Project Progress of Smart Trash Bin

Update Function

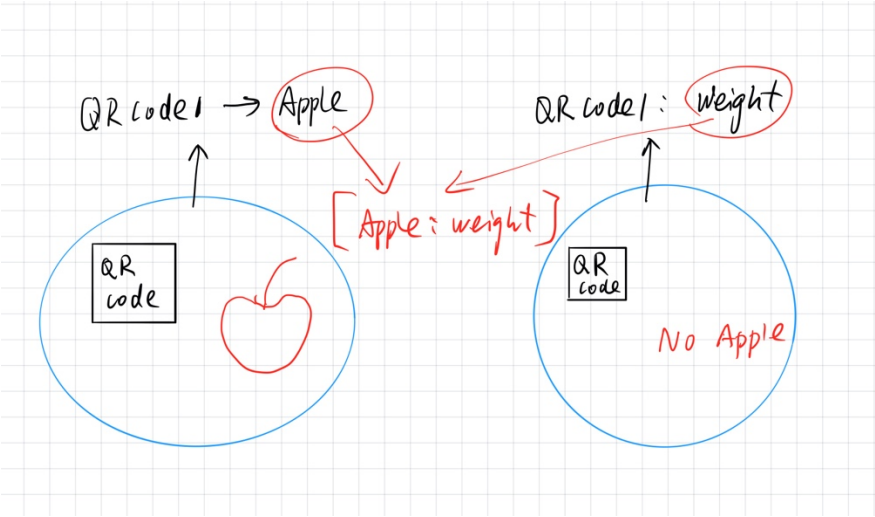
1. **System execution process：**

   a) The signal of the **weight sensor as a switch**, the weight beyond the threshold, the camera **automatically takes a capture and record weight**
   b) PC **automatically downloads all captures** from Raspberry Pi
   c) Then, The PC begin to **analyzes all photos**, **predict the categories** and **record weight** of each photo, and **stores them** in a dictionary.
   d) The PC **calculates** the corresponding **carbon dioxide emissions** based on the **accumulated weight** and **type**
   e) We designed a GUI, an .exe file, which can display a variety of statistical data (quantity, weight, carbon dioxide emissions, etc.) in the form of a pie chart

Change of target

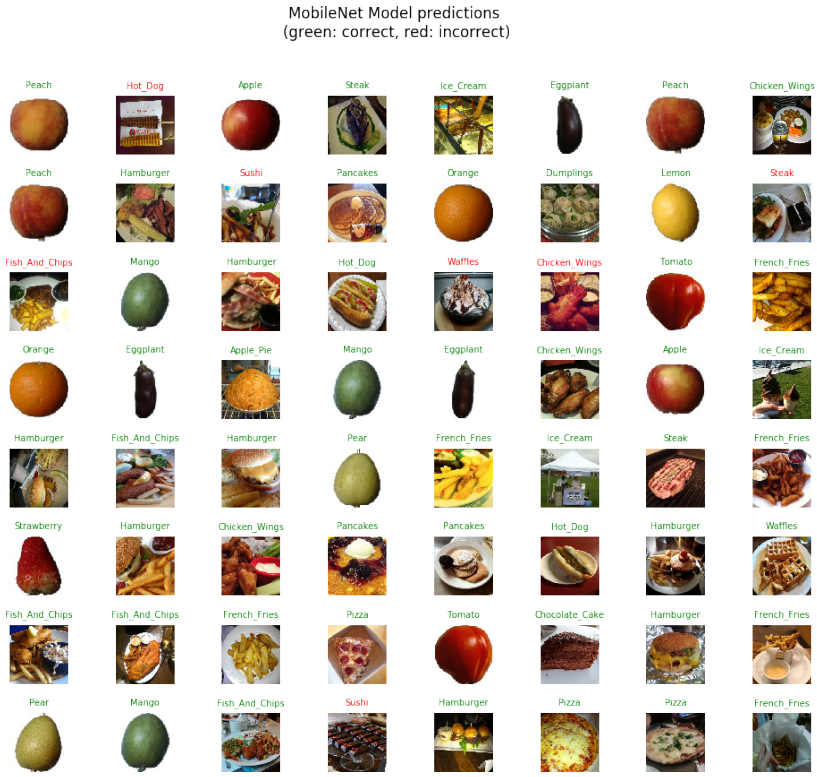
Through communication with Paul, in order to make the neural network work better, Paul changed the use of the project.

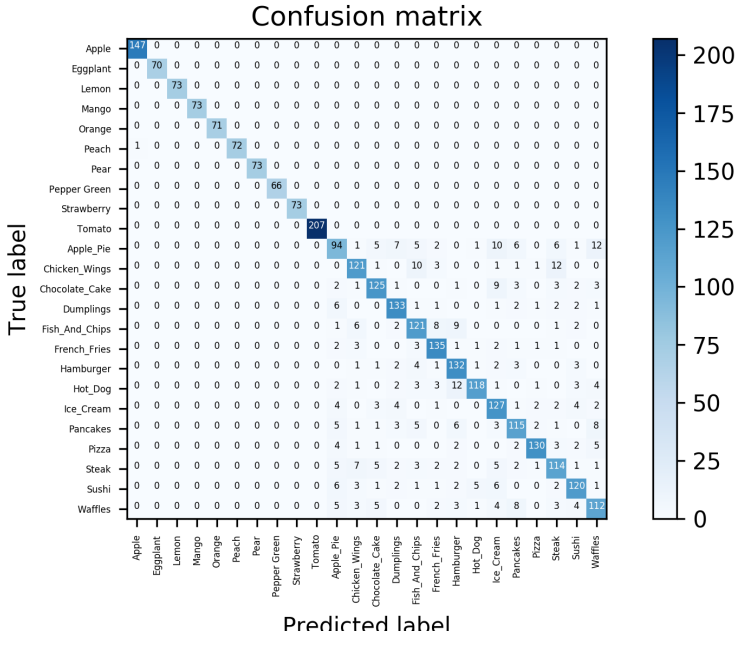
1. The **food passes** through the **device** when it is **complete**(haven't been eaten), at which time the device **records** the predicted **categories** and the corresponding QR code on the plate
2. When the **food is finished, return to the device**. At this time, only the **QR code** and **weighed** are recognized.
3. **According to the QR code on the empty plate, find the categories** of food. Through the connection of the QR code, at this point we have **obtained** both the **label and weight**



CNN training

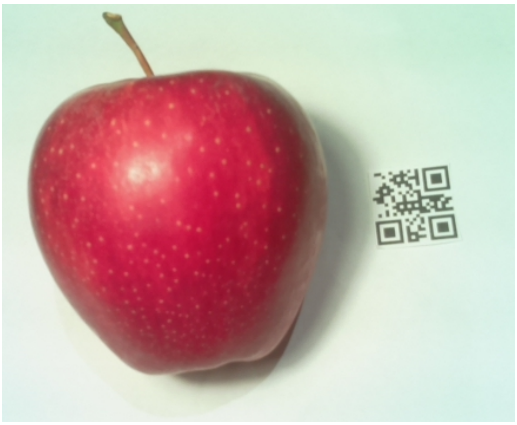
We have rained the accuracy of CNN to 98% for classifying 24 categories



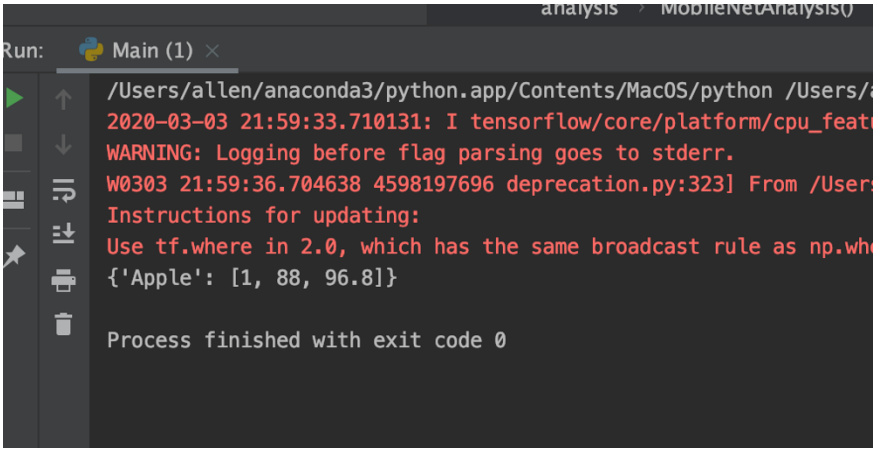


Confusion matrix

Experimental test



Capture of Rasp PI



analysis of picture above

label: Apple: [count: 1 time, weight 88g, CO2 emission 96.8g]

Here we just took two pictures with Raspberry Pi, but the program can process many pictures in batches.