

# Presence detection

... and some cool(?) applications

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- **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Out of connectivity: outdated values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

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

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

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



# Inhouse localization