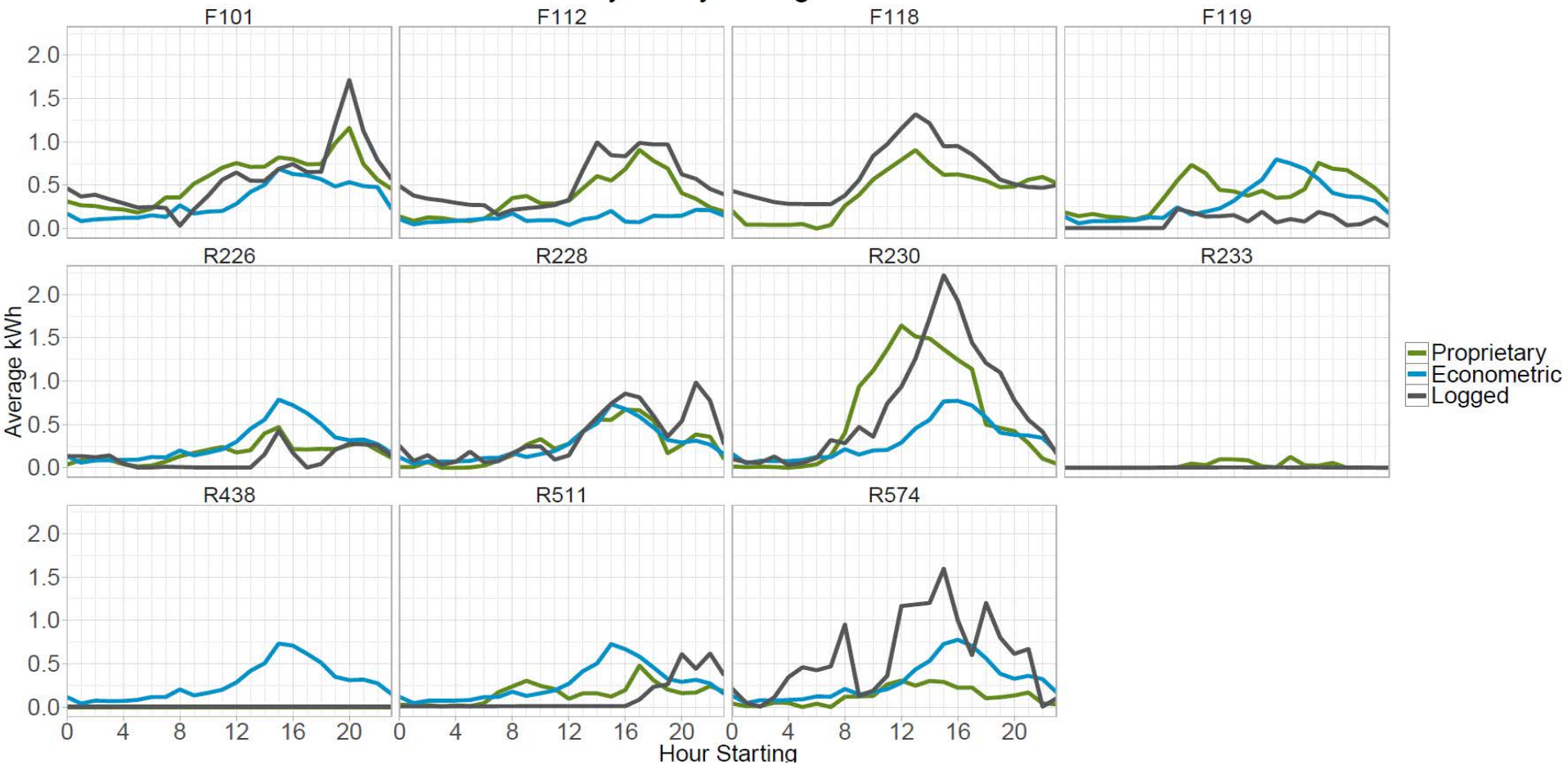Open-source algorithm "SparseNILM" developed by Steven Makonin.

"Grandma's Homemade"

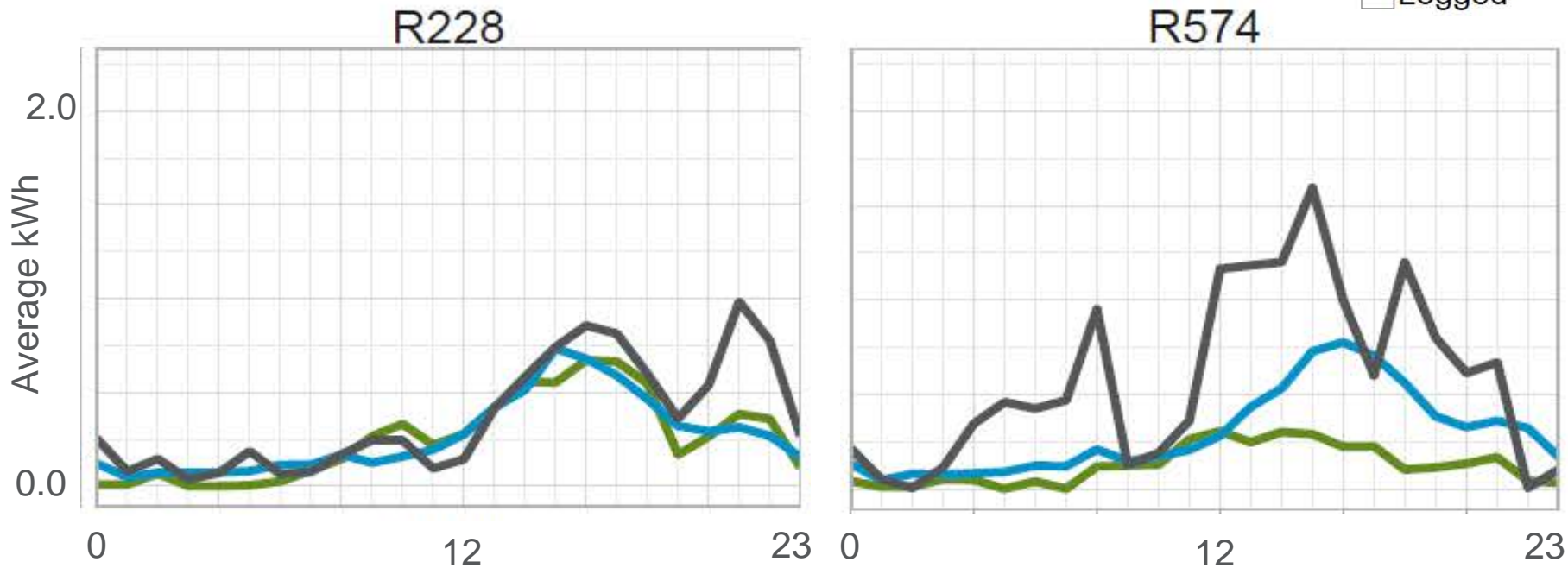## Implemented an established econometrics model.

Legend:
- House Without Appliance
- House With Appliance
- Appliance Load

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NILM Weekday Hourly Averages for Central AC

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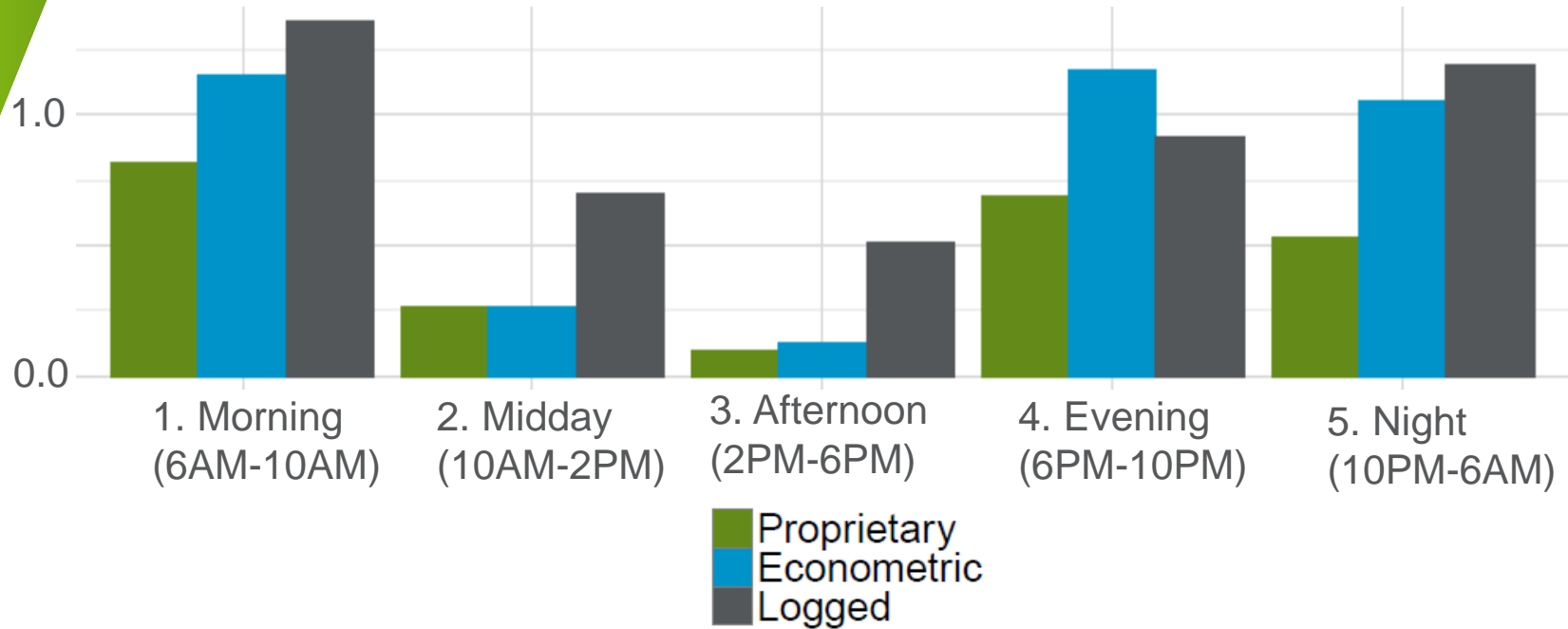
Central AC Hourly Averages (Sites)

$$CV = \frac{\sigma}{\mu}$$

$$CV_{mean} = \frac{RMSE_{mean}}{\bar{y}_{logged}} = \frac{\sqrt{\frac{\sum_{i=1}^{n}(y_i - \bar{y}_{logged})^2}{n-1}}}{\bar{y}_{logged}}$$

$$CV_{disagg} = \frac{RMSE_{disagg}}{\bar{y}_{logged}} = \frac{\sqrt{\frac{\sum_{i=1}^{n}(y_i - \hat{y}_i)^2}{n-1}}}{\bar{y}_{logged}}$$

CV Comparison for Central AC (Weekend)

1. You need some "ILM" data.

2. Software providers may or may not help you cook.

3. "New" houses are still a challenge.

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THANK YOU

JUSTIN ELSZASZ

justin.elszasz@navigant.com

202.481.8667

linkedin.com/in/justinelszasz

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