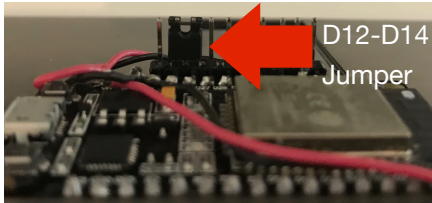


WiFi Login Setup

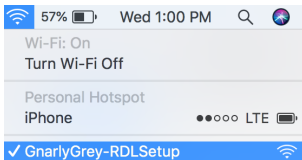
1. Add Between D12 and D14 on Back of Device

With the device 'off' connect a jumper as shown on the back of the WiFi module.



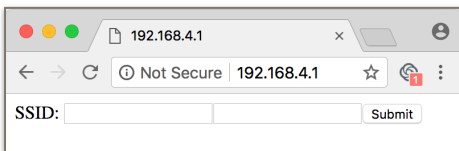
2. Device Boot and Connect to WiFi Hotspot

Power on the device with the provided USB power supply (1A or greater AC/DC converter). Look for the WiFi network "Gnarlygrey-RDLSetup" and connect to it.



3. Open <http://192.168.4.1/> in Web Browser

A webpage will load to enter you WiFi network credentials. Enter the name and password of the WiFi network you wish to connect to. Then press the 'Submit' button.



The webpage will stall for a while and then no longer find the webpage at that IP address. This is because the device has rebooted. The WiFi login credentials have been successfully updated.

4. Power Off the Device and Remove Jumper

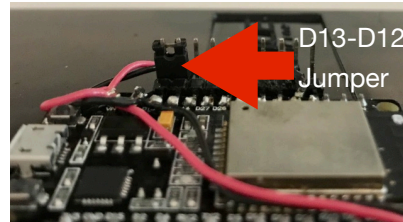
The device should now be successfully configured to connect to your WiFi network!

FPGA Firmware Update

Occasionally, there may be firmware updates to improve the FPGA design. For this reason, the FPGA firmware for the device can be updated over the web.

1. Add Between D13 and D12 on Back of Device

With the device 'off' connect a jumper as shown on the back of the WiFi module.



2. Power on the Device

Power on the device with the provided USB power supply or through any USB port.

3. Observe Local Blue LED on Back of Device

The device will connect to the WiFi network configured in 'WiFi Login Setup'. Once connected the blue LED on the Wifi module (back side of the board) will be lit during the firmware downloading.

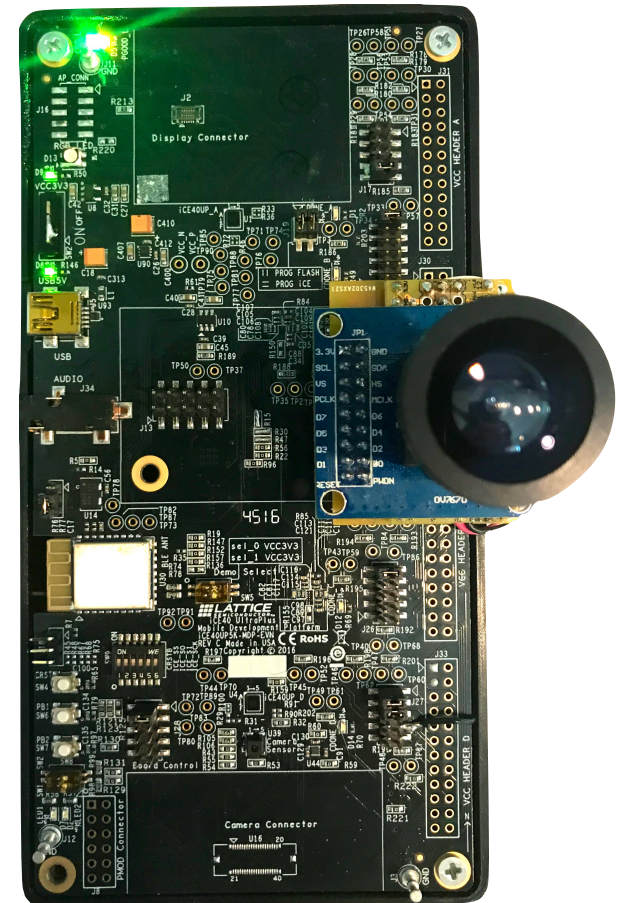
4. Wait for Blue LED to Flash

Once the Blue LED starts flashing the FPGA firmware has been successfully updated. Power off the device and remove the jumper from step 1.

Debug and Troubleshooting

Debug information is available via terminal and virtual com port. Connect a micro USB cable to the WiFi module. The baud rate is 115200.

Edge + Cloud Person Recognition Demo



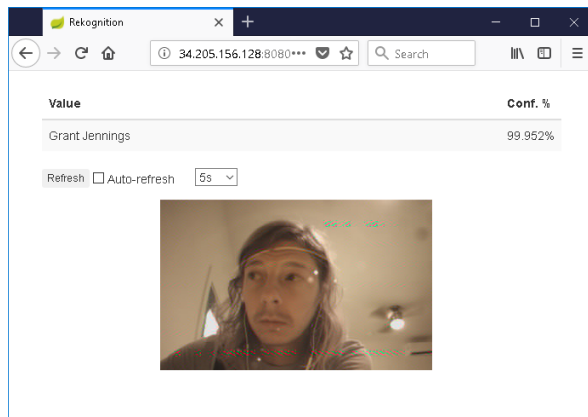
Demo Overview

Local Face Detection

Lattice UltraPlus FPGA and an image sensor are used to detect if a face is present in the camera field of view or not. If a face is present an LED lights up and an interrupt is sent to an additional FPGA and WiFi module for additional cloud based person recognition.

Cloud Based Person Recognition

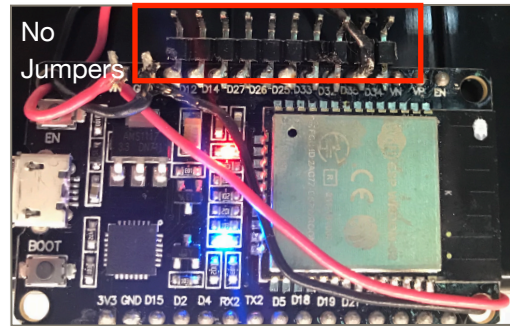
Upon receiving a local interrupt trigger from the local face detection engine, the image is sent through a JPEG encoding engine to compress the image by over 10x. The image is sent to a web server, which invokes the AWS (Amazon Web Services) Rekognition API. The web server uses the API to detect if a face is present or not. If a face is present the API is used to compare the face against a database of known people. If the person is found in the database their name and image is displayed on a webpage. Otherwise, "Unknown Person" is displayed along with a textbox to enter the new persons name into the database. The next time the person is seen their name will be displayed in the webpage.



Device Operation

1. Ensure No Jumpers on Back of Device

With the device 'off' remove all jumpers from the 1x10 header on the back of the device.

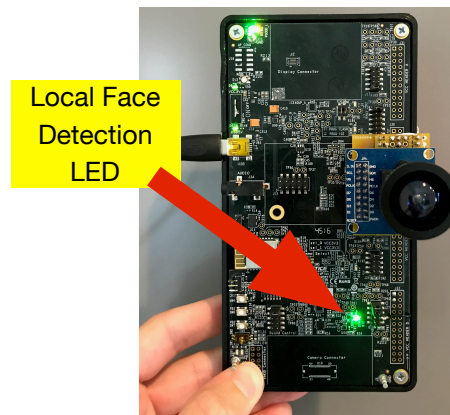


2. Power on the Device

Power on the device with the provided USB power supply or through any USB port. Device should connect to the WiFi network set up in 'WiFi Login Setup'.

3. Observe Local Face Detection Results

Point the camera of the device at your face. Observe the green LED (D4) light up. Move the camera away from and towards your face. The Green LED will only light up when a face is present in the camera's field of view.



4. Open <http://34.205.156.128:8080> in Browser

A webpage will load showing the latest image and person recognition results. Images are only loaded to the webpage when the local face detection engine as identified a face is present in the image.

Cloud Based Person Recognition Results:

No Person Found -

If no face is detected in the image shown on the webpage the webpage will indicate "No Person Found."

Unknown Person -

If a person is detected in the image, but they have not previously been entered in the person recognition database the webpage will indicate "Unknown Person." The browser will at that time provide a textbox, where you can enter the name of the person in the image. It is recommended to turn off the "Auto-refresh" button in the webpage while entering the name to avoid reloading of the webpage.

Known Person -

If a person is detected in the image and they have previously been entered in the person recognition database the webpage will display the name of the person and the confidence level at which they are believed to be that person.