SmartWasher*

Adding the Smart in Washing Machine

By Christian Kjaer Laustsen // 20176018

*because everything needs a nice name

The Problem with Shared Washing Machines

- There are only a few of them compared to the amount of people
- You never know when they are in use
- It’s annoying going all the way to the washing machine and then finding out it’s occupied

The Solution?

Let people know when the washing machines are **occupied** or **free**!

SmartWasher

- SmartWasher **knows** if the machines are **in use**
- You can **check if you can do your laundry** via a website

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- Uses audio sampling to detect the state of the machine

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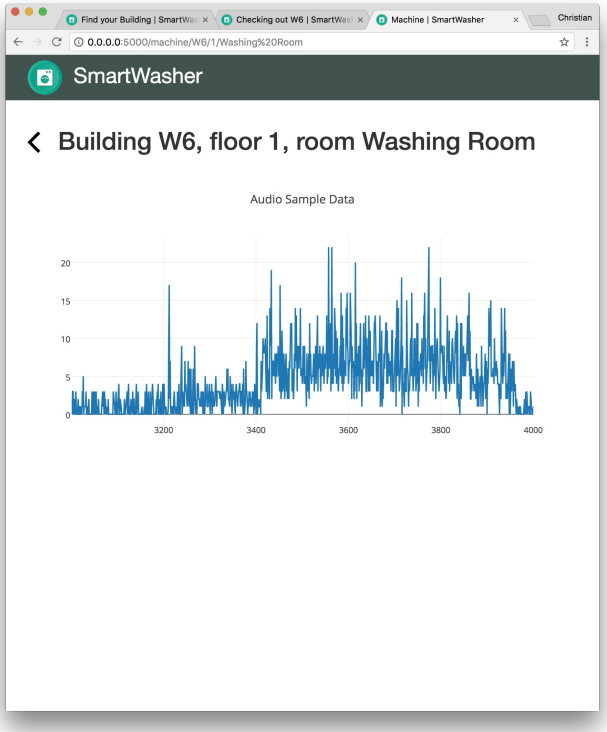
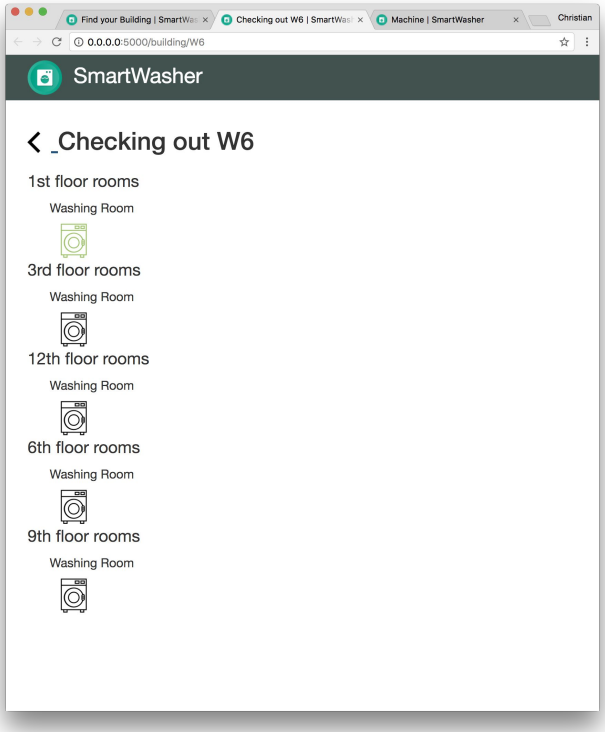


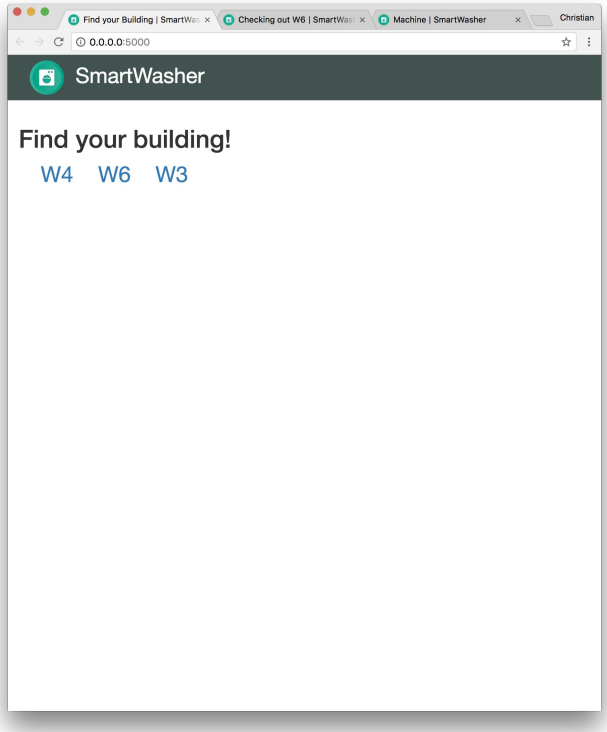
How does it work?

- Uses audio sampling to detect the state of the machine
- Sends the data to a remote server
- Predicts if it is running or not



How does it work?

- Uses audio sampling to detect the state of the machine
- Sends the data to a remote server
- Predicts if it is running or not
- Provides a UI for the user to find their machines



DEMO

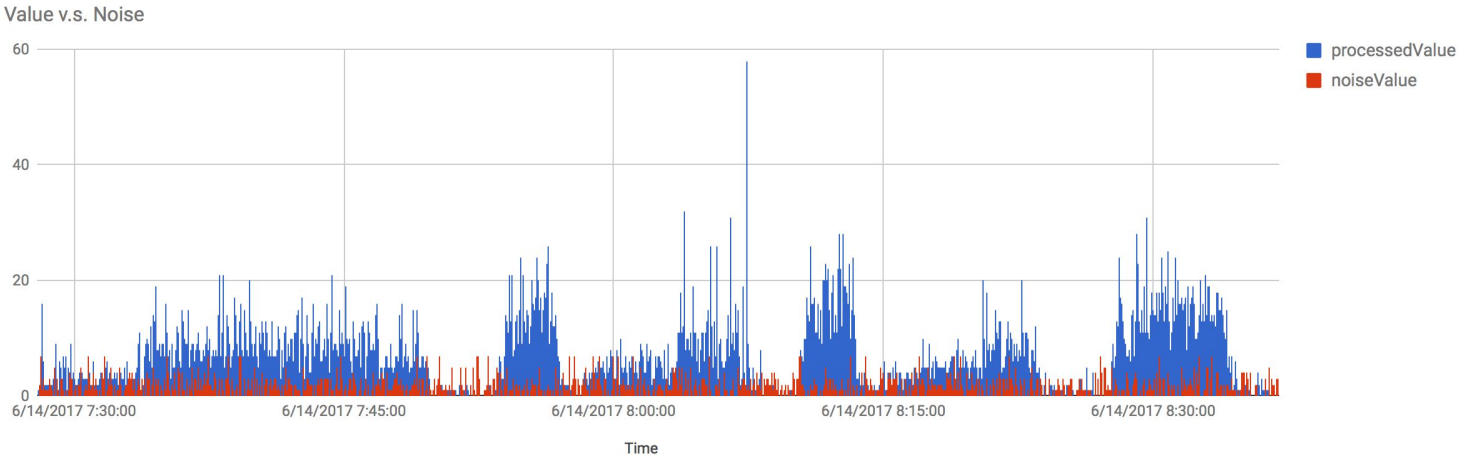
http://143.248.162.127:5000

What happens underneath?

- Uses an **Arduino Yún** and **Analog Sound Sensor** to detect sound changes and send the data to a remote server
- The remote server is a **Flask application** (Python framework) which both acts as an **API and Website**
- Uses non-linear **SVM/SVC** to create a initial model
- Runs **prediction** on request based on last **200 samples** (~5 minutes)

SVM Training

- Gathered data from washing machine running and not running
- Divided into groups of 200 samples (~5 minutes)



SVM Training

- Washing log (for later more accurate classification)

```
07:28 - Close lid
07:28 - Start wash
07:28 - Adds water
07:32 - Starts back and forth
07:49 - Stops back and forth
07:49 - Starts draining water
07:52 - completely quiet
07:53 - starts spinning
07:58 - stops spinning
07:59 - adds water
08:03 - starts back and forth
08:07 - stops back and forth
08:07 - drains water
08:09 - completely quiet
08:10 - starts spinning
08:14 - stops spinning
08:15 - adds water
08:17 - starts beeping
08:18 - adds water
```

Future Work

- Get a better sensor (or find out what I did wrong)
- Apply more specific classifications of the washing state than “Running” and “Not Running”
- Improve UI/UX on the website by providing more information
- Detecting multiple washing machines at the same time

Q & A