Presence detection

... and some cool(?) applications

Markus Storm, OpenHAB community

- Hobbyist since 2015
 OpenHAB foundation sustaining member
- Fully equipped my '80s house Lighting, shading, all HVAC, alarming, blinds, bots, family...
- Guilty of everything in the household to fail

My house & me

- Why
- Some generic thoughts
- Local sensors based
- Personalized
 - WiFi login
 - Geo tracking based
- Inhouse localization

Presence detection strategies

The Wasp In A Box Algorithm

http://dreamgreenhouse.com/projects/2013/presence/index.php#wasp

- (1) Assume there is no wasp in the box.
- (2) Have you heard the wasp buzzing in the box ?

 YES = There is a wasp in the box until you are told otherwise.
- (3) Have you opened the box since you last heard buzzing?
 YES = There is no wasp in the box.
 NO = There is still a wasp in the box if you heard one earlier.
- (4) Go to step 2.

Basic presence

- False positives
 Animals crossing, left mobile at home / in car, devices left on, ...
- False negatives
 Out of power
 Out of connectivity: outdated values
- Bad values
 Improper deployment/use/config
 peaks, misses, misreadings due to outer and inner noise
 Inappropriate detection range/resolution/sensitivity: flapping, proper thresholds

Common sensor issues

Reuse sensor items in purpose-built groups

room-Markus, Markus@home Motion detector @Markus Light switch @Markus room-Markus **Smartphone Markus** in Markus@home Foscam @garden garden, house in TV, coffee maker house in room-Markus, Markus@home in house

Combine the most reliable sensors for a detection purpose into a custom group

- Use lambdas to validate values before use val Functions \$Function1 validate [double input |]
- use a moving average on sensors (motion detectors, analog sensors) item.averageSince(now.minusMinutes(period))
- implement anti-flapping (binary) / hysteresis (numeric) sound volume, light level,...
 !item.changedSince(now.minusMinutes(period))
- use quorum to fight false positives & negatives Group: Number: SUM groupname

On sensor reliability

- Lawn mower
- Welcome lighting
- Ventilation shutoff
- Extended heating period auto party mode
- Vacuum cleaner
- Get me a coffee (please !!!)

Localized presence apps

- WiFi and BT login
 - networkhealth assign fixed IPs
 - TR069 Fritz!Box, Ubiquity Unifi, ... MAC based

Visitor tracking

- Owntracks
 - GPS & BT beacon
 - mqttitude binding

Personalized presence

Weasley clock





• Who is it?



- Garage door opener place BT beacon / smartphone in your car
- Autostart heating when leaving work

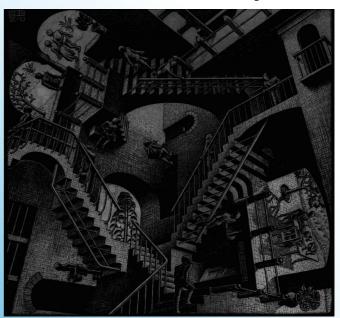
and its apps

Framework for Internal Navigation and Discovery

"FIND hypercube" in Play store

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[mqtt|https]://
ml.internalpositioning.com
```

- Find your s.o.'s mobile
- Individual lighting,
 household appliance settings,
 Music and Media



Inhouse localization