TUM WS17/18
Selected Topics in Software Engineering - Internet of Things and Services (IN3050)
Project proposal

You Shall (Not) Pass - Smart Door

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Project description

Our project is a controlled access system - Smart Door. The best description of the project is with a use scenario: Smart Door has camera, distance sensor and LED indicators. When someone steps in front of the door distance sensor detects that state and triggers the camera to take a photo of the guest's face. The taken photo is than sent to external web service for inspection. First, face detection is made. If the photo doesn't contain a face (false positive), nothing happens. If there is a face on the photo, check is performed to see if the face is in the list of host's registered guests. Users (hosts) maintain a list of their guests through web interface. Every guest is characterized with a name and a photo of the face. The user has the ability to approve or deny access to any guest at any point in time. If the taken photo contains a face of approved guest the door will open (indicated with a green LED), if the face is in the denied list the door will remain closed (indicated with a red LED). If the face is not in the list the user will be prompted to decide is the face approved, denied or to ignore it completely. Faces can be added or removed. Every door activity is logged in convenient format.

Features

- Detection of persons in front of the door
- Face detection and recognition using external web service
- Opening/closing door according to the face in the photo
- Adding new faces and changing the status of a face (approved/denied)
- Log of all door actions (e.g. guest X entered at Y time, guest X was denied access at Y time)
- Real prototype of the door with servo motor for opening/closing mechanism (optional)
- Speakers with sounds for approved and denied access - "You shall (not) pass" (optional)

Mashup Tool : Node-RED

Parts list

- Raspberry Pi, power cable, memory card
- Ultrasonic Distance Sensor
- Pi Camera
- 1 red, 1 green LED (or 1 RGB LED)
- Servo motor (optional)
- Speakers (optional)