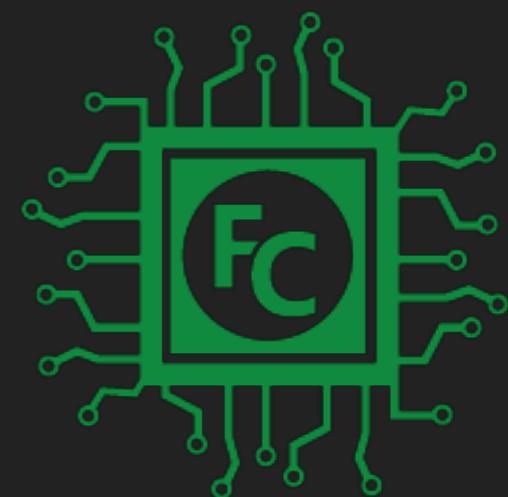




SMART-HOME FOR BEGINNERS

GLADOS



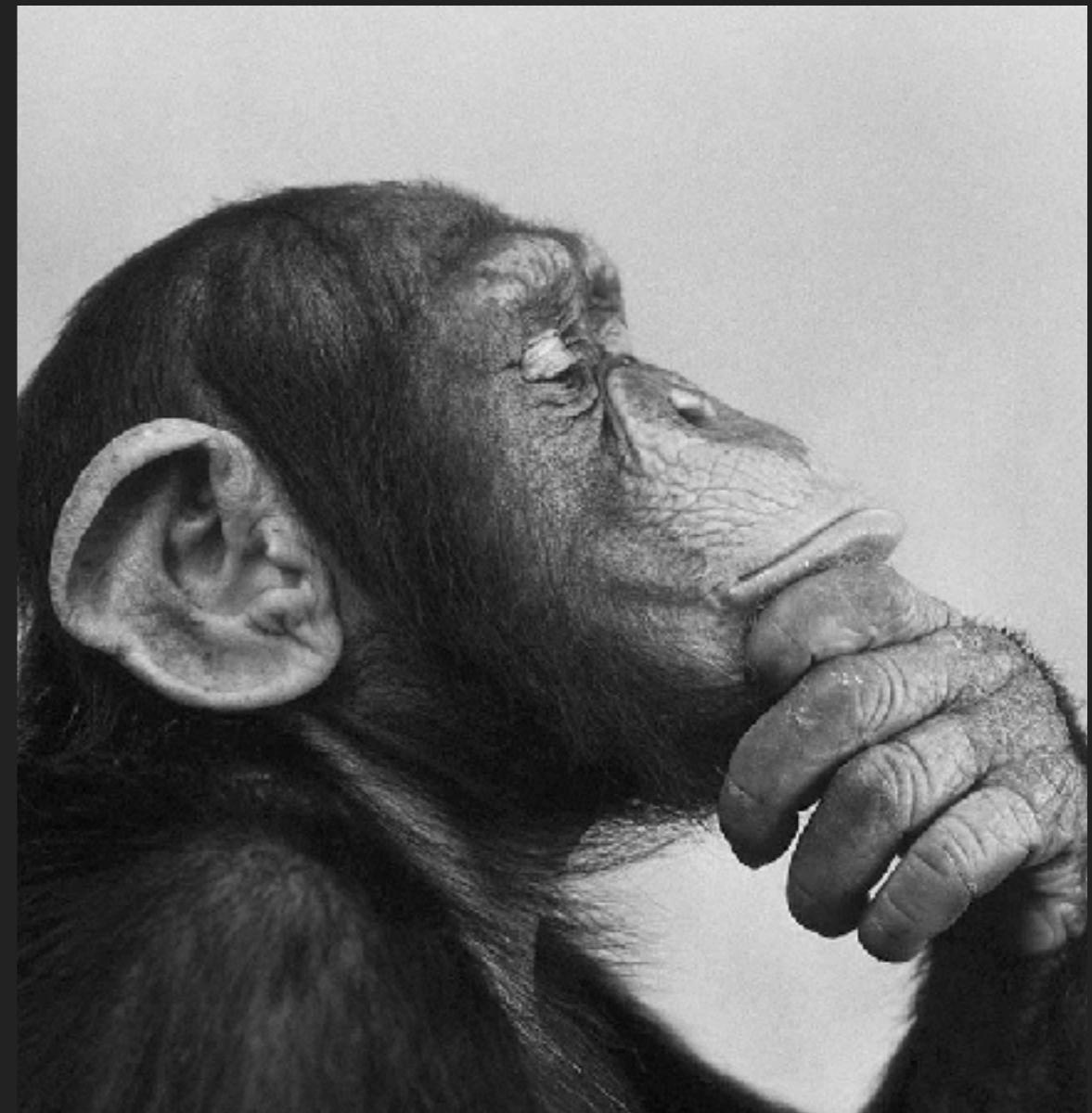
#THROWBACK

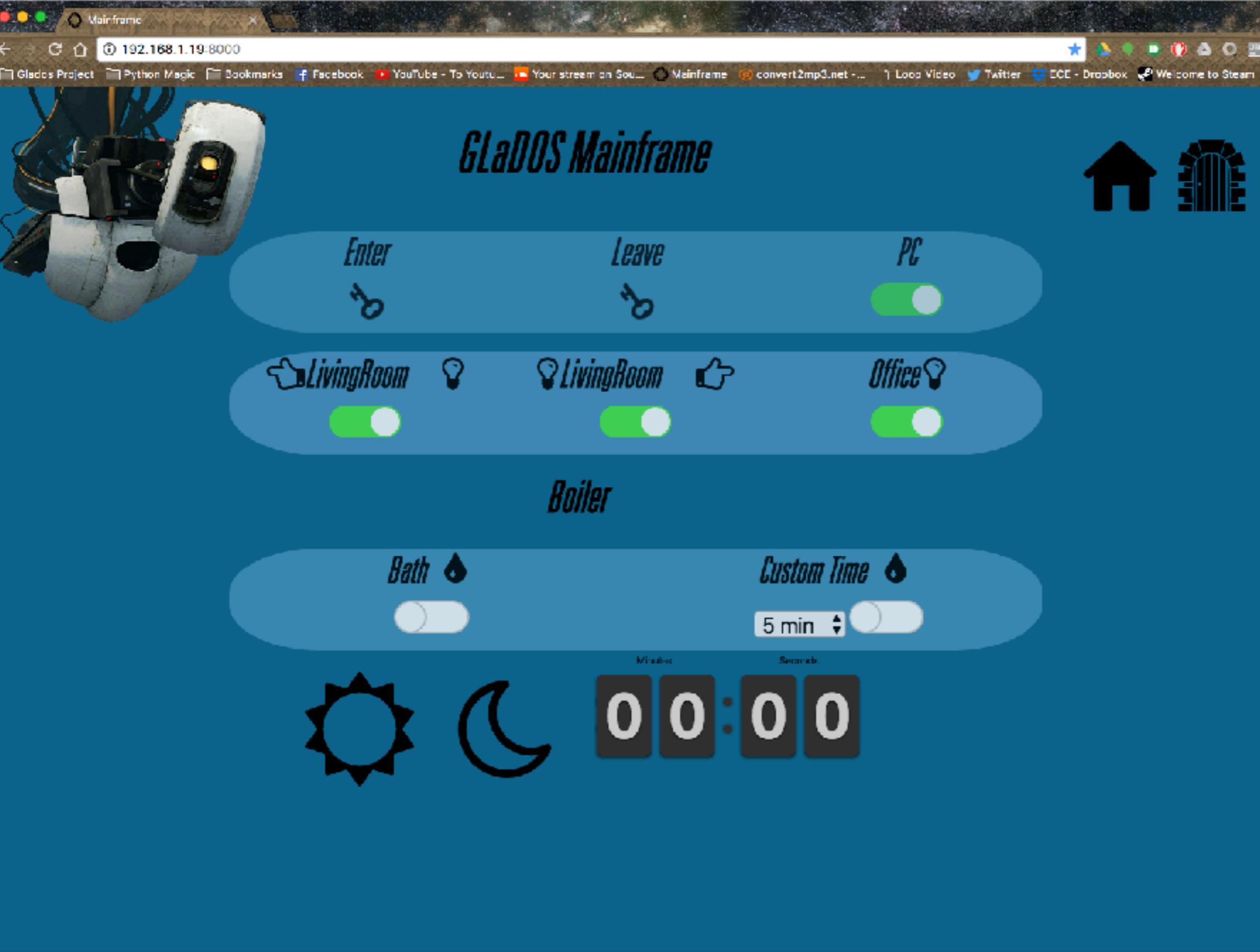
- ▶ Electrical Engineering student
- ▶ “Hello World” programming knowledge
- ▶ Forgetful
- ▶ lazy
- ▶ Curious
- ▶ First contact with electronics and embedded programming



PROBLEMS

- ▶ Constantly losing the apartment's keys
- ▶ Forget to turn of Boiler
- ▶ Forget to turn of the lights
- ▶ Automatic music playback would be way too cool
- ▶ No programming knowledge or portfolio

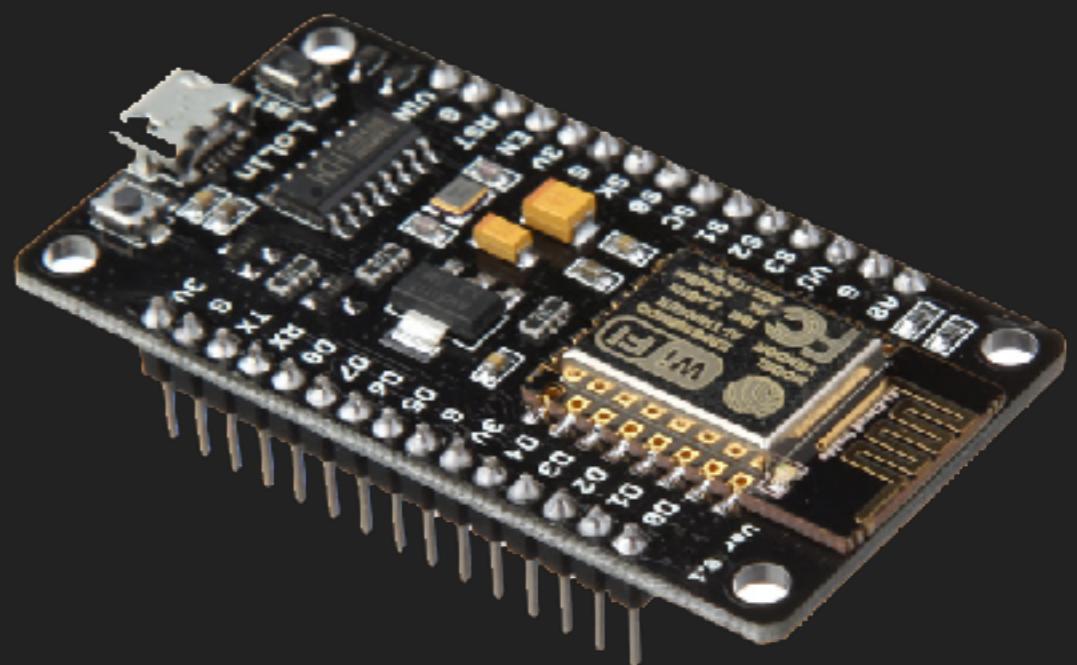




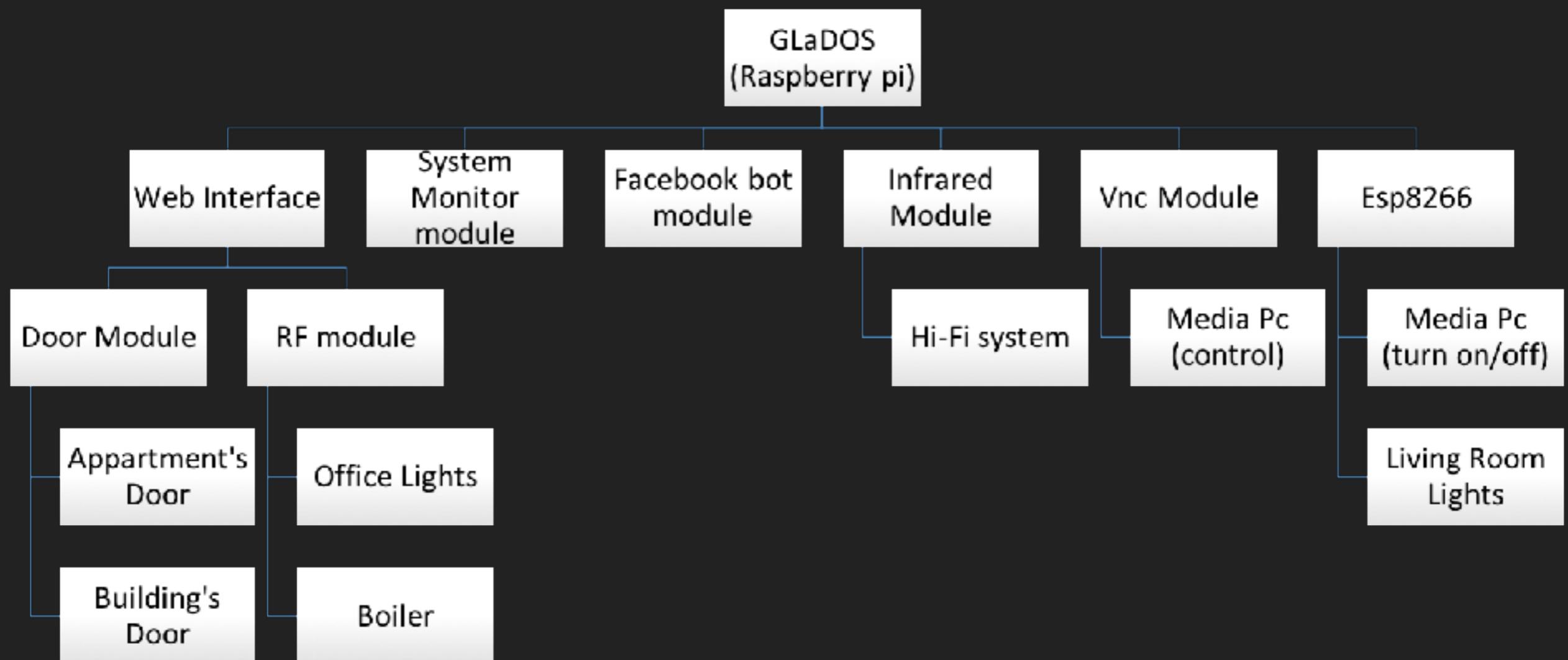
A COMPLETELY CUSTOM IOT SOLUTION

SOLUTION

- ▶ Based on Raspberry pi & Esp8266
- ▶ Simple web interface & facebook bot control
- ▶ Core platform uses python, thus infinite possibilities
- ▶ Modularity simplifies upgrading and iteration

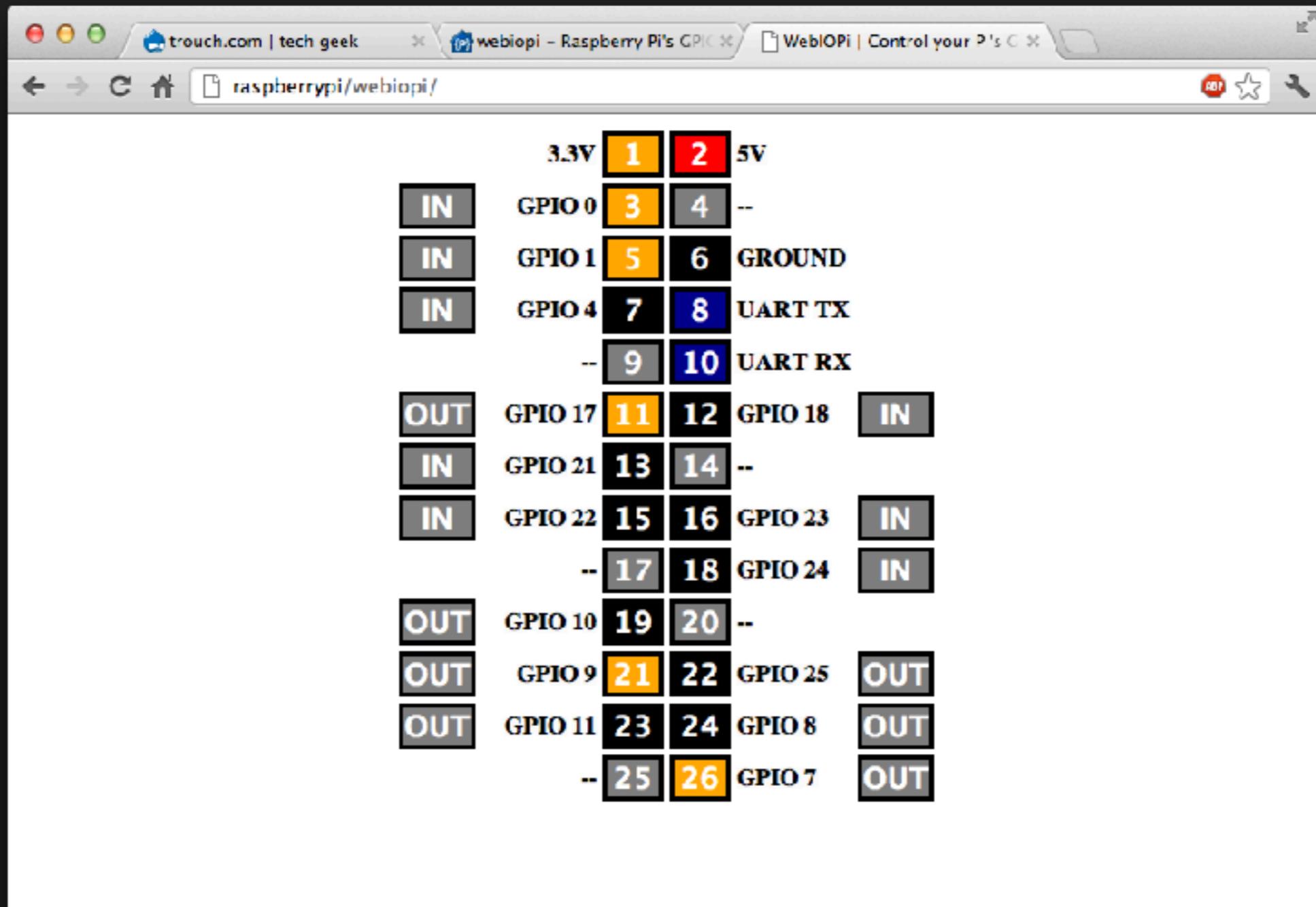


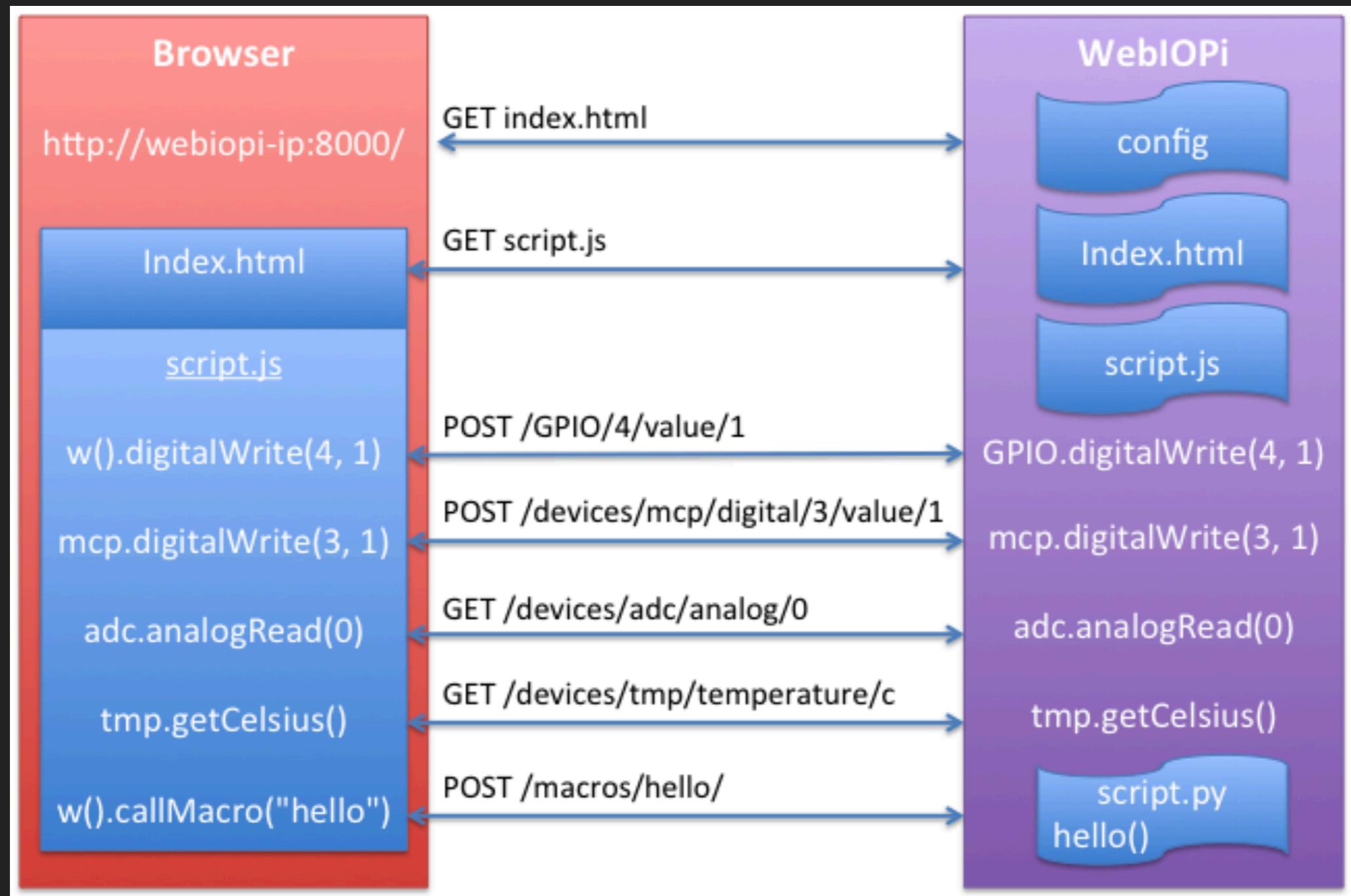
OVERVIEW



THE CORE FRAMEWORK

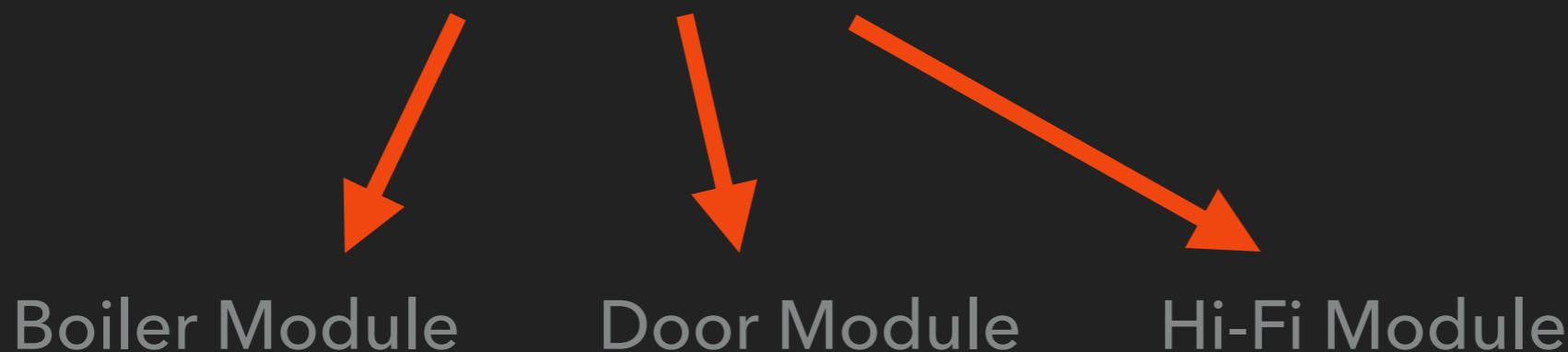
- ▶ One of the first IoT platforms, named Webiopi
- ▶ Written in python
- ▶ HTTP python server provides HTML interface
- ▶ Same python server provides REST API
- ▶ Javascript makes synchronous calls to python server





CONFIGURATION

- ▶ Create the interface, use of specialised JS library
- ▶ Configure framework's options.
- ▶ Create the central Python script.



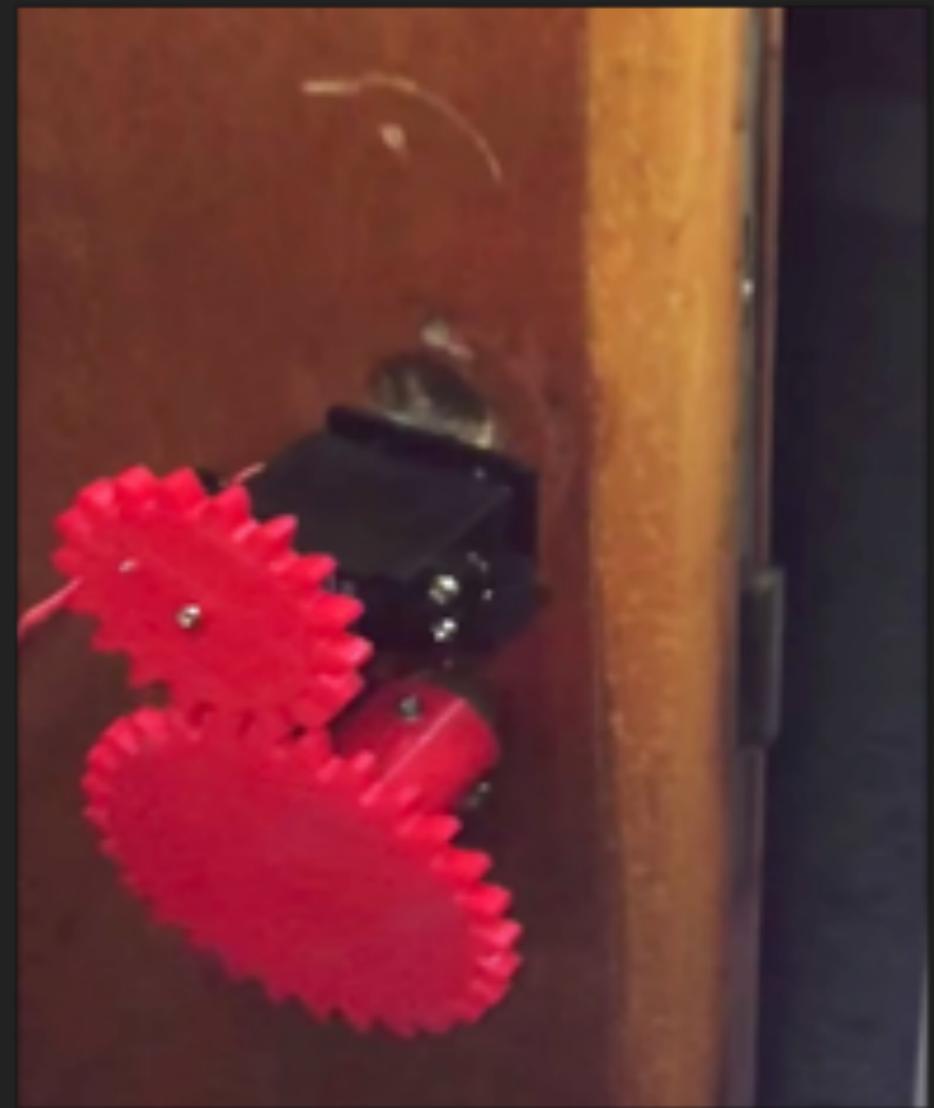
LIBRARIES USED

- ▶ Python:
 - ▶ Pi-switch, Vncdotool, Pywit
 - ▶ Selenium, Pywin32, flask
 - ▶ Fbchat
- ▶ Other:
 - ▶ Lirc, aREST



DOOR MODULE

- ▶ Use of special door lock with handle from the inside
- ▶ Use of 3d printed cogs & servo
- ▶ Servo can be controlled from any MCU
- ▶ Reed switch is used to detect door status (open - close)



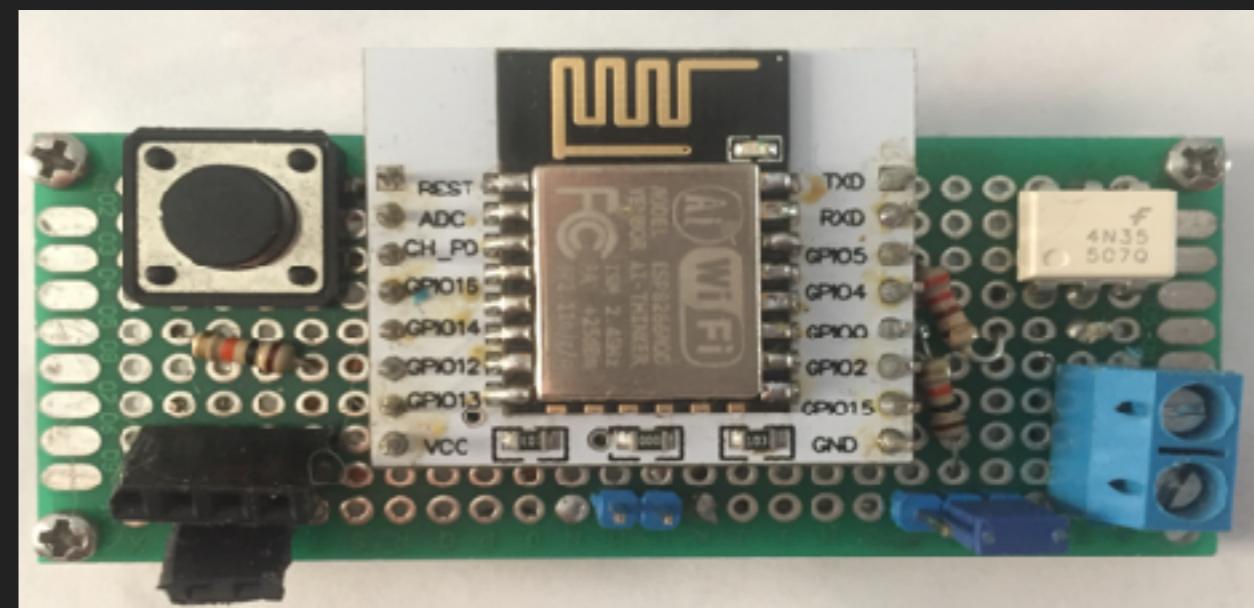
BOILER MODULE

- ▶ Power Relay interrupts the connection of the boiler with it's switch
- ▶ Power Relay is controlled from a RF switch
- ▶ RF switch is controlled from a RF transmitter connected to Raspberry.



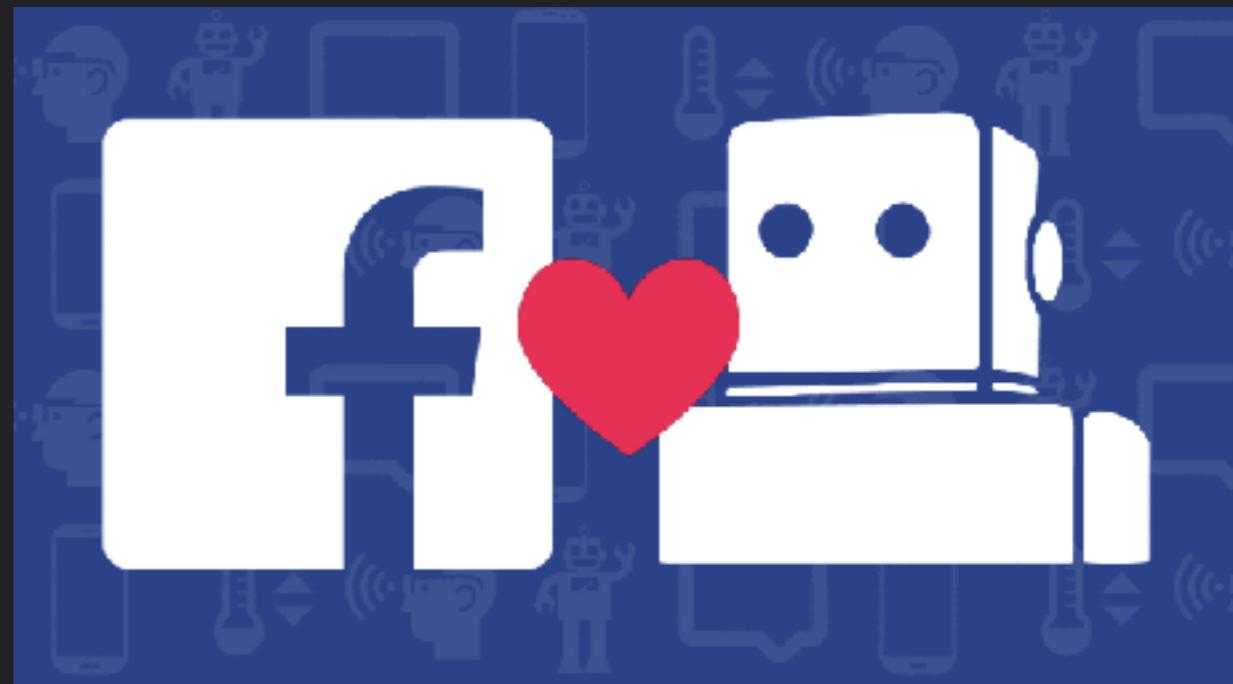
ESP8266

- ▶ IoT MCU manufactured by Espresif,
cost = 1-2 \$
- ▶ Use of community built Arduino
firmware
- ▶ Coupled with 4 relays, and a power
supply, we have a smart-strip
- ▶ Mimic button switch by using an
opto-coupler



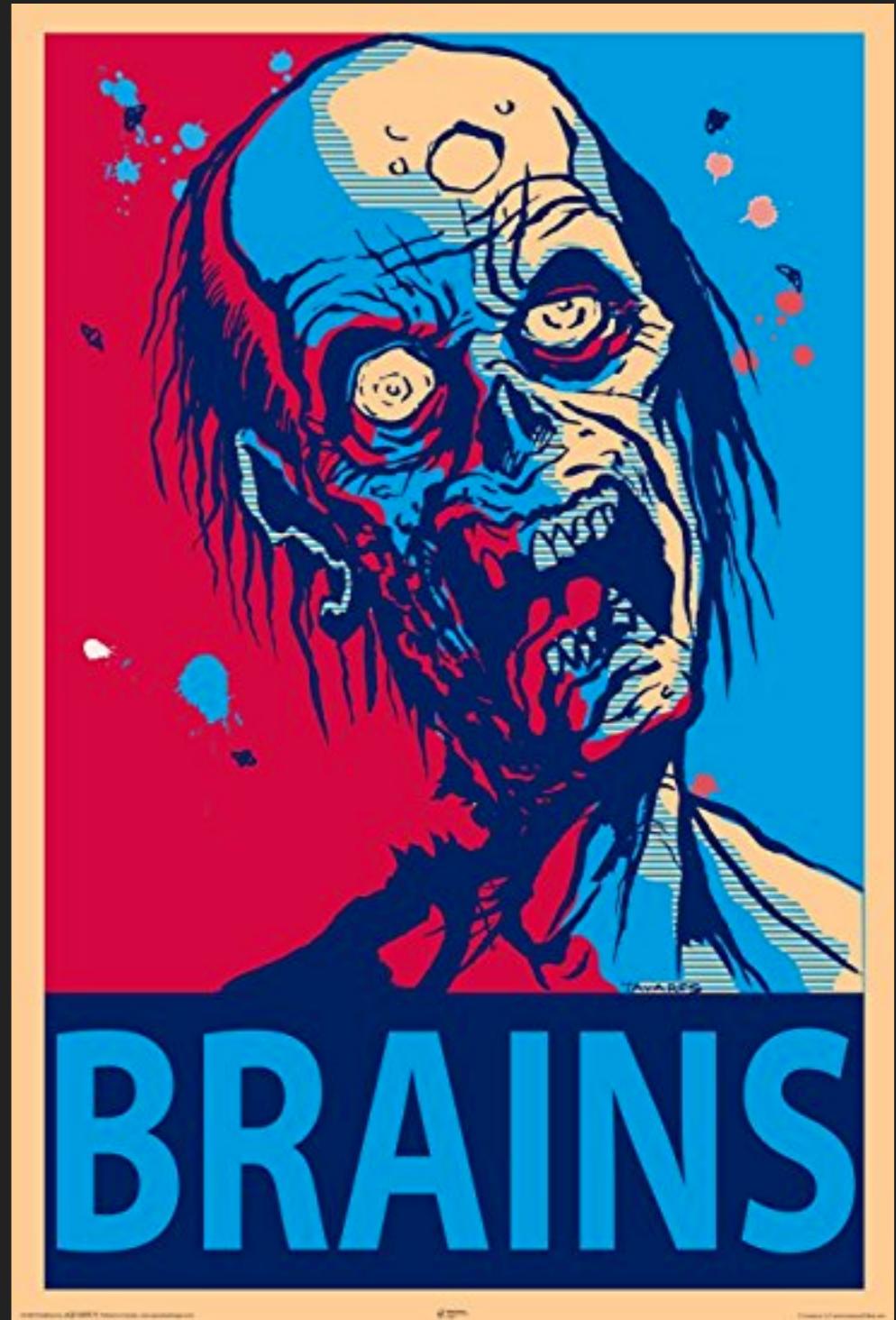
FACEBOOK BOT

- ▶ Use of a Facebook profile.
- ▶ fbchat would simply fetch all incoming messages and send the reply
- ▶ fbchat mimics the behaviour of web messenger
- ▶ Proof of concept, not actual bot



BOT'S BRAINZ

- ▶ Need of Natural Language Processor, use of WIT.ai
- ▶ Train bot to extract the correct meaning from a range of expressions
- ▶ Bot can understand variations, as also the place of a word in the phrase



ανοιξε τον θερμοσιφωνα για 30 λεπτα

action

open

heater

boiler

intent

heater_control

sentiment

negative

time_custom

30

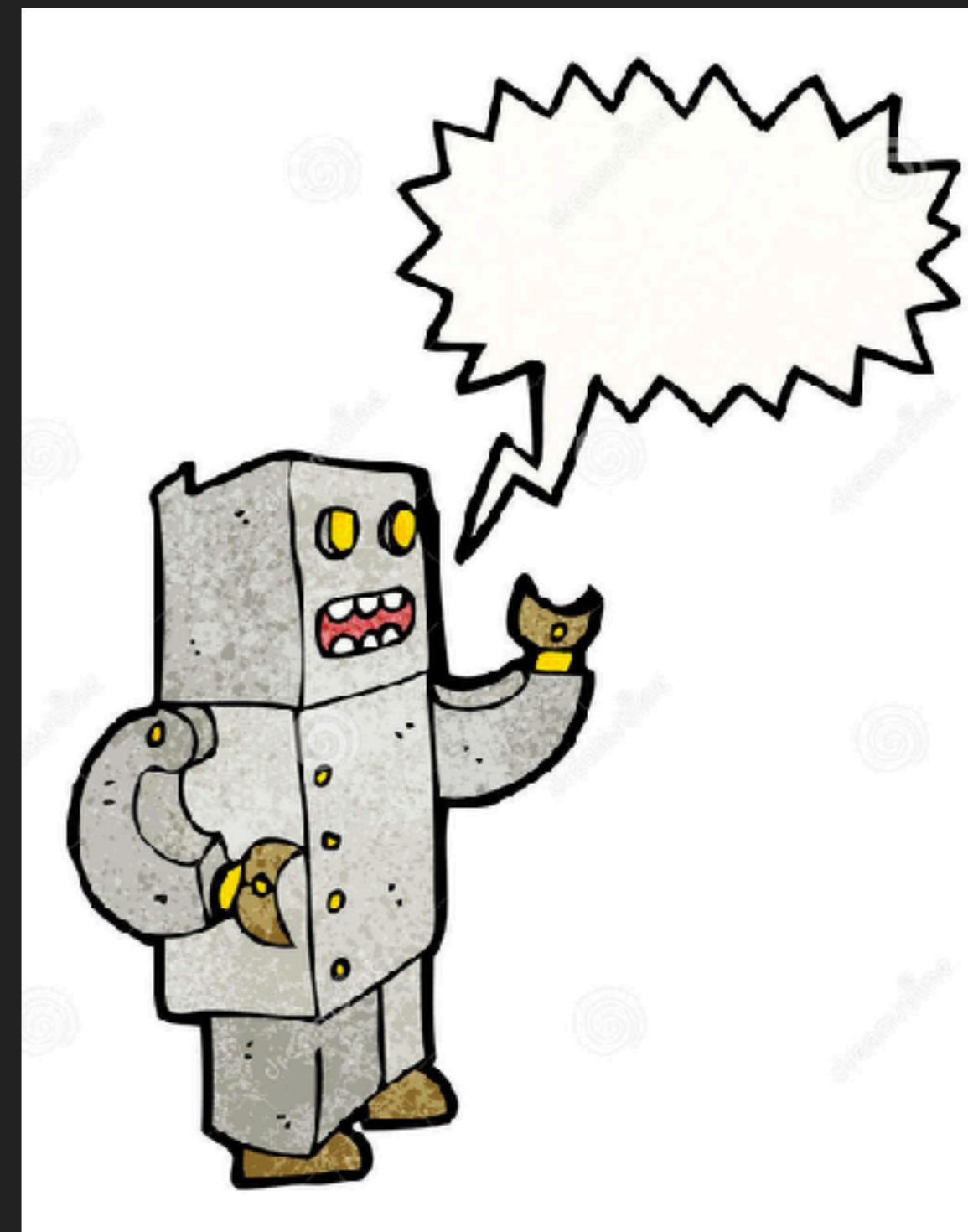
time_type

minutes

Add a new entity

DISCUSSIONS

- ▶ Bot can be trained to follow certain “stories”
- ▶ A story is a conversation, the bot replies according to the user’s reply.
- ▶ The rules can be directly integrated into the bot.
- ▶ The decision making in the client program stays minimum



heater



heater (context)



s_positive && ctime && timetype && open

no_ctime && open

uncertain

turn_off



Τον ανοίγω για {ctime} {timetype}. Ειδες,
πόσο καλά τα πάμε όταν είσαι ευγενικός;



Variable

Set quick replies

end (context)



Updates context keys with...



Bot sends



Bot executes



Jump

CONCLUSIONS

- ▶ The system is highly tailored to the apartment
- ▶ The reliability is somewhat poor
- ▶ Security is non-existent, adequate for the project's needs
- ▶ It was accomplished with no knowledge
- ▶ Thousands of projects and platforms to choose from
- ▶ Everything is Fucking Open Sourced

DREAM BIG ,START SMALL,
BUT MOST OF ALL... . . .

START

Simon Sinek