GUJARAT TECHNOLOGICALUNIVERSITY

Chandkheda, Ahmedabad Affiliated

GOVERNMENT ENGINEERING COLLEGE, DAHOD

A Project Report On

Face Detection Model

Under subject of

DESIGN ENGINEERING – IIA

B. E. Semester – V

(Computer Branch)

Submitted By :

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Academic year

(2019 - 2020)

GOVERNMENT ENGINEERING COLLEGE, DAHOD
COMPUTER ENGINEERING DEPARTMENT

CERTIFICATE

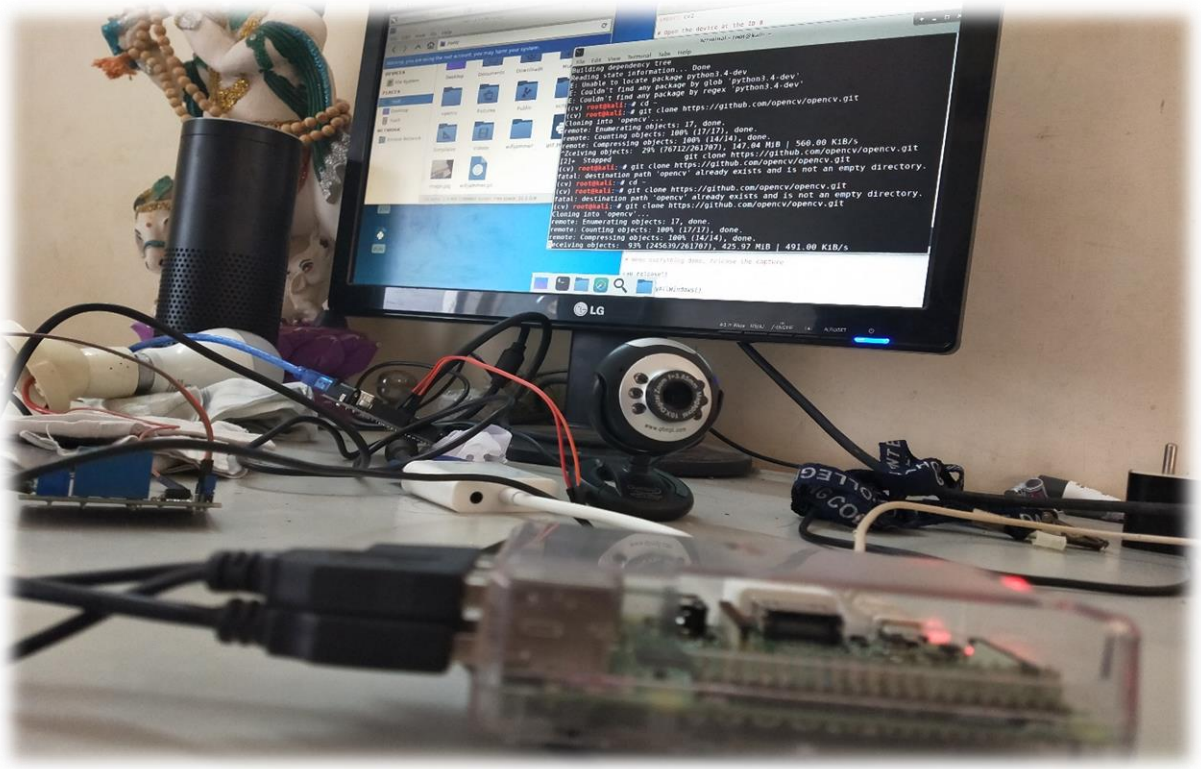
This is to certify that Mr Patel S. Malhaar (170180107034) and Mr Abhay Singh Rajput (170180107049) and Mr Shivam J. Tyagi (170180107058) and Mr. Kaydawala Hamza S. (180183107007), of Computer Engineering 5th semester having done their term work of Design Engineering- 2A (2130005) having within the four walls of institute with the necessary visits of the domain.

Signature of Faculty: Signature of H.O.D

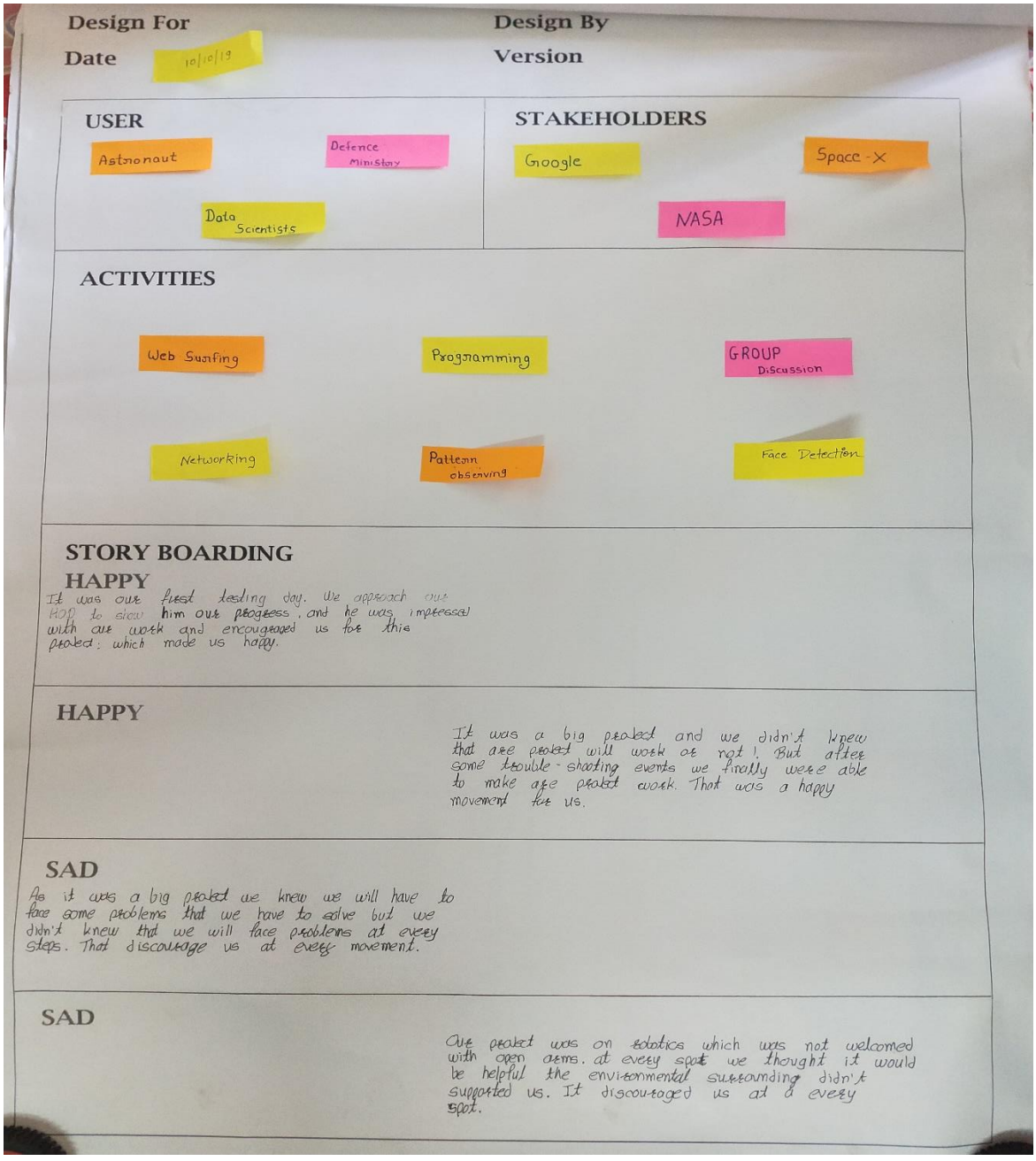
INDEX

1.1 Design Thinking

A face detection algorithm is very specific to the kind of problem and cannot be guaranteed to work unless it is applied and results are obtained. We have followed a multiple algorithm approach for face detection, which is in effect a series of simple rejection blocks. In designing the final algorithm many different schemes have been tried. The first step is skin segmentation, which is good enough to reject most of the data. Thus this forms the first step of the final algorithm also. Neural networks have also been applied (which is described later) but have not been included in the final algorithm. As the data gets more compact and we need more specific rejection classifiers. Fisher Linear Discriminants and Template matching are found not to perform as well as eigenface method. So in the final version we used eigenface projection method. In the overall algorithm there are many parameters that have to be decided by experimenting, and are chosen with respect to optimality of result, runtime etc.



Chapter 2: Empathy Mapping



2.1 Who does the Subject relates to… i.e. Stakeholders?

Stakeholders are the persons that are directly or indirectly related to the work we are going to use.

User	Stakeholders
1. Astronaut	1. Google
2. data scientists	2. Nasa
3.Defence Ministry	3.Space-x

Activity

- Web surfing
- Data scientists
- Programming
- Group discussion
- Face detection
- Patten observing
- Networking

Story Boarding:

Sad

As it was a big project we know we will have to face some problem that we have to solve but we didn't know that we will face problem at every steps that discover age us at every movement.

Sad

Our project was on robotics which was not welcomed with open arms at every spot we thought it would be helpful the environmental surrounding didn't supported us.it dis cover aged us at a every spot.

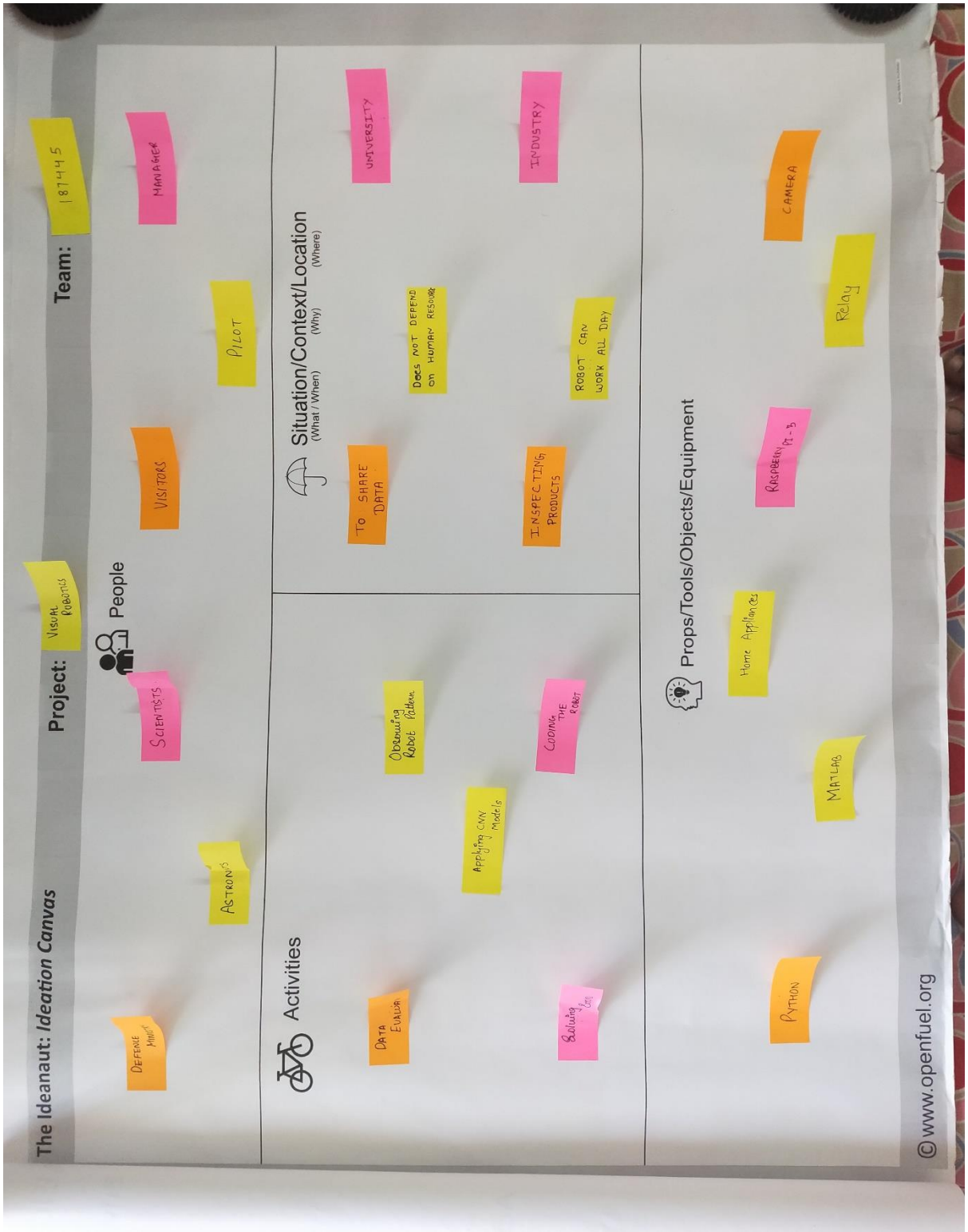
Happy

It was our first testing day. we approach our hod to show him our progress and he was impressed with our work and encouraged us for this protect which mode us happy.

Happy

It was a big project and we didn't know that are project will work or not. But after same trouble shooting event we finally were able to make age protect work that was a happy movement for us.

Chapter 3: Ideation Canvas



People

- Defence Ministry
- Astronauts
- Scientists
- Visitors
- Pilot
- Manager

Activities

- Data evaluation
- Observing robot pattern
- Applying CNN models
- Coding the Robot
- Solving errors

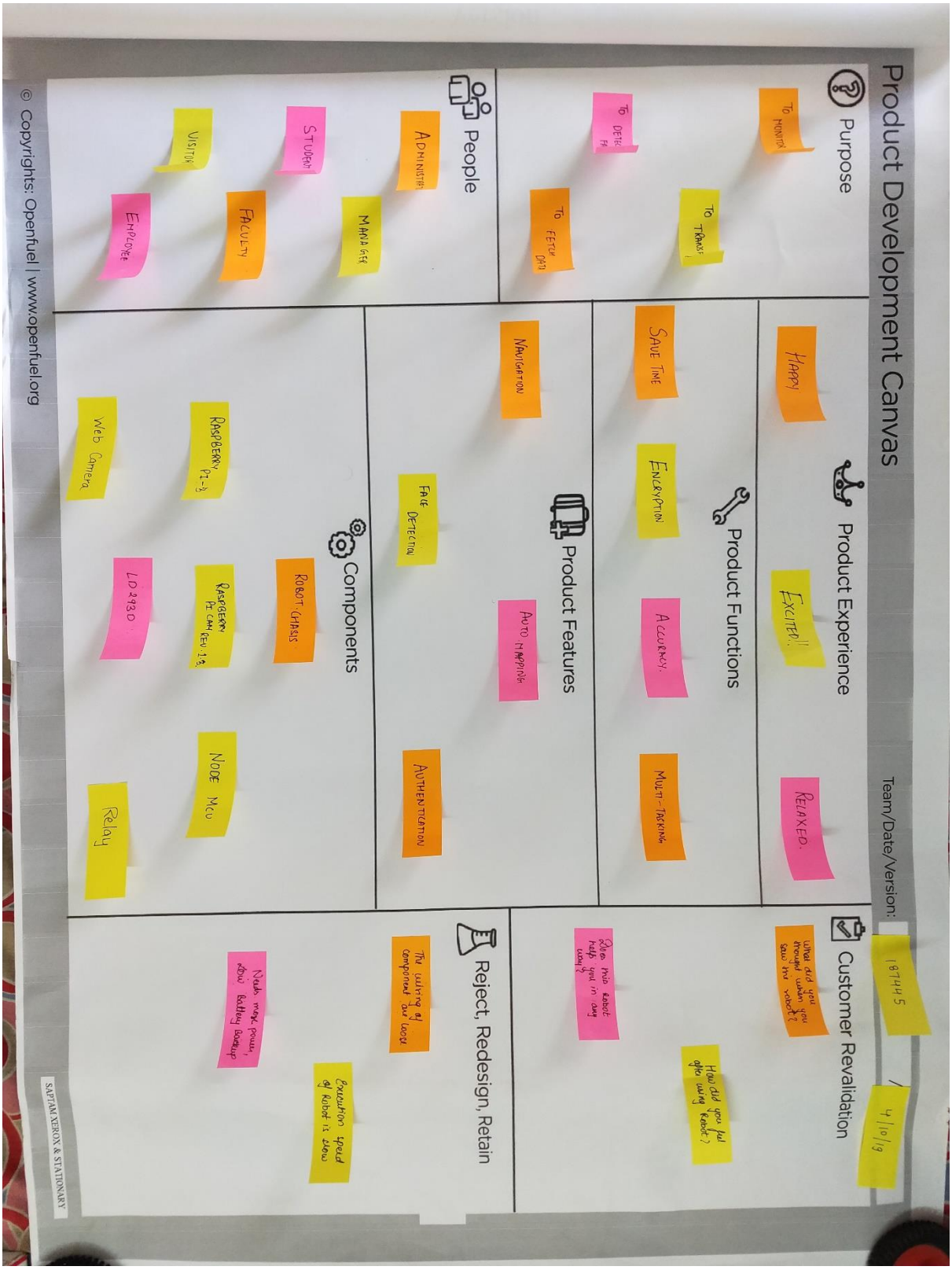
Situation /context/location

- To share data
- Inspecting
- Industry
- University
- Does not depend on human resource

Props/tools /objects/equipment

- Python
- MATLAB
- Home appliances
- Raspberry pi 3
- Relay
- Web Camera

Chapter 4: Product Development Canvas



Purpose

- To monitor
- To transfer files
- To detect failure
- To fetch data

People

- Administrator
- Manager
- Student
- Faculty
- Visitor
- Employee

Product Experience

- Happy
- Excited
- Relaxed

Product Functions

- Save time
- Encryption
- Accuracy
- Multi tasking

Product features

- Auto mapping
- Face detection
- Authentication

Components

- Robot chassis
- Raspberry pi cam rev 1.3
- LD293D
- Web browser
- Node MCU
- Relay

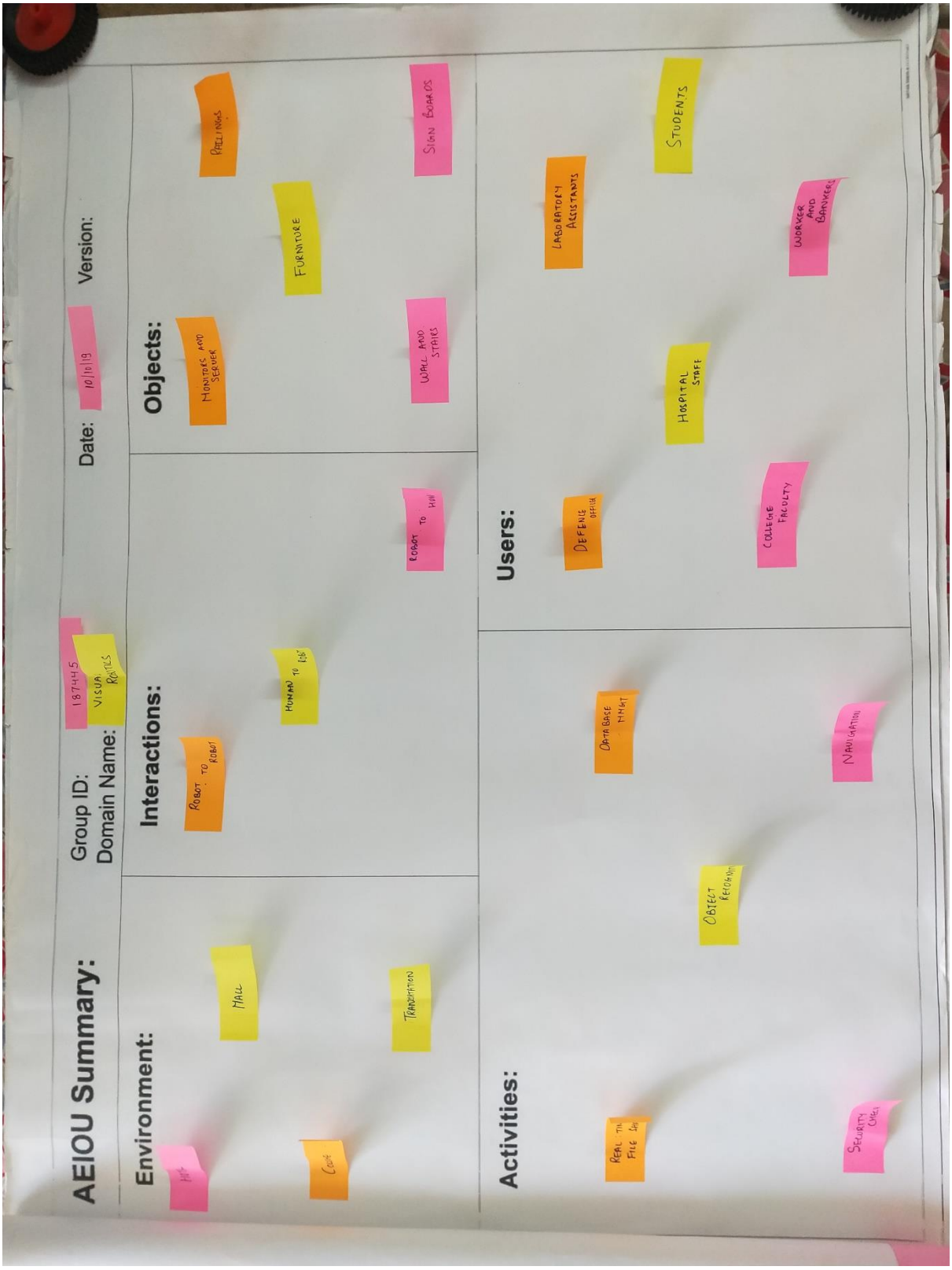
Customer Revalidation

- What did you through when you saw the robot?
- How did you fuel after using robot?
- Does this robot help you in any way?

Reject, Redesign , Retain

- The wiring component are lose
- Execution speed of robot is show
- Needs more power low battery backup

Chapter 5: AEIOU Frame Work Sheet



Environment

- Hotel
- Mall
- College
- Transportation

Interaction

- Robot to Robot
- Human to robot
- Robot to human

Activities

- Real time file sharing
- Security check
- Navigation
- Database mngt
- Object recognition

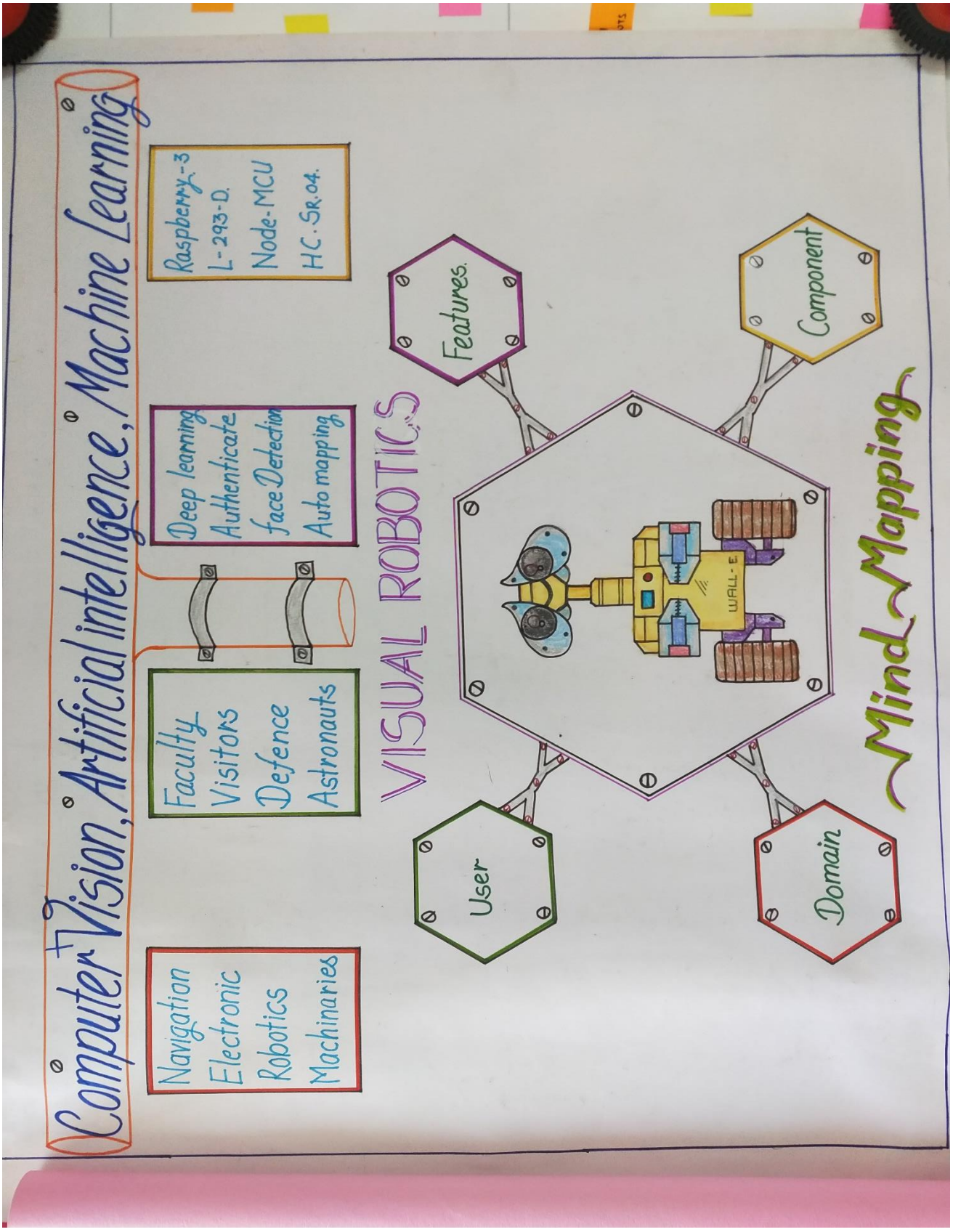
Objects

- Monsters and server
- Furniture
- Wall and stairs
- Sign board
- Railing

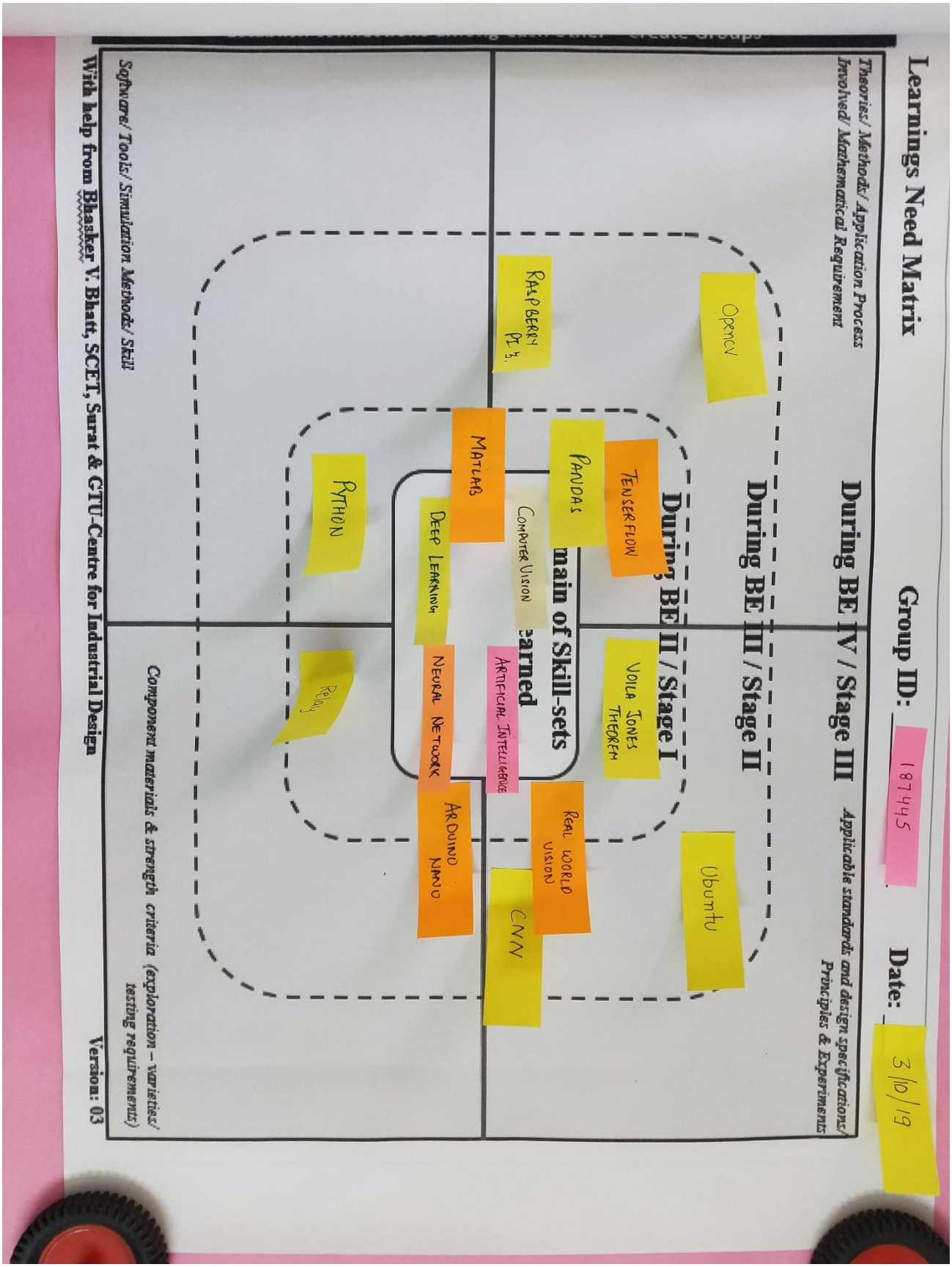
Users

- Defence officer
- Hospital staff
- College faculty
- Worker and bankers
- Laboratory assistant

Chapter 6: Mind Mapping Sheet



Chapter 7: Learning Needs Matrix



Domain skill-set to be learned

- Computer vision
- Artificial Intelligence
- Deep learning
- Neural network

During BEII/stage I

- Pandas
- MATLAB
- Python
- Relay
- Arduino nano
- Relay world vision
- Voila jones theorem

During BEIII/stage II

- OpenCV
- Raspberry pi 3
- Ubuntu
- CNN

Chapter 7: Prototype of the Model

This prototype clearly states the model in execution. Initially the raspberian os was installed in raspberry pi 3. Next step was to install various libraries i.e. numpy, opencv etc. Then the code was developed implementing Convolutional Neural Network(CNN).

Executing the code after setting up the physical GPIO Board pins of raspberry pi 3 to relay and bulb resulted in proper execution of object Detection Model as shown in picture above.

Conclusion:

- A face detection system using Raspberry Pi was developed. The system was programmed using Python programming language. Both Real time face detection and face detection from specific images.
- This phase (Object Detection Model) of complete aimed project wall-e is competed in sem5.
- We learned various ways to communicate b/w different operating systems and aim to continue the same spirit in learning more advanced things.