

# Crowdsourcing Ground Truth for NILM



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# Limited Quantities

AMPds 2

REFIT

tracebase

greend

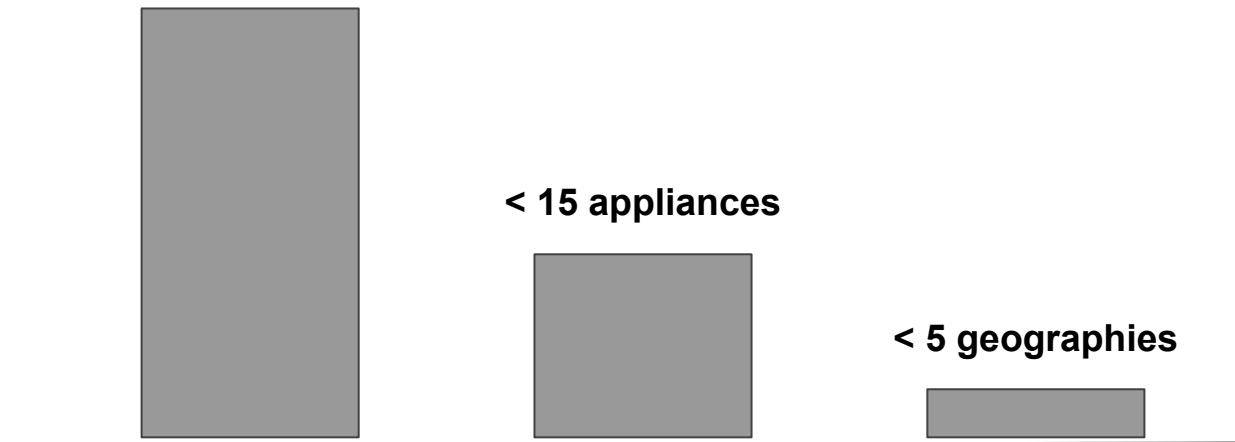
REDD

UK-DALE

< 100 homes

< 15 appliances

< 5 geographies



# Difficult and expensive

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**\$500 / home**

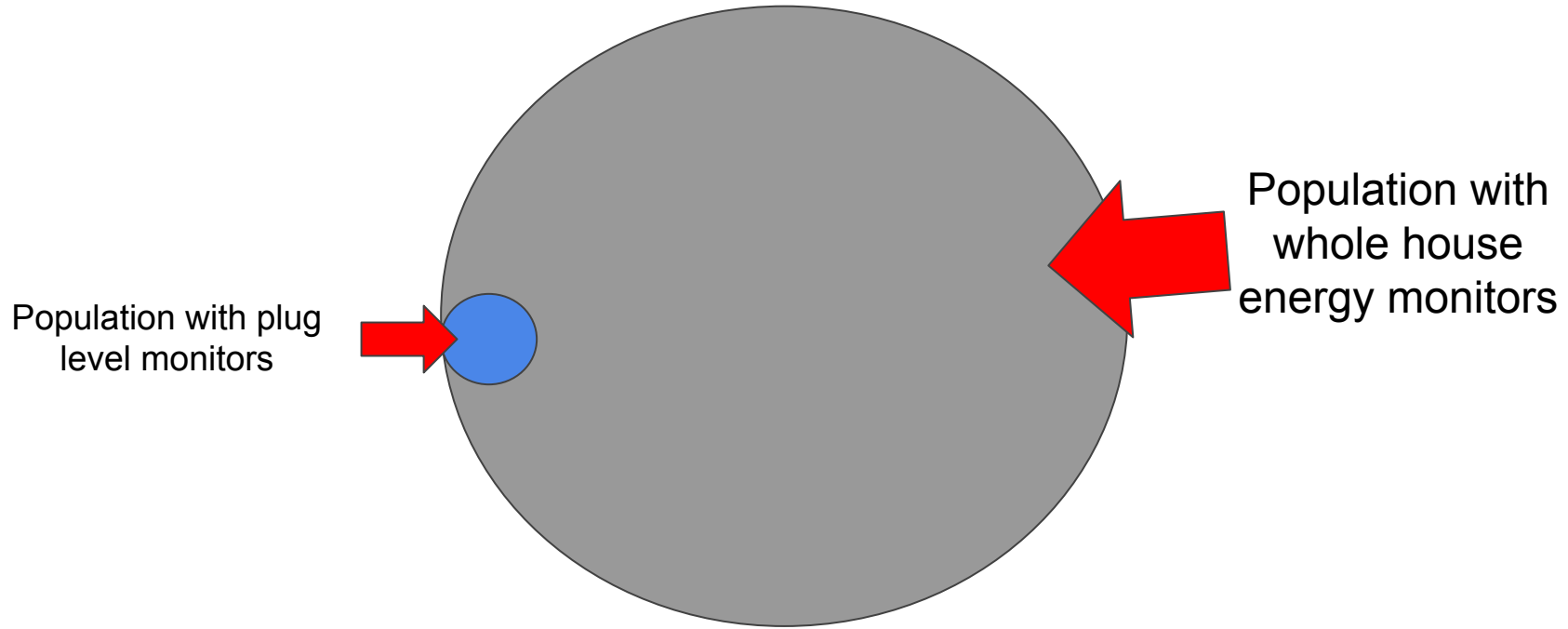
OR



**\$50 / plug**

# Can we tap into a larger information pool?

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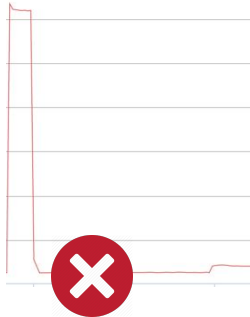


# Try 1: User initiated tagging

Tag



Expected



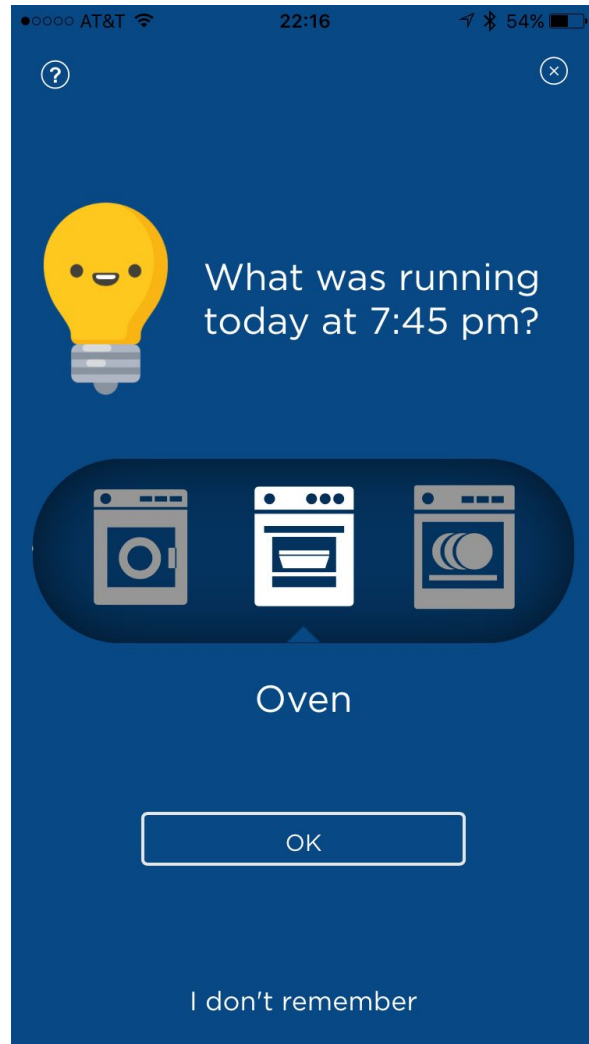
Actual



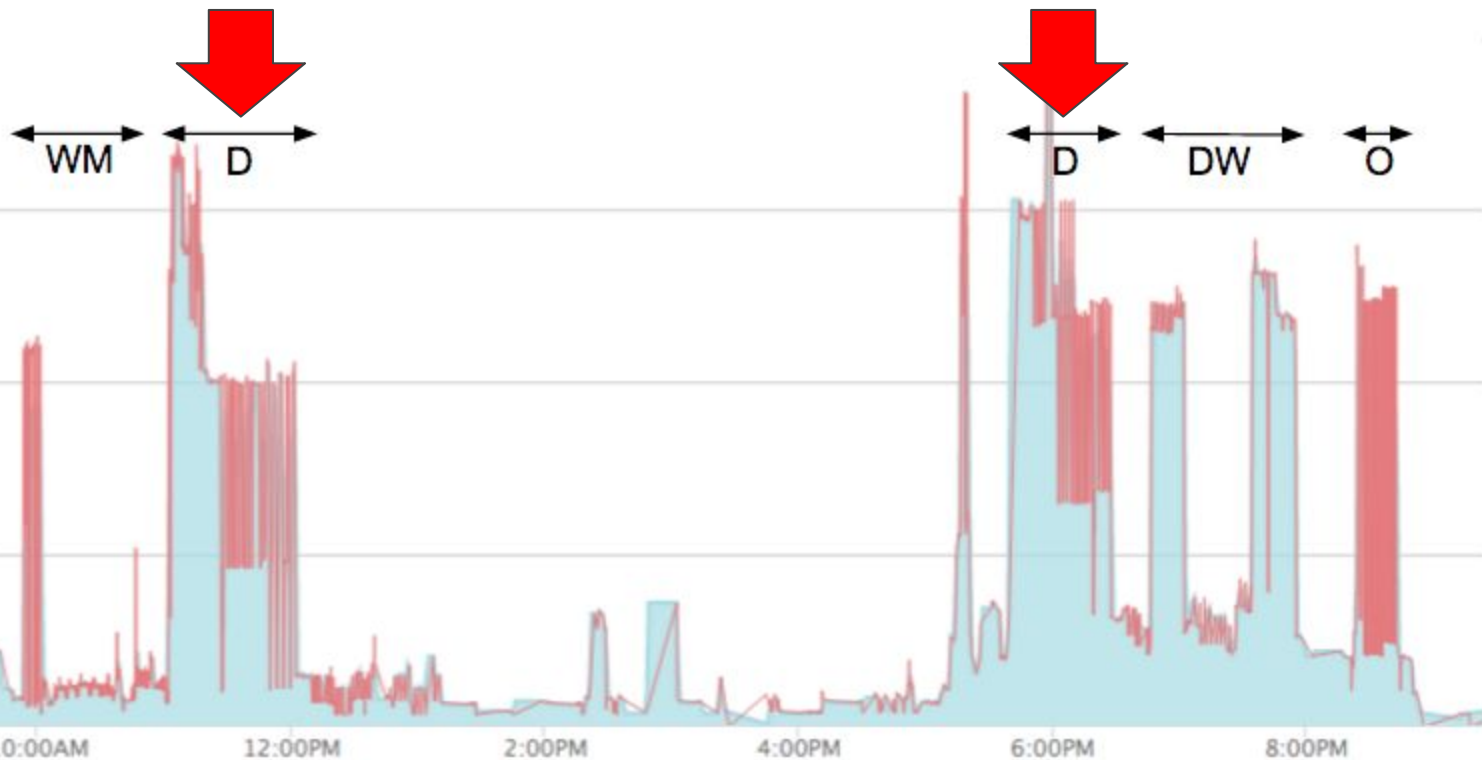
More than 90% users turn appliance off immediately after!

# Try 2: App initiated tagging

- Discover repeating patterns in data
- Send a push notification to the user
- User jogs memory and selects appliance
- After a few confirmations algorithm builds user-specific appliance model
- Positive reinforcement

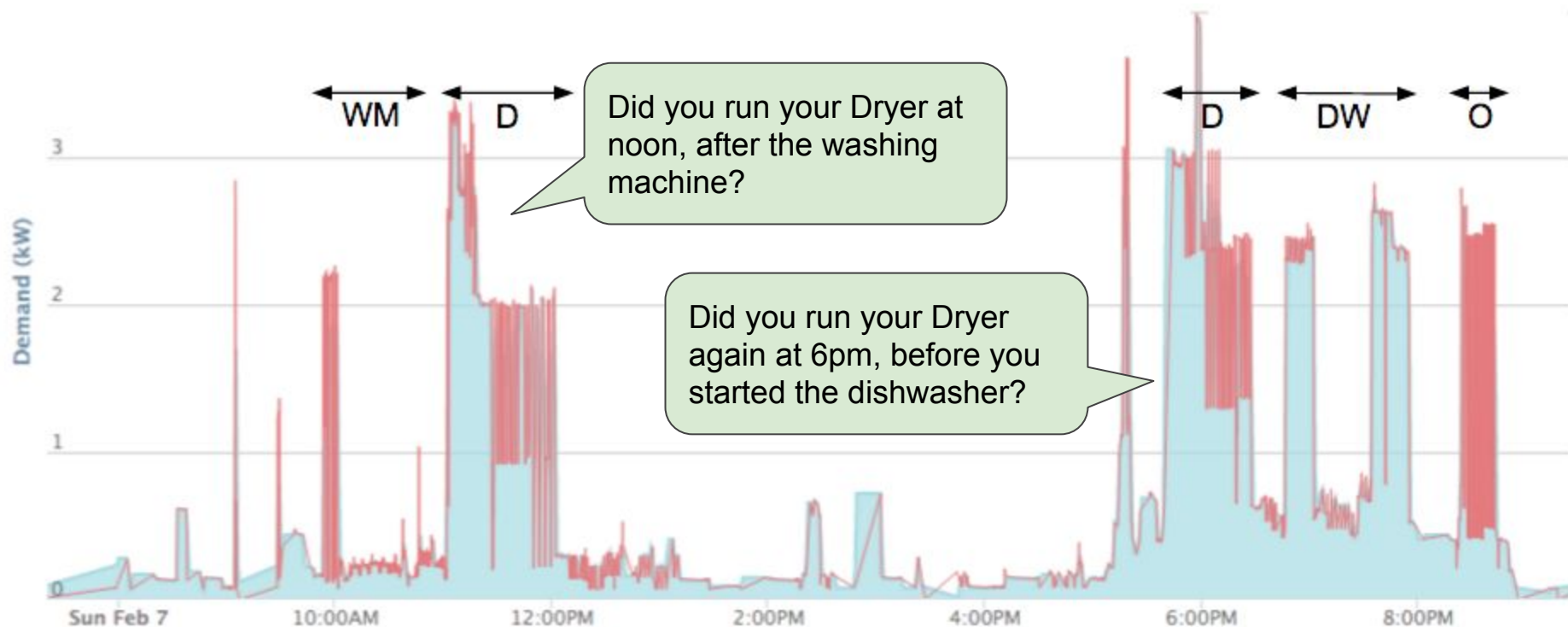


# Repeating patterns



# Push Notification

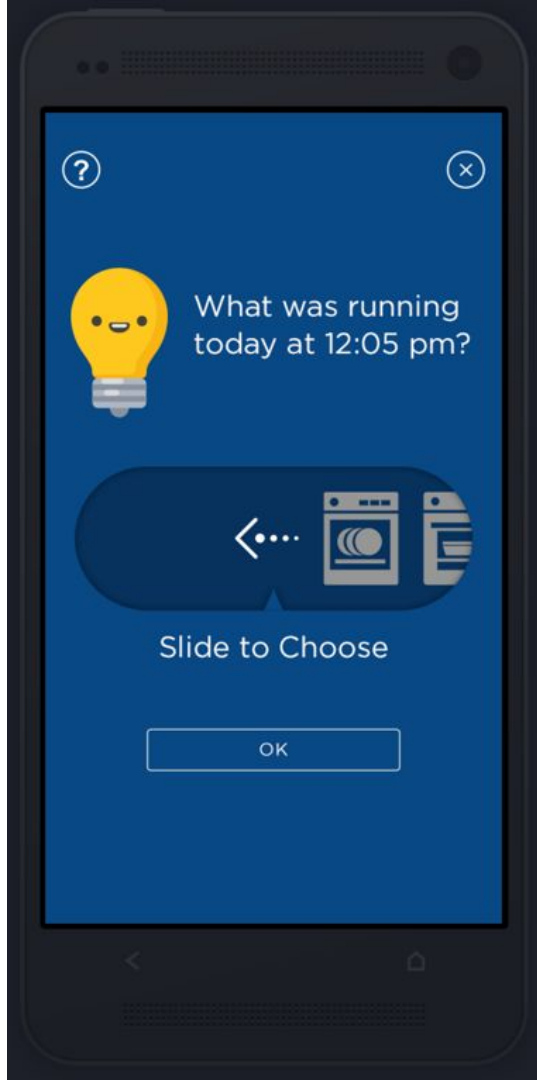
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# User tags appliance

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# Disaggregation model updated

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## Now Tracking

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### CLOTHES DRYER



We've detected your **Clothes Dryer**.

Going forward, you'll see it in your [energy usage breakdown](#), along with other appliances and devices we've already identified.

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[SEE DASHBOARD](#)

# Result

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## Quality of Inquiry generation

Recall: 0.79

Precision: 0.88



## Quality of Answers

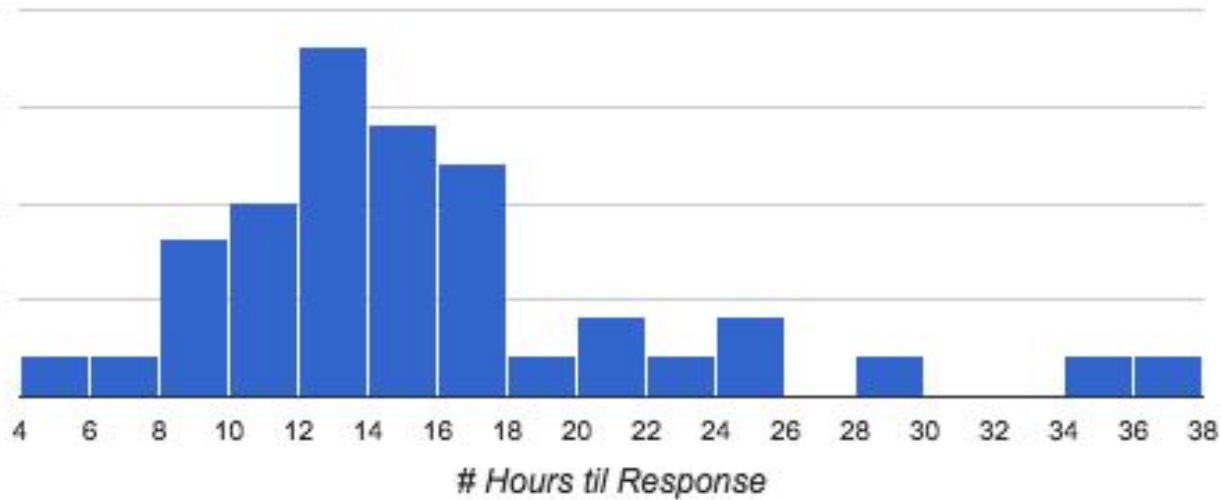
Recall: 0.93

Precision: 0.44

# Learnings: Memory fades beyond 24 hours

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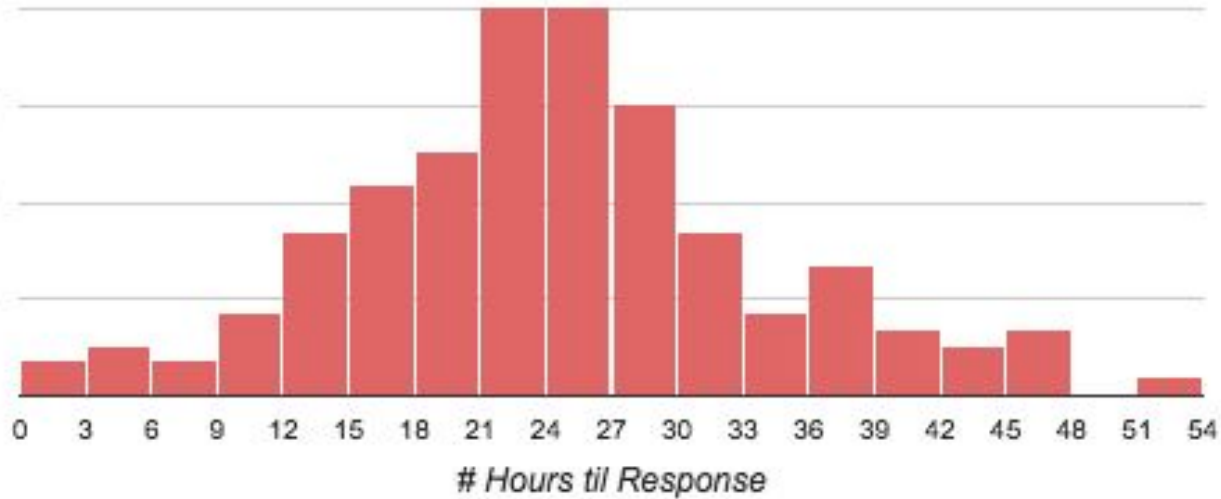
**Distribution of Gap Times (Correctly Labeled)**



# Learnings: Memory fades beyond 24 hours

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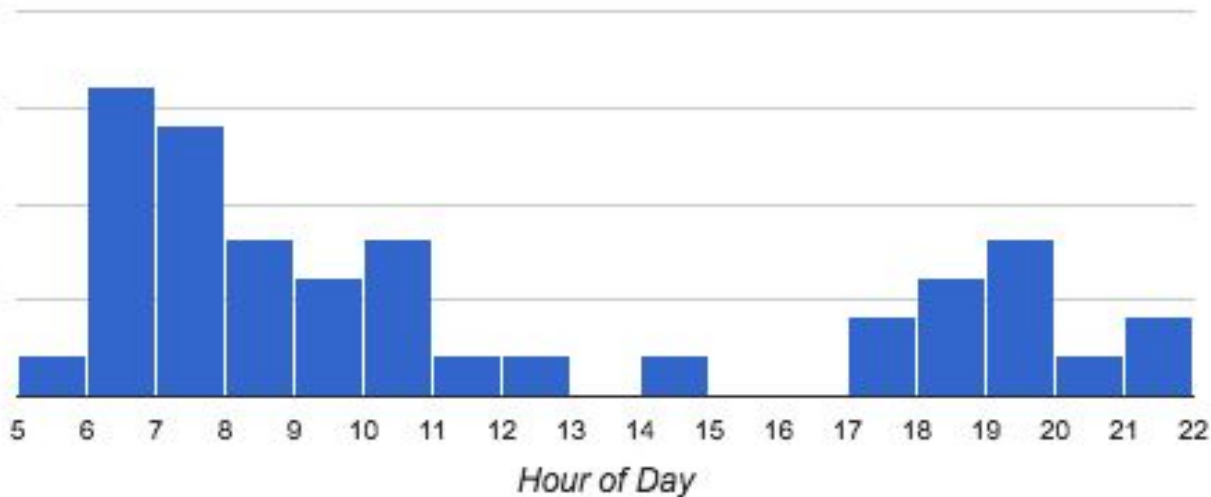
**Distribution of Gap Times (Incorrect + Useless)**



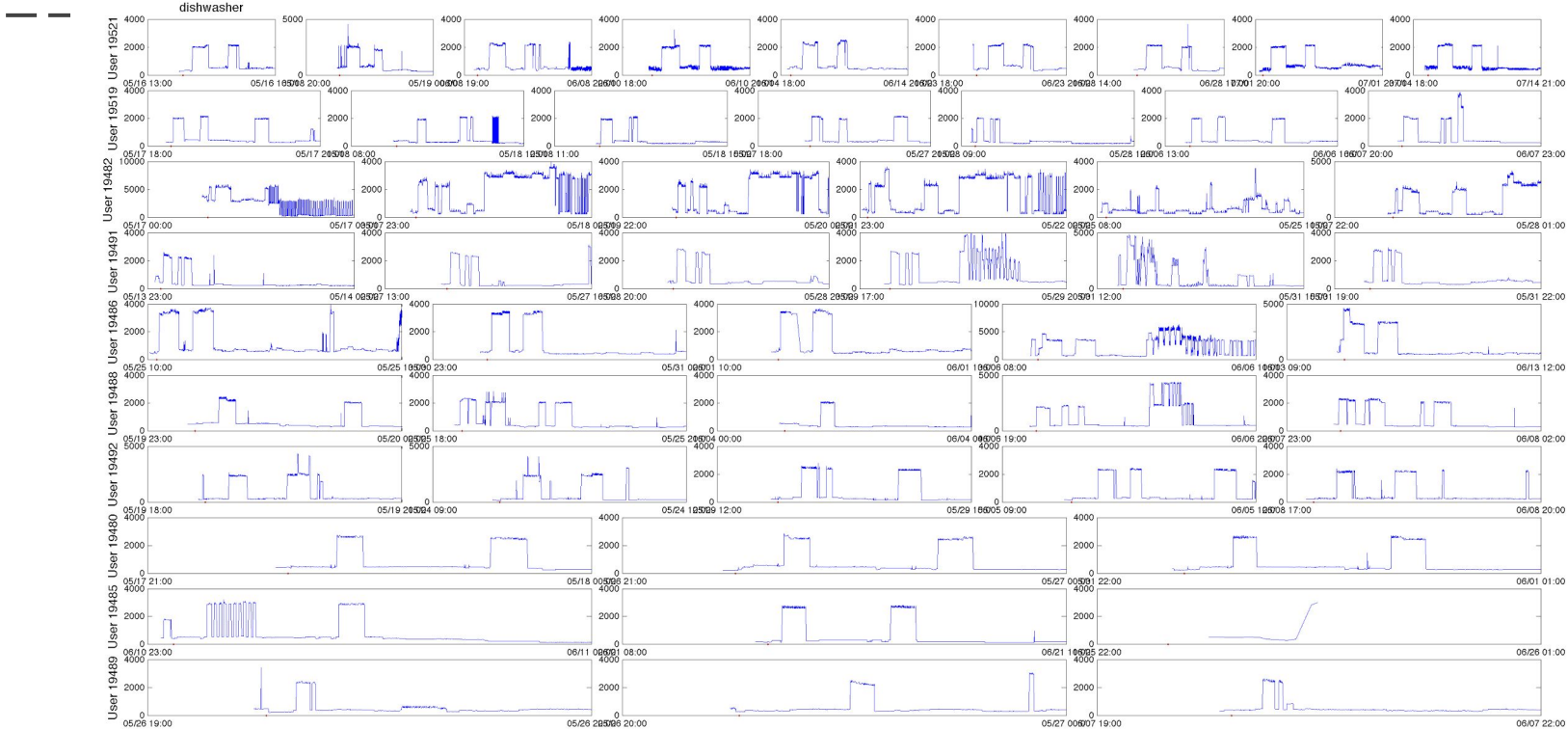
# Learnings : Morning responses are most productive

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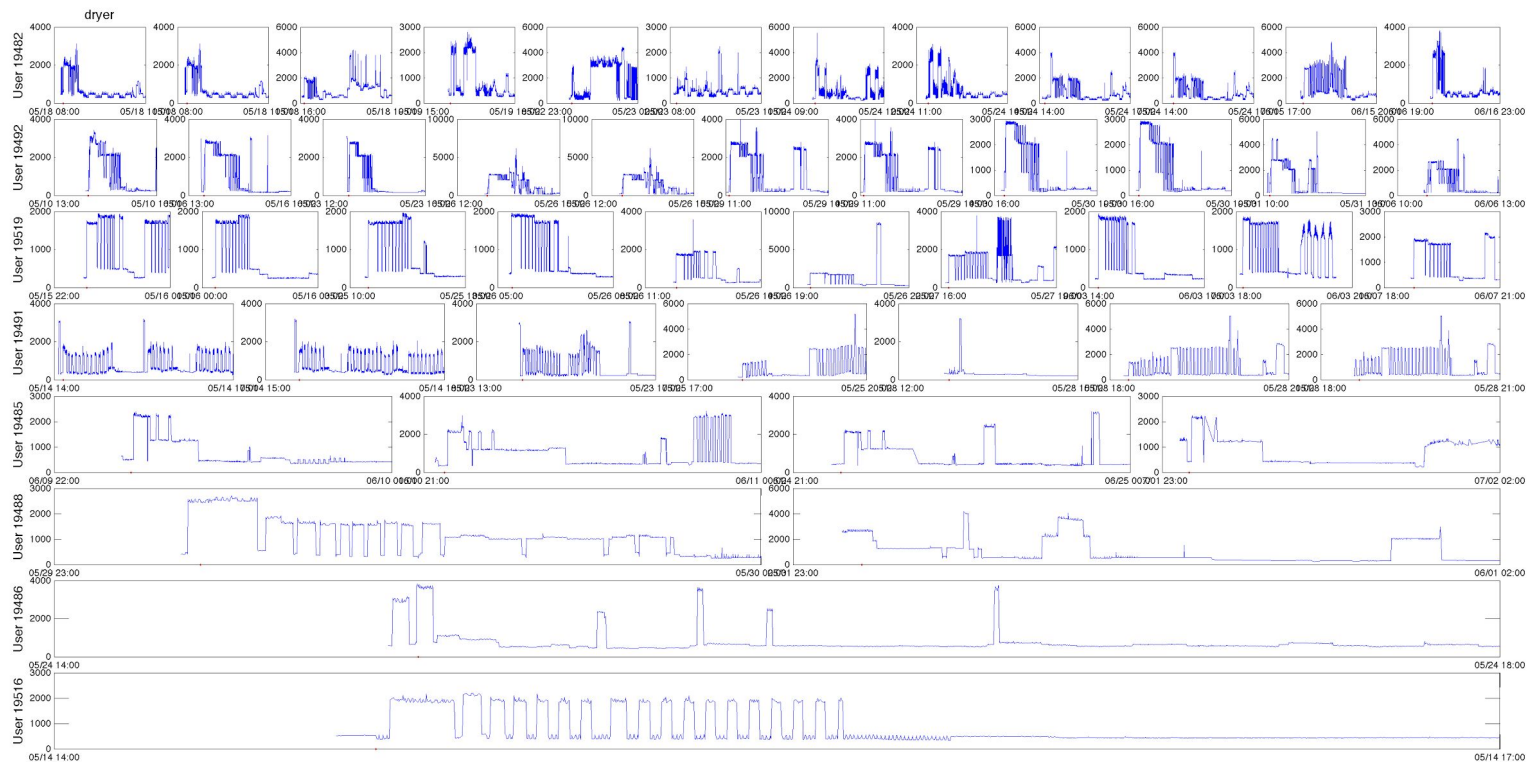
**Distribution of Response Times (Correctly Labeled)**



# Dishwashers

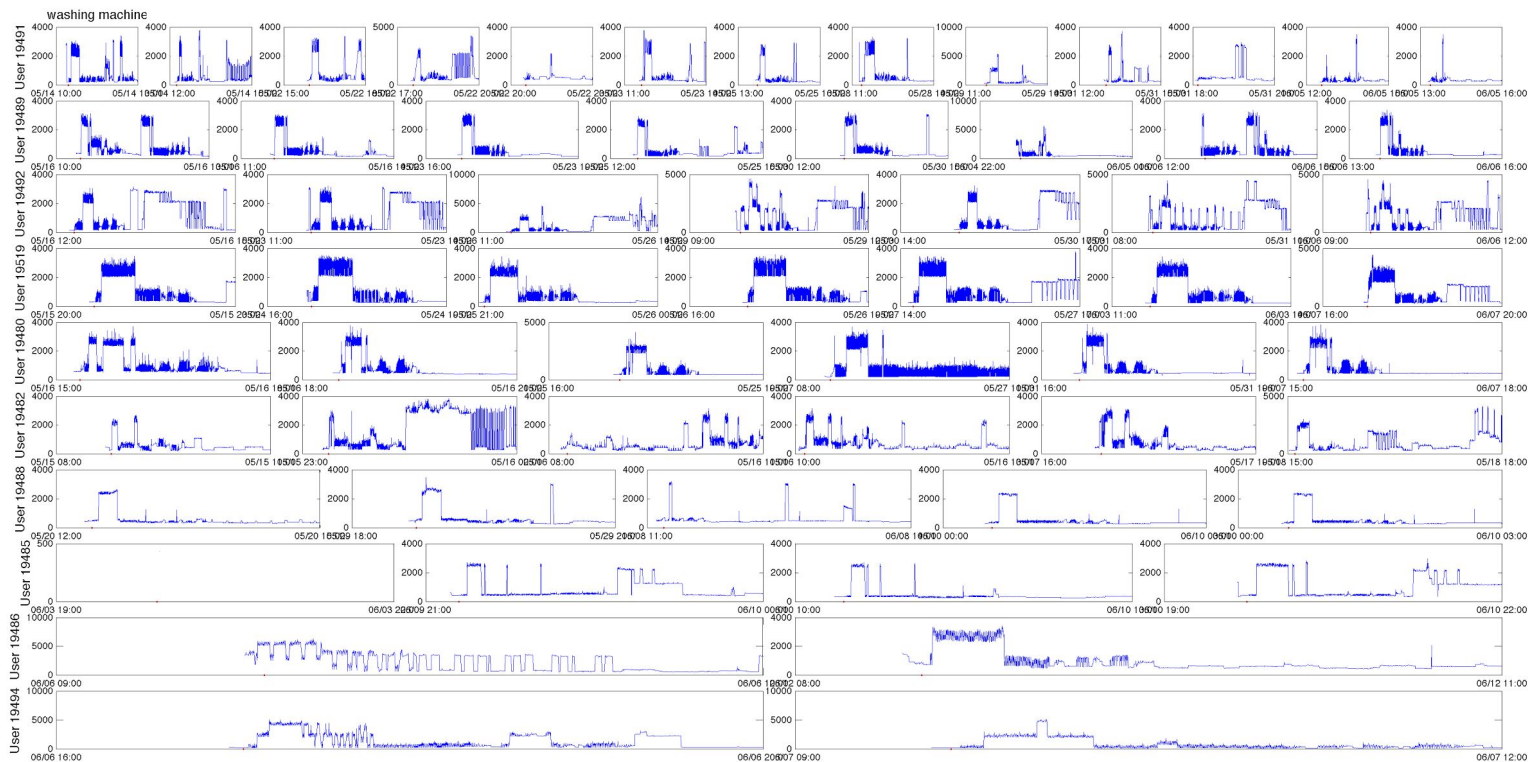


11/11/2016





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**Thank  
you!**