Slate8

Progress #3

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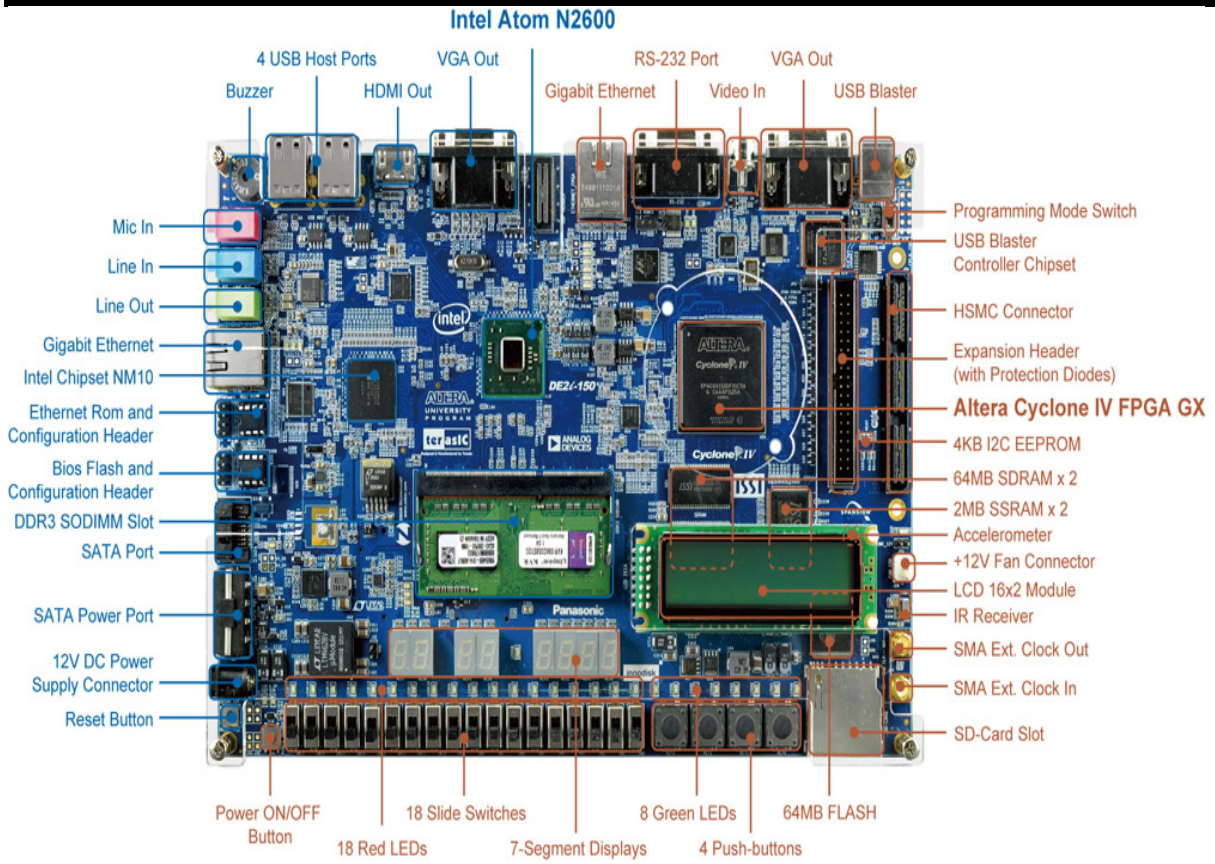
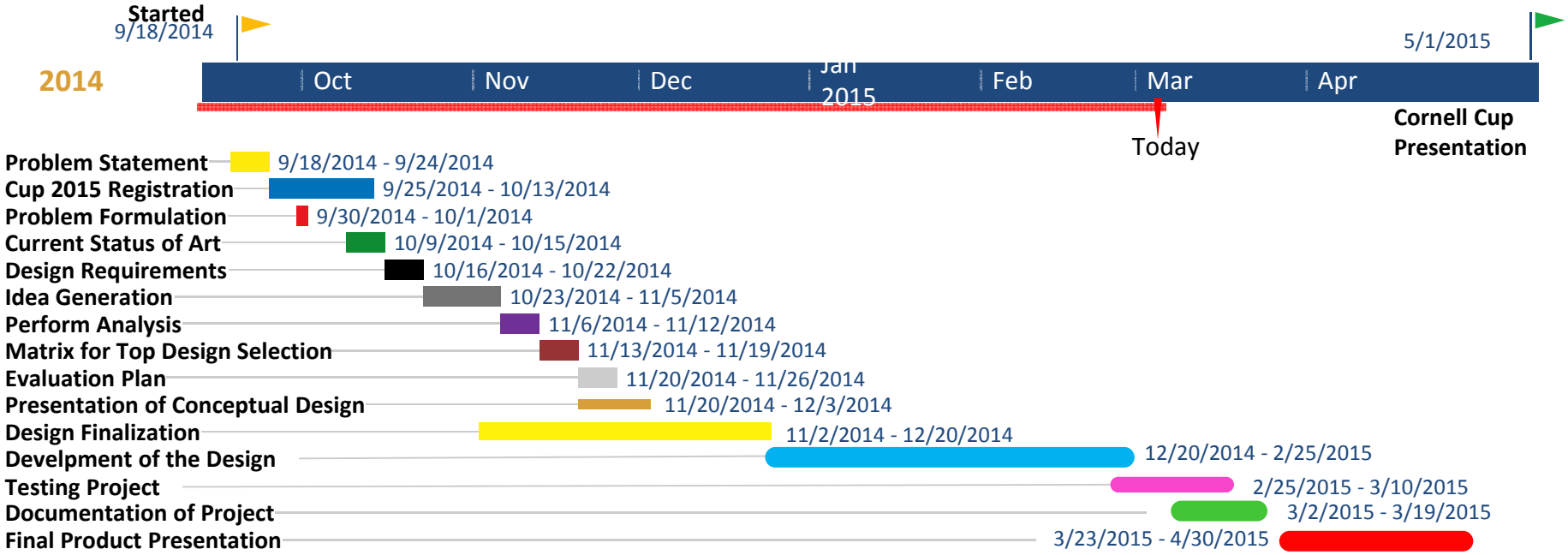
Final Design



The final design will use the intel de2i-150 board. This board has an LCD screen equipt. The tablet's size will be roughly the size of this board. A usb camera, micro SD storage wil be the peripherals added.

Timelines and milestones



Timelines and milestones

Started
9/18/2014

5/1/2015

2015

Progress

02/18/15 - 03/04/15

Cornell Cup Presentation

Images of the letter A taken for database

Recognition of letter A

OpenCv Software implementation

Final Design on Prototype

Highlights of the Period

POSITIVE IMAGES

We took photos of the hand we want to detect,(letter A) about **200 of them**, which we can then use to generate positive samples OpenCV which can work with our system. It’s also important that they should differ in lighting and background.

Highlights of the Period

NEGATIVE IMAGES

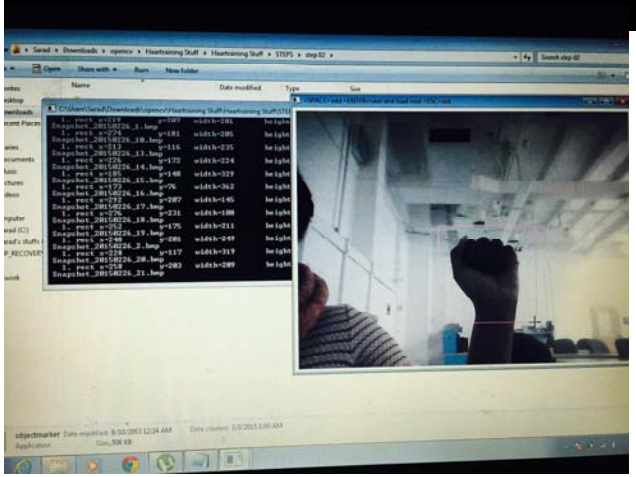
We need at least **600** of them. Now we need the negative images, the ones that don’t show a hand. In the best case, if we were to train a highly accurate classifier, we would have a lot of negative images that look exactly like the positive ones, except that they don’t contain the object we want to recognize.

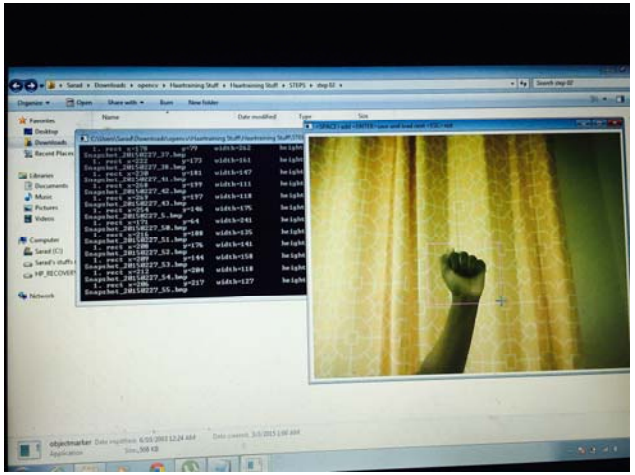
TRAINING THE CLASSIFIER

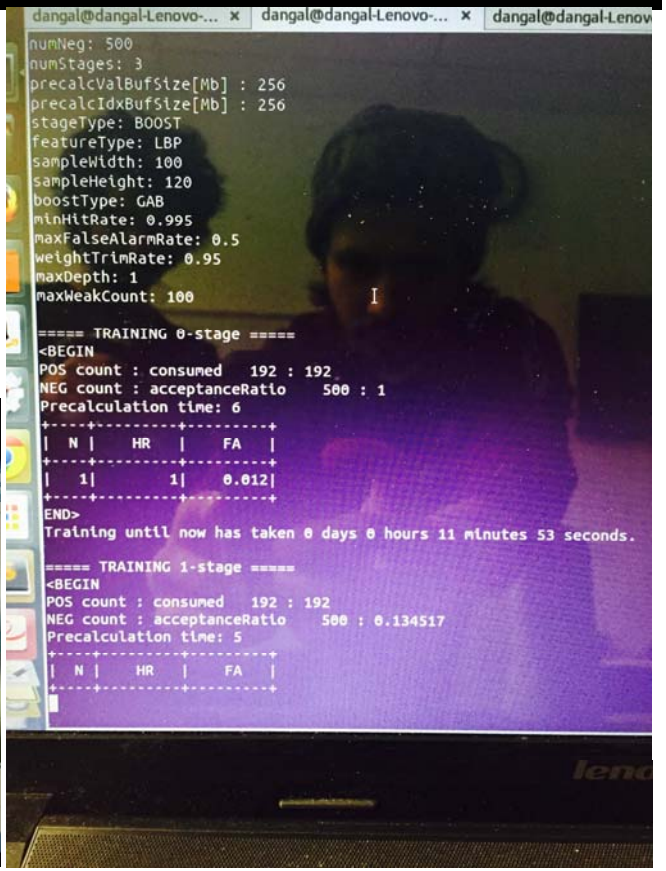
- OpenCV offers two different applications for training a Haar classifier: **opencv_haartraining** and **opencv_traincascade**.

- We are going to use opencv_traincascade since it allows the training process to be multi-threaded, reducing the time it takes to finish, and is compatible with the newer OpenCV 2.x API.

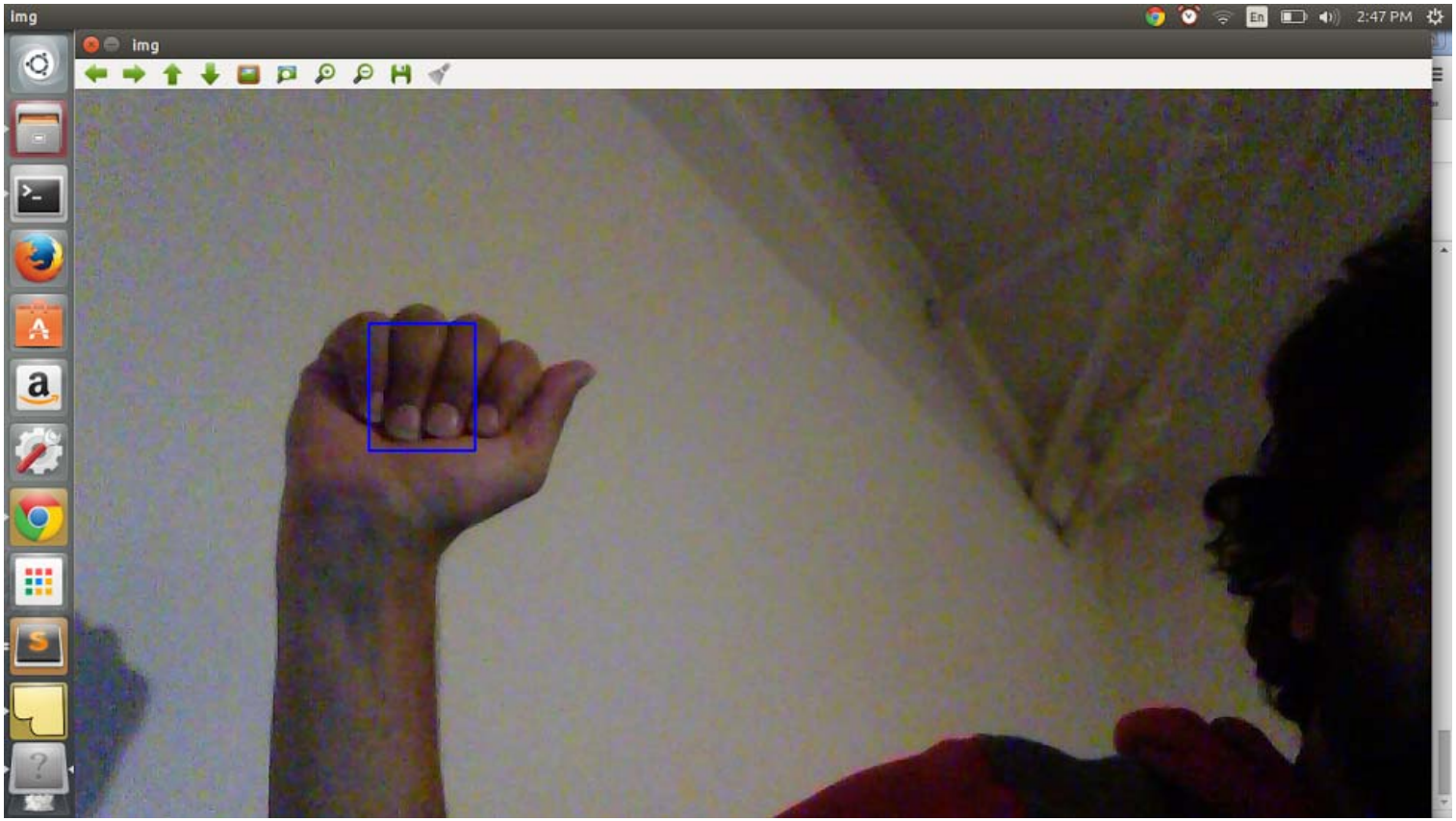
Highlights of the Period







Highlights of the Period



Low Lights

- **Still need to improve training of the Haar classifier for better result**
- **Currently, we trained the classifier for 2 stages and 3 stages.**

- **Issue connecting the camera with Yocto Linux as some libraries couldn’t be installed**
- **Troubled installing drivers for camera with A/V**

Highlights of the Period

Changes made from the previous period

Number of Images (200 positive)

Change of Camera

Explanation of the demo/hardware (completed so far) details

Sign Letter “A” detection

Installed some libraries for Yocto Linux on De2i-150 board for running python

Risk Mitigation Measures

Risk	Probability	Impact	Risk Control and Management
Failure to translate the letter **A** in comparison to other signs	0.2	5	Work harder on code detection
Implementation was not successfully transmitted from OpenCV into to the board	0.1	5	Connect the Intel Atom with different computer and study harder on the data process and the entire system
Issues detected the USB camera into the board	0.1	5	Review the compatibility of the USB camera to the board.

Next Implementation

- **Have the trained system be able to differenciate the recognized sign from other signs**
- **output result as text**
- **Once the system works properly, train it for all of the letters**
- **Implement UBUNTU and install openCV on the de2i-150 board**
- **Be able to perform all of the functions that are done on the laptop, on the board**

Questions ?