Pedge: Pit Electronics Badge

Real-life Social Data Gathering Tool as an Alternative to Sociometric Badge

Final Project of Creative Technology for Academic Year 2016-2017
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Supervised by.

- DR. E. G. Ufkes
- DR. K. P. Truong

Who am I?

Mikael Pratama

Creative/Smart Technology
Mathematics Philosophy Decent
Programmer Linux Project

I can make electronics as well!

Things I like:

- Programming
- Reading
- My Nintendo 3DS

Things I hate:

- **CSS and JavaScript**

Contacts me at:

- **Twitter**: @notalentgeek
- **GitHub**: /notalentgeek

It's my highschool hacker name please don't comment :D

Do first think later...

Setup the whole Pedge web environment (database server and web server)

- *adduser pedge*
- *usermod -aG sudo pedge*
- *su - pedge*
- *cd ~ && git clone https://github.com/notalentgeek/pedge --depth 1*
- *cd ~/pedge/script/ubuntu_1604_server/*
- *chmod +x ./setup.sh*
- *sudo ./setup.sh*

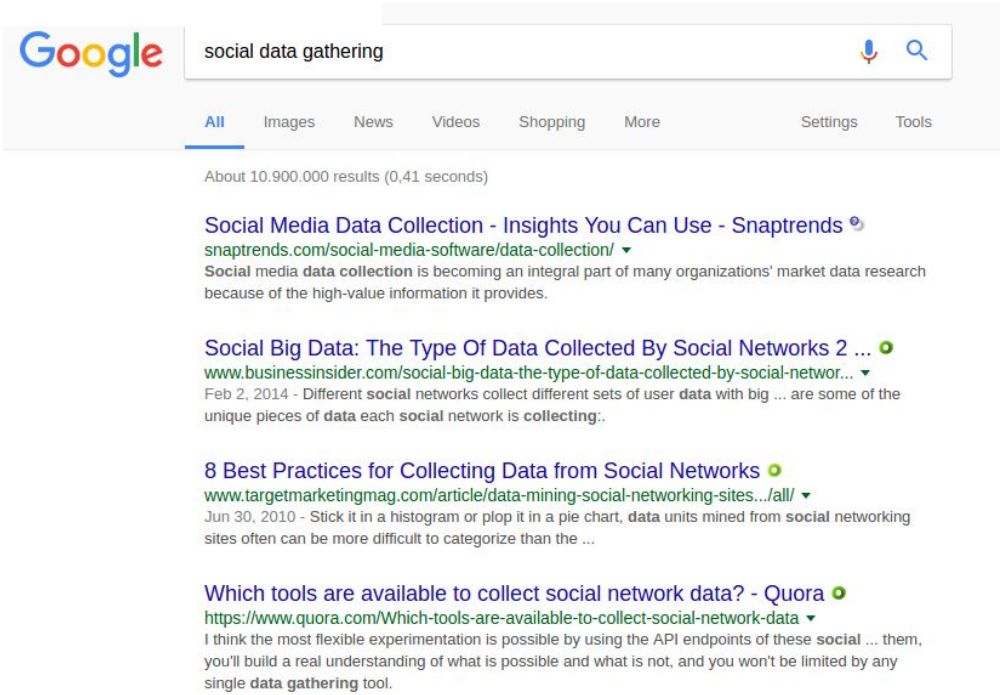
Setup Pedge Raspberry PI client

- *cd /home/pi*
- *git clone https://github.com/notalentgeek/pedge --depth 1*
- *cd /home/pi/pedge/script/raspbian_jessie/*
- *chmod +x ./setup.sh*
- *sudo ./setup.sh*

About this project...

- ➔ **What:** Creating a real-life social data gathering device
- ➔ **Who:** Sociometric Badge and Rhythm Open Badge
- ➔ **Who:** Social Scientists and Makers
- ➔ **Why:** Closed, hard to buy, and custom hardware
- ➔ **How:** Leveraging popular development tools!

Google is a troll :(



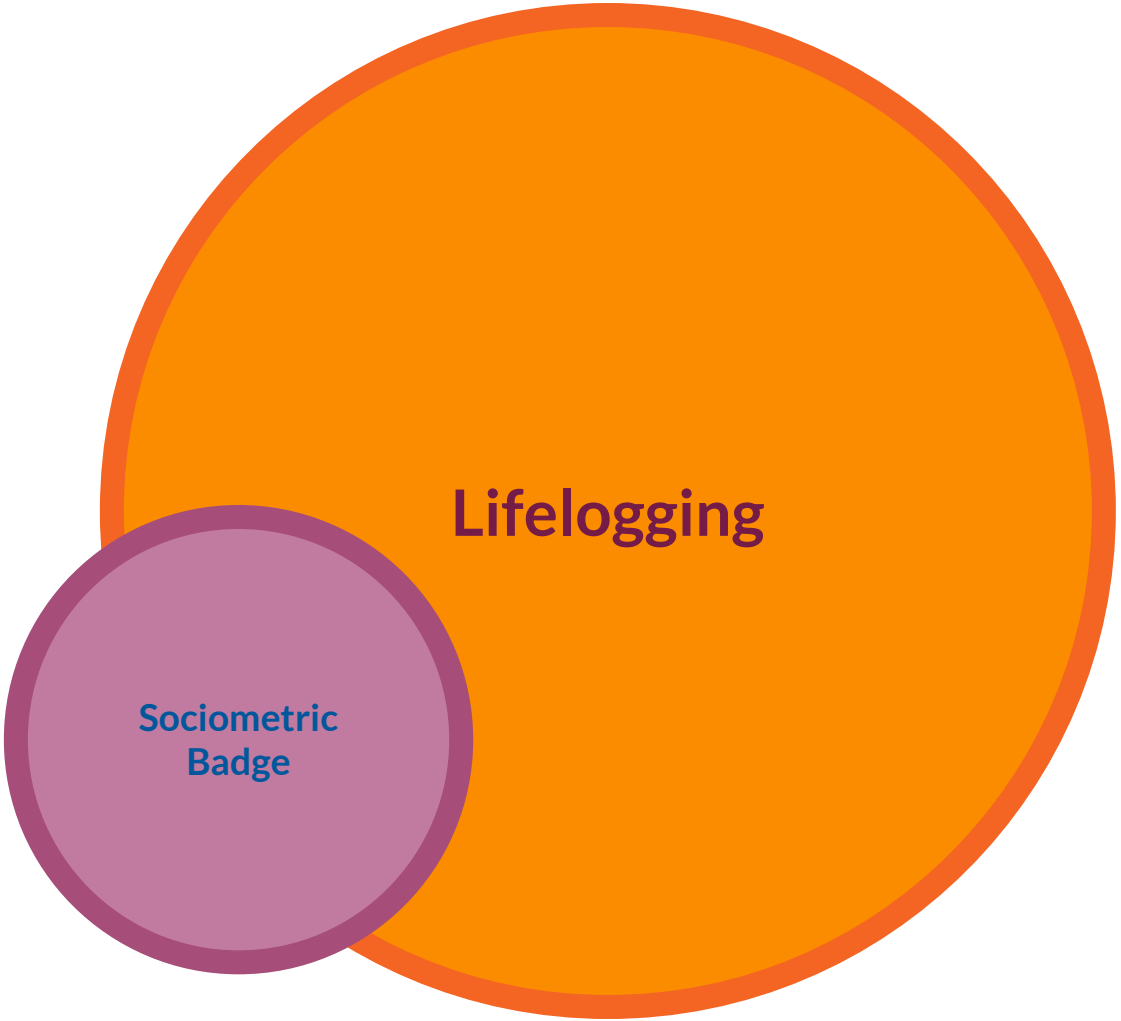
Problem: The term is misleading

Solutions:

- “Social observation”
- “Real-life social data gathering”

Project Scope

- General lifelogging
  - Human blackbox
- Sociometric Badge: Corporate-grouped community logging
- Emerging in research
- No successful consumer product just yet :(



History of Sociometric Badge:

1992 Active Badge

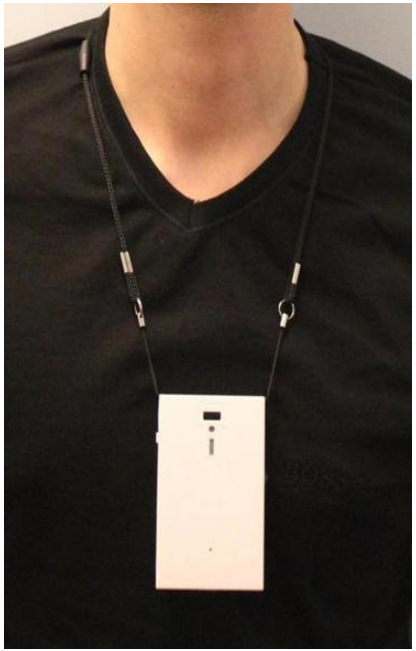
1998 Meme/Thinking Tag

2003 Sociometer and UbER Badge

2008 Sociometric Badge

2016 Rhythm Open Badge

What is it?



- Emerging device in real-life big data
- Takes social signals
- Some machine learning magic

How does it feels to be judged by a machine?

- *Adjust workspace position*
- *Knowledge flows*

—

Problem with Sociometric Badge

- @ Buy on request
- $ Expensive
- *Manual data extraction*
- Not transparent

Then... Rhythm Open Badge

- Prosss :D
  - Open source!
  - Extremely low powered (one coin battery)
- Neutral :|
  - Still in development (21 January 2016)
- Cons :(((
  - Custom hardware...
  - Unpopular electronics board!

http://www.rhythm.mit.edu/

Project's Principles

Less electronics

More programming

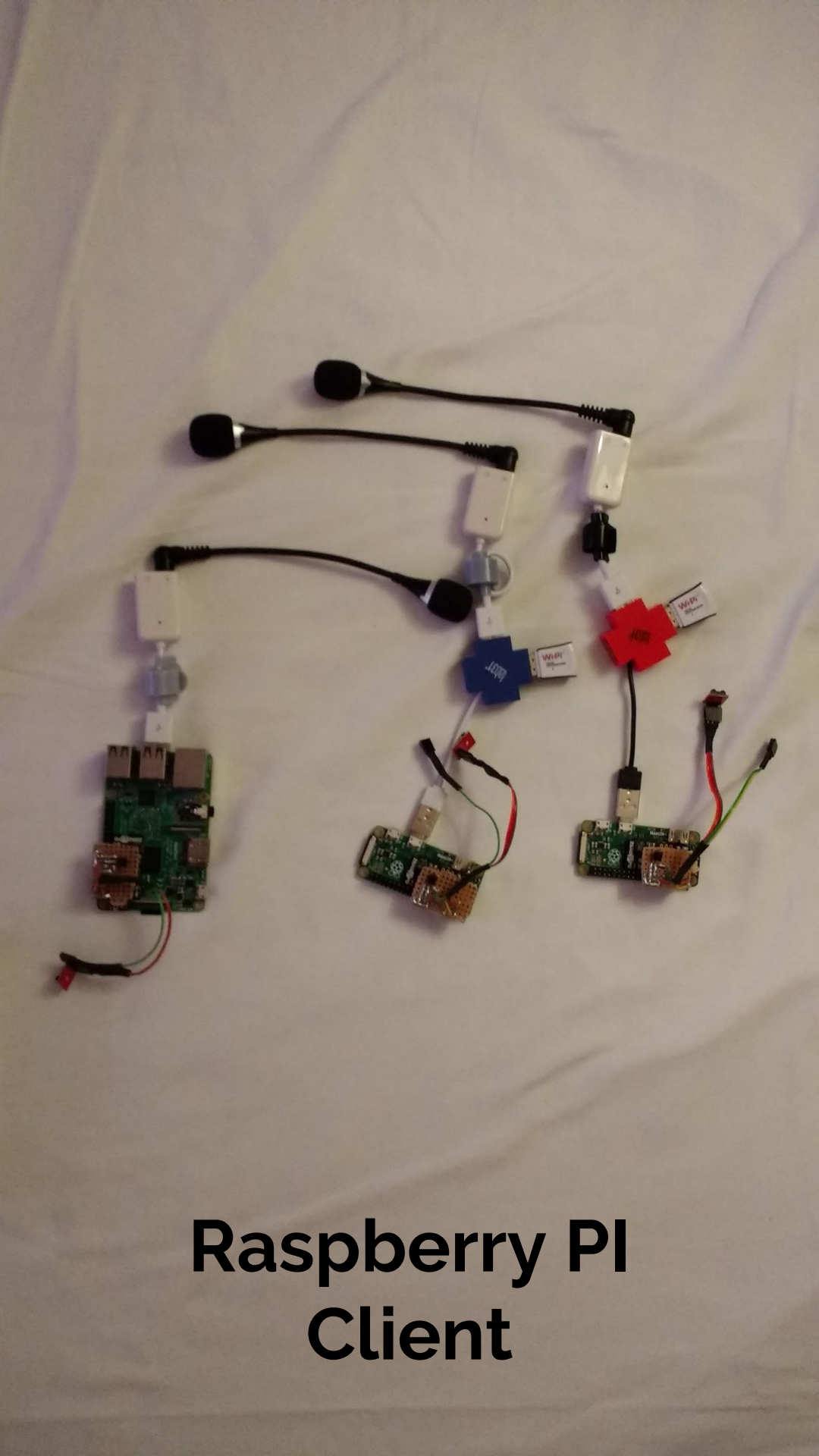
Easy to install/setup

Easy to use

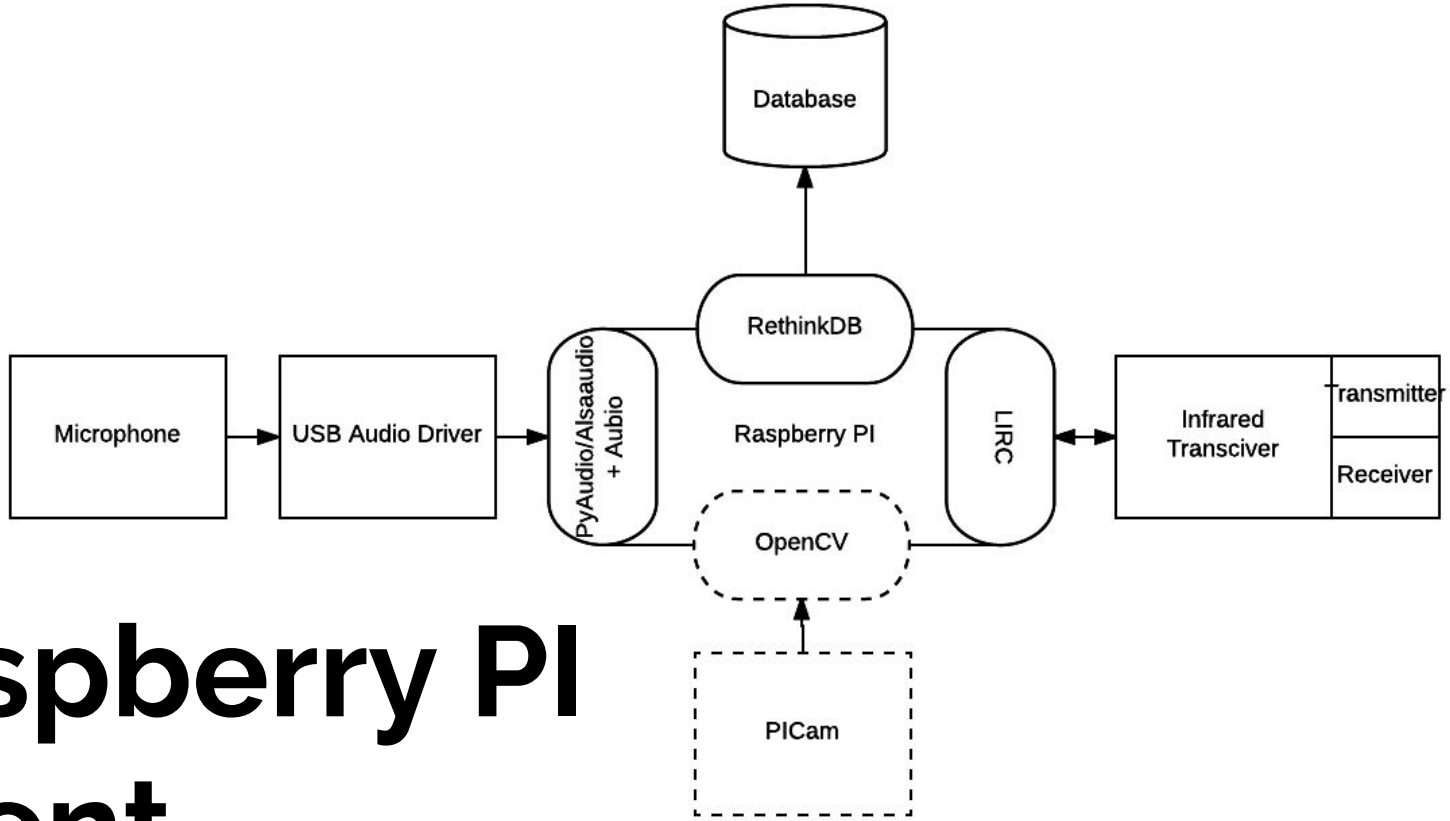
Use popular development platform

- Hardware
- Software

Pedge
Pit
Electronics
Badge



Raspberry PI Client



Raspberry PI Client

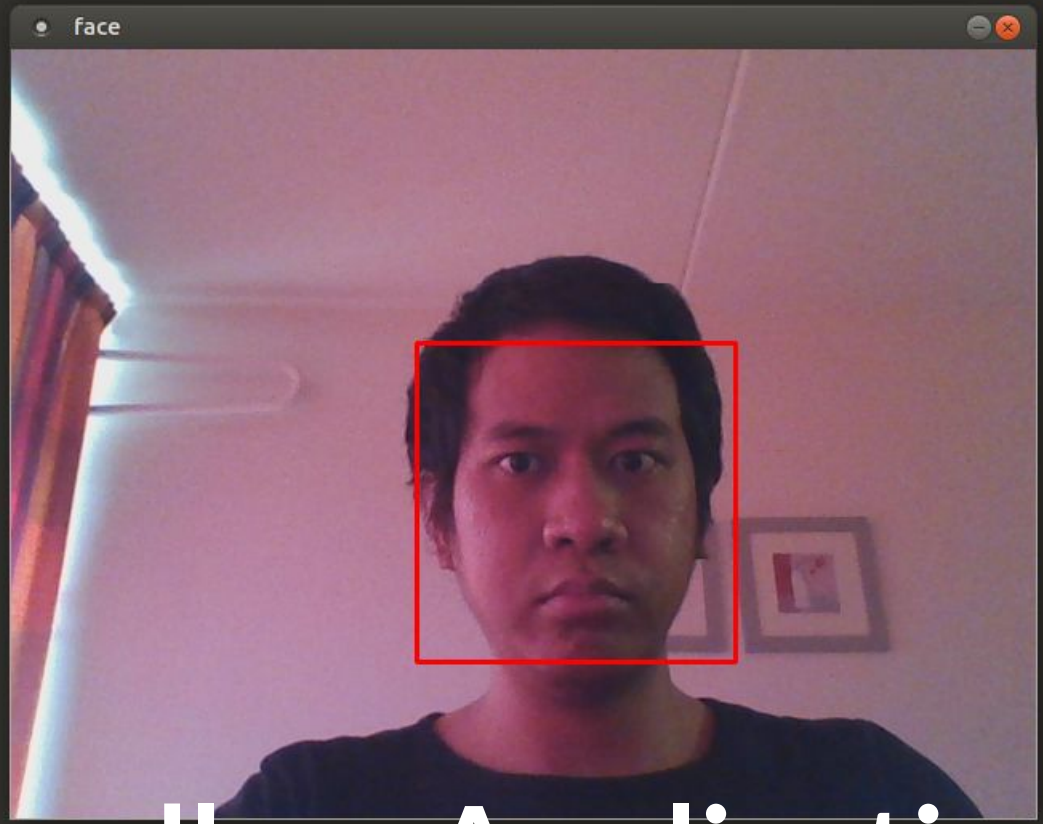
Applications Places System

Terminal

File Edit View Search Terminal Help

```
name_client             : asd
name_db                 : server_pedge
port_db                 : 28015
no_db                   : False
no_face                 : False
no_pitch                : False
no_presence             : True
no_volume               : False
no_print_log            : False
use_gui_opencv          : True
use_rpi                 : False
use_rpi_cam             : F=====================
============================rlin-face-1
asd-20170519130307-europe/berlin-pitch-0.0
asd-20170519130308-europe/berlin-volume-0.000006
asd-20170519130308-europe/berlin-face-1
asd-20170519130309-europe/berlin-pitch-0.0
asd-20170519130309-europe/berlin-volume-0.000007
asd-20170519130309-europe/berlin-face-1
asd-20170519130310-europe/berlin-pitch-0.0
asd-20170519130310-europe/berlin-volume-0.000006
asd-20170519130310-europe/berlin-face-1
asd-20170519130311-europe/berlin-pitch-0.0
asd-20170519130311-europe/berlin-volume-0.000044
asd-20170519130311-europe/berlin-face-1
asd-20170519130312-europe/berlin-pitch-0.0
asd-20170519130312-europe/berlin-volume-0.000004
asd-20170519130312-europe/berlin-face-1
asd-20170519130313-europe/berlin-pitch-0.0
asd-20170519130313-europe/berlin-volume-0.000002
asd-20170519130313-europe/berlin-face-1
asd-20170519130314-europe/berlin-pitch-0.0
asd-20170519130314-europe/berlin-volume-0.000029
asd-20170519130314-europe/berlin-face-1
asd-20170519130315-europe/berlin-pitch-0.0
```

face



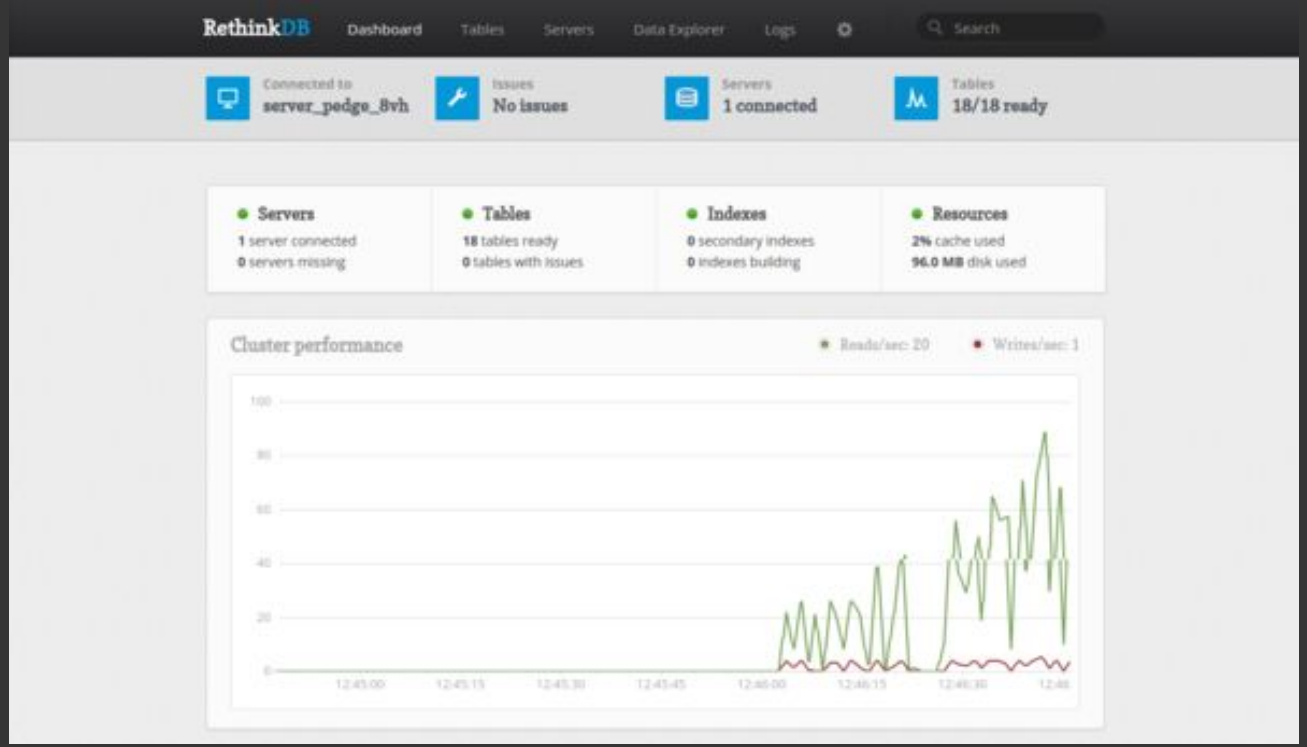
Headless Application

EASY SETUP WITH CLI WIZARD

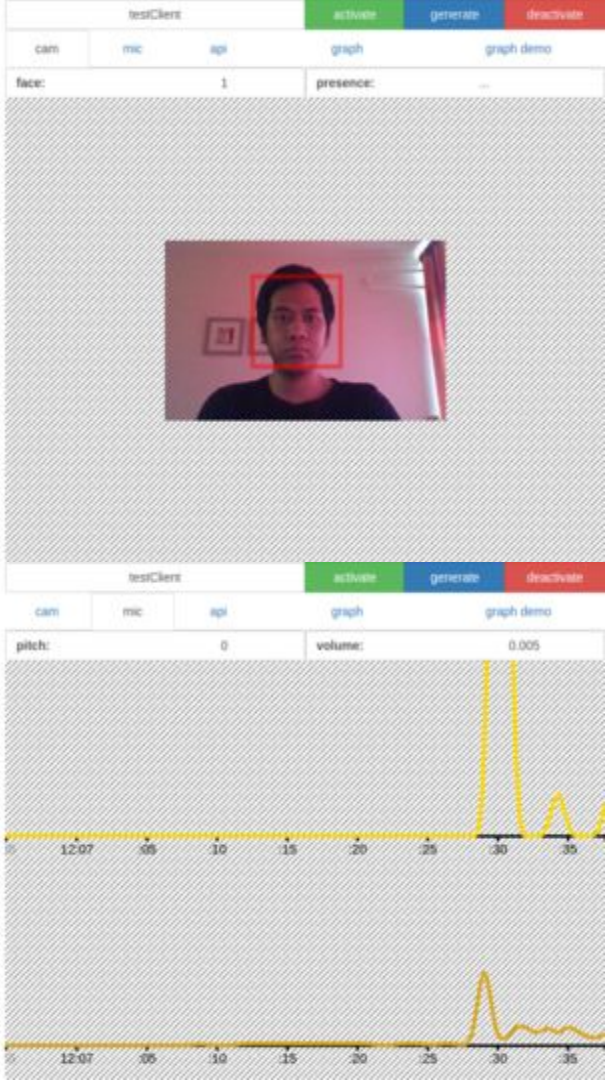
```
please input          : client name
requirement           : alpha-numeric, camelCase, case sensitive, no space
example               : richardDawkins
default               : do not fill and just press enter to fill the default value of "testClient"
client name           : mikael

please input          : database IP ad
requirement           : alpha-numeric, not cas ens tive, o pace
example               : 127.0.0.1 or h p://1 0.1
default               : do not fill an just res ter to ll the de u value of "1 0.
database address      :

please input          : database name
requirement           : alpha-numeric, lower case, underscore_case, no sp ce
example               : my_database
default               : do not fill and just press enter to fill the defau e o "se ver_ edge
database name         :

please input          : database port
requirement           : numeric, no space
example               : 28015
default               : do not fill and ust pr s ent r to ill th d ault valu f "
database port         :

please input          : lirc registered ir code
requirement           : alpha-numeric, underscore_case, upper_case, no space
example               : KEY_1
default               : do not fill and just press enter to fill the default value of "KEY_1"
key ir                :
```

sudo python3 -B pedge.py start-wizard

RethinkDB Database Server



http://<ip_address>:8080



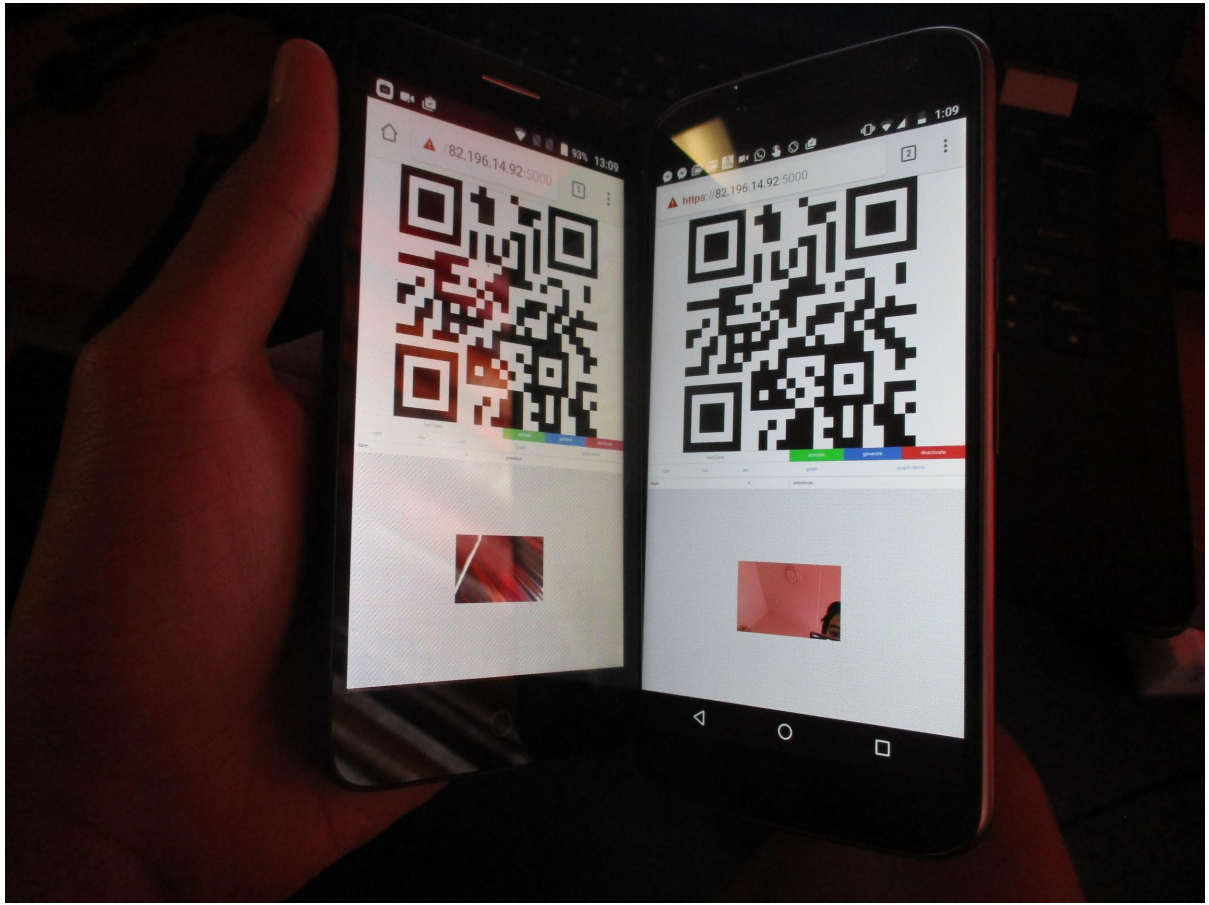
Web Application Client:

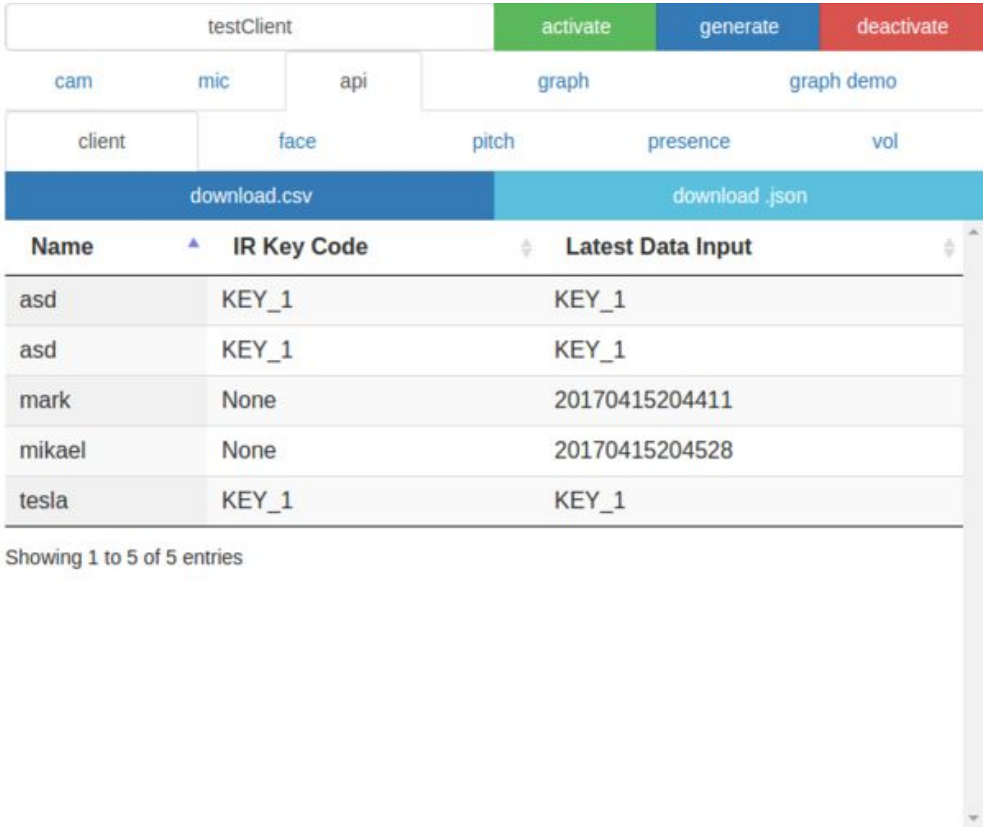
- **Face detection**
- **Presence detection via QR detection**
- **Pitch and volume detection**

https://<ip_address>:5000

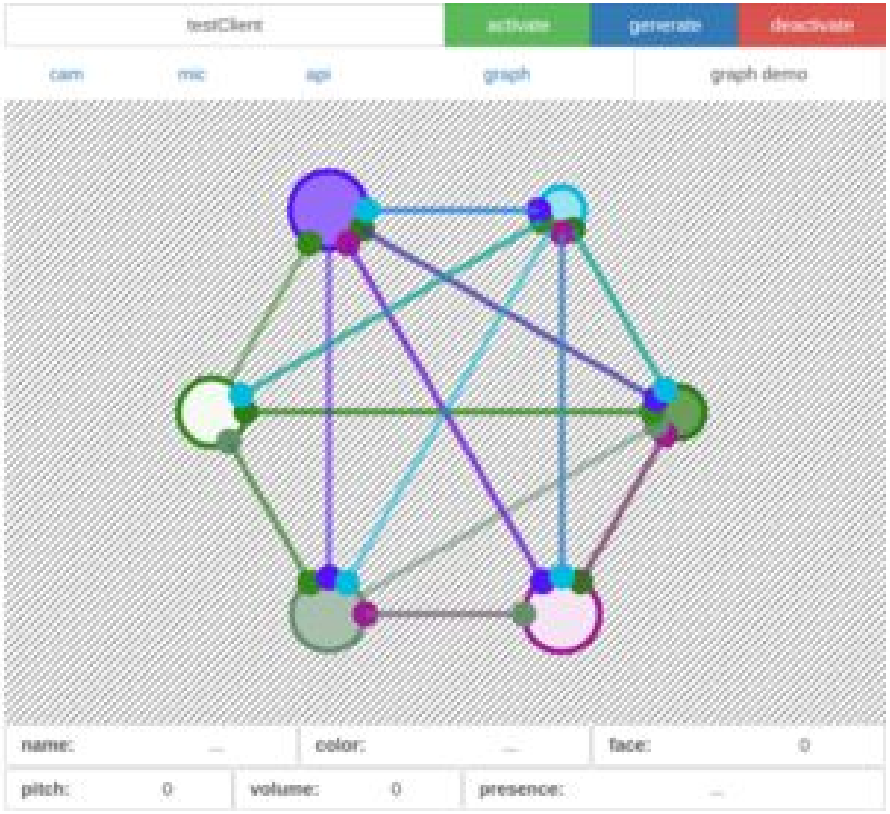
QR code presence detection

- Intended for face-to-face detection
- Going back to Meme Tag
- Not so accurate (sadly)
- There is no need for multiple QR codes detection just yet

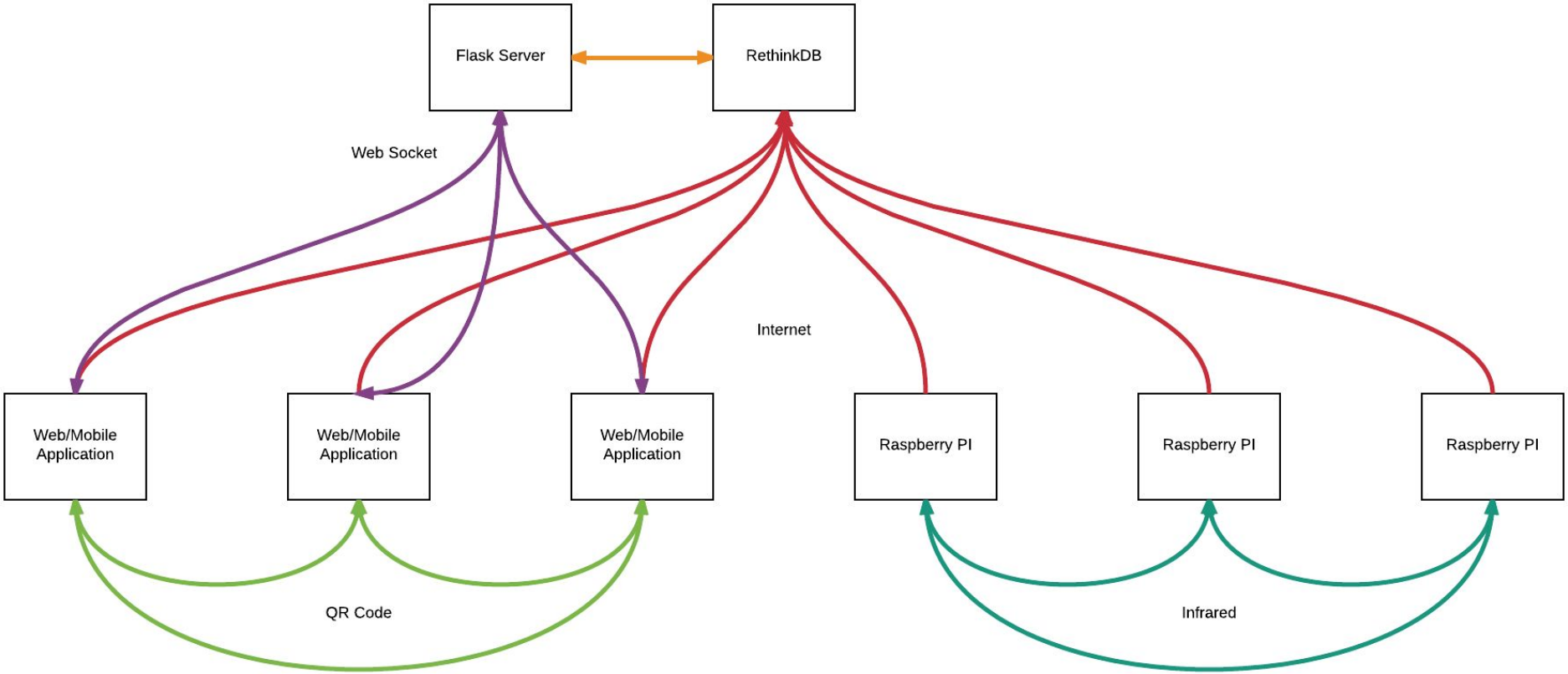




Database interface + download database table as .csv!



Moreno’s Sociogram-like


Flask Server
RethinkDB
Web Socket
Internet
Web/Mobile Application
Web/Mobile Application
Web/Mobile Application
Raspberry PI
Raspberry PI
Raspberry PI
QR Code
Infrared

Automatic Installations

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Manual Installations

- Why manual installation? Self-troubleshooting
- Two manual installation instructions
  - Command-level
  - Software-level
- Command level instruction example

sudo /bin/sh -c 'printf "\npcm.!default{\n type hw card 1\n}\nctl.!default{\n type hw card 1\n}" > /home/pi/.asoundrc'

Manual Installations

- **Software level instruction**
  - **In terminal run** *sudo nano /home/pi/.asoundrc*.
  - **Add these lines.**

```
pcm.!default{
    type hw card 1
}
Ctl.!default{
    type hw card 1
}
```

—

Conclusions:

- Social device needs **context flagging agent**! Numbers alone does not matter!
- Leverage **multi-modal sensors**…. Detection in software level!
- The most convenient installation method is **automatic installation**
- Software-level instruction is the best way to teach self-troubleshooting
- Command-level instruction is prone to copy-paste error