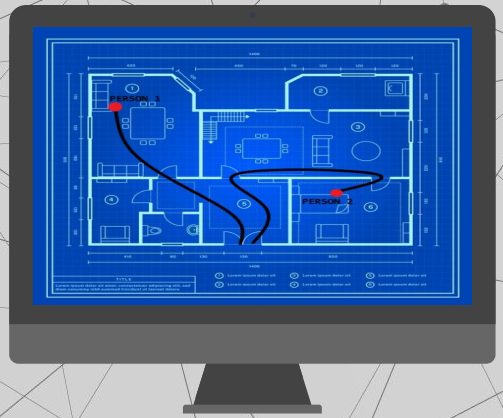
AUTOMATION OF SURVEILLANCE SYSTEMS



Under the Mentorship of:
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Background

- With the growing technology and wealth in the world, there is a high demand for security systems in the market. The security systems prevailing in the market for monitoring a particular area needs to be automated in order to trace someone in case of any mishappening.
- Visual tracking and human path tracing features are picking up pace in the market in order to make human lives easier.
- The goal is to build an application that will aim to automate security systems that will help to reduce time in the identification of individuals and track their movements from a large number of surveillance cameras installed in such places.

SCOPE AND UTILITY

Tracing Unusual Events

Smart Homes

Traffic Monitoring

Ease of Access

Automation in everything

Saves a lot of time tracing through CCTV cameras

OBJECTIVES

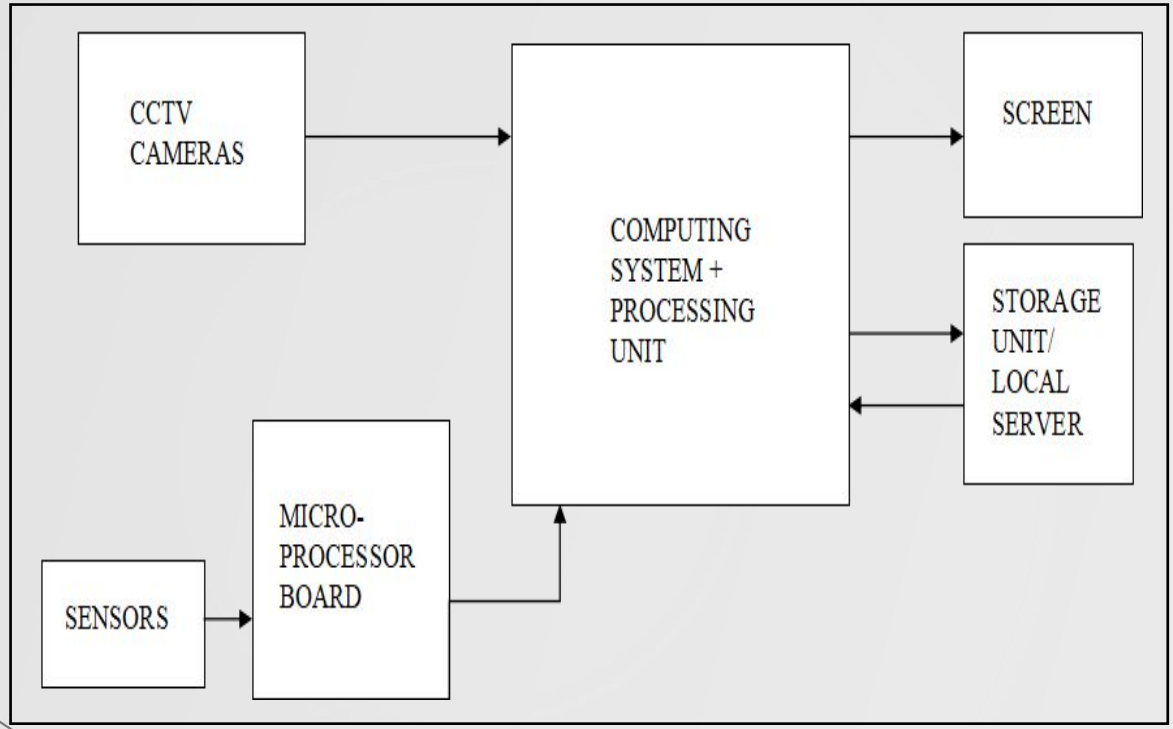
- To study the existing techniques for the real time monitoring and tracking with the help of video surveillance system.
- To propose a novel technique for real time monitoring of the video surveillance system and tracking of individual.
- To validate the functioning of the proposed techniques by testing it in the real time environment.

LITERATURE SURVEY

- Moving Human Path Tracking Based on Video Surveillance in 3D Indoor Scenarios, **a research paper by Yan Zhouabc, Sisi Zlatanovac , Zhe Wanga , Yeting Zhangcd, Liu Liuc, School of Resources and Environment, University of Electric Science and Technology of China** (UESTC)

- Tracking Human Intrusion through a CCTV, **a research by Jayati Ghosh Dastidar, Rana Biswas, in 2015**

ARCHITECTURE OF PROJECT



TOOLS AND TECHNOLOGIES USED

KNOWLEDGE

- Image Processing
- Machine Learning
- Deep Learning
- Object Detection
- Database Management
- Computer Vision
- GUI Designing
- IoT

PYTHON LIBRARIES

- Opencv-python
- scikit-learn
- Keras
- tensorflow-gpu
- numpy
- Scipy
- Pillow
- pyqt
- qtpy
- torch
- Torchvision
- sqlite
- Python-datautil
- vlc

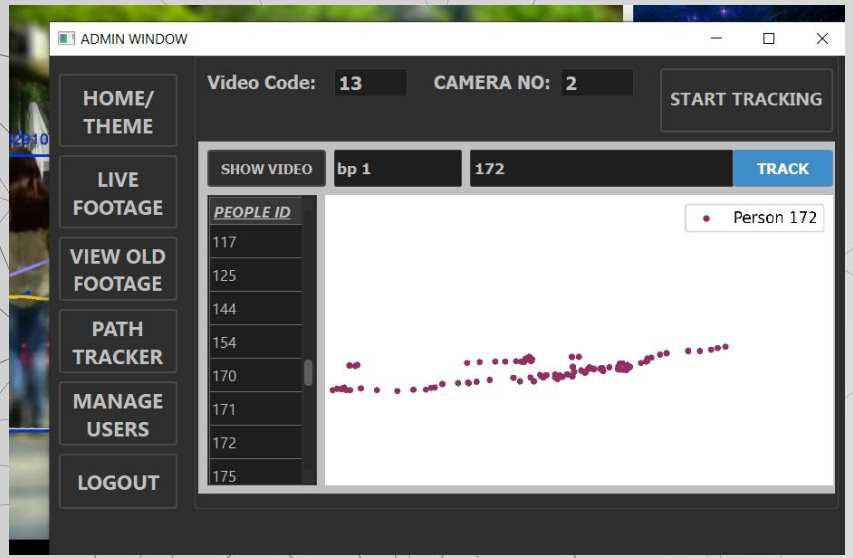
SOFTWARE

- Qt Designer
- SQLite DB Browser
- Python 3.7.6

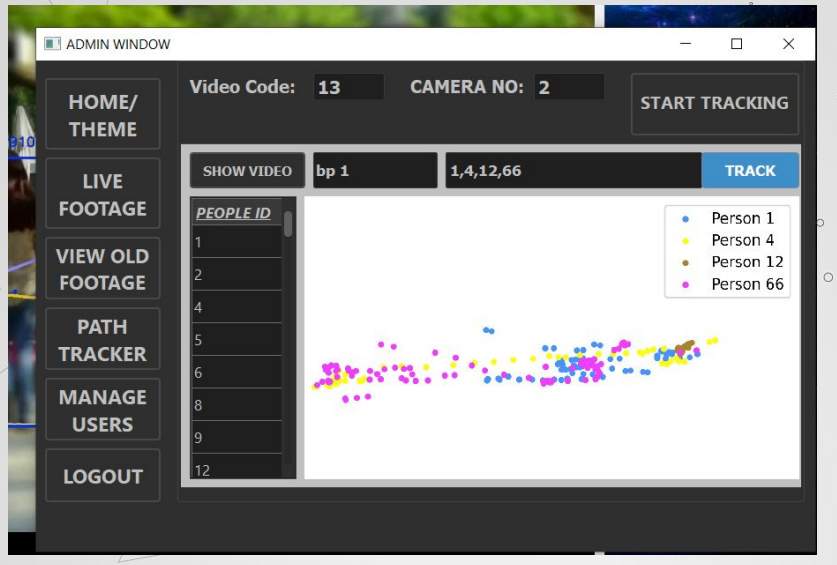
HARDWARE

Camera

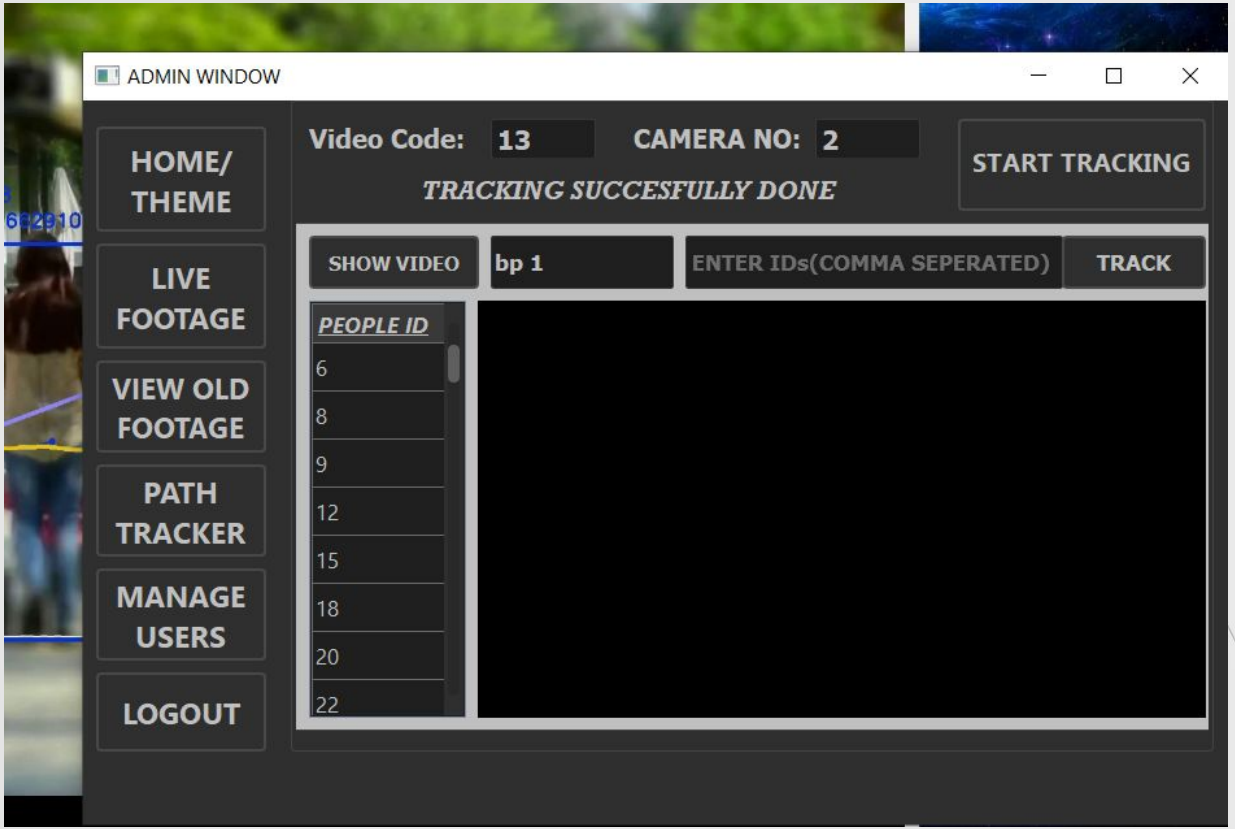
SNAPSHOTS OF PROJECT



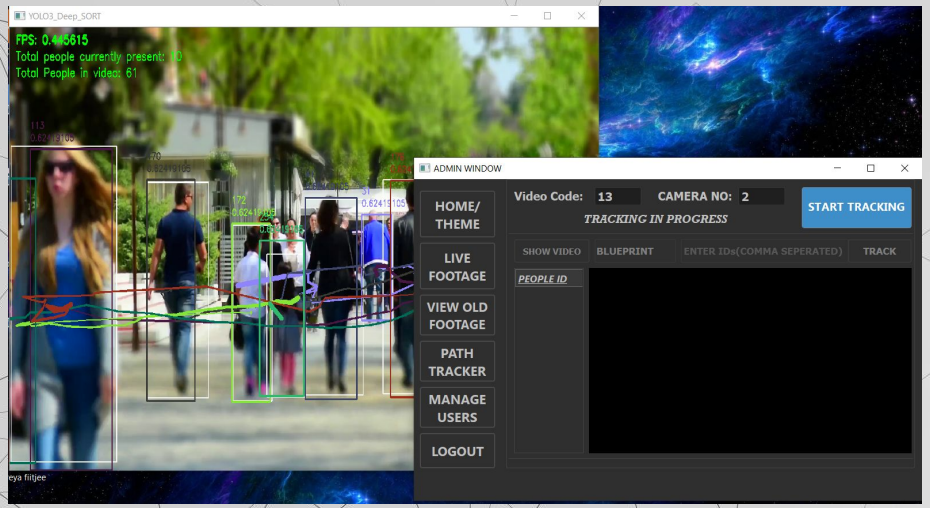
Single Person Tracking

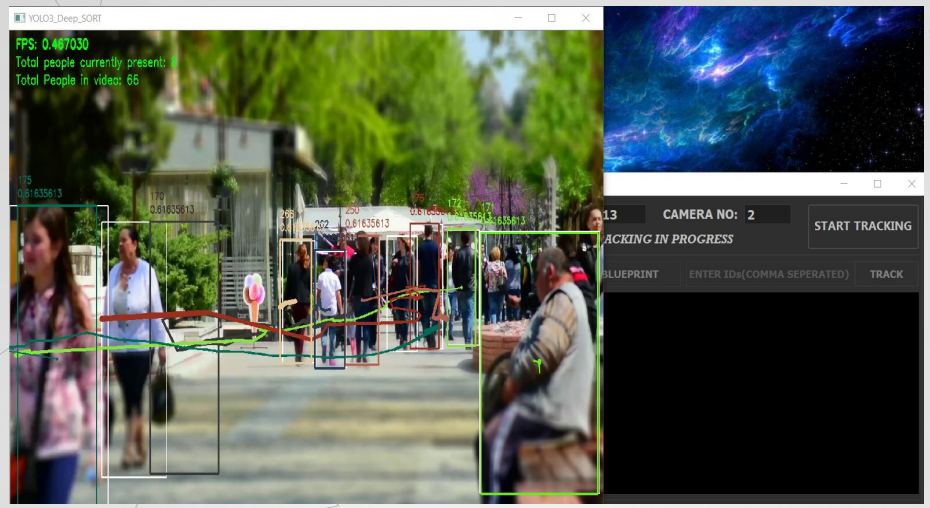


Plotting track of Multiple People



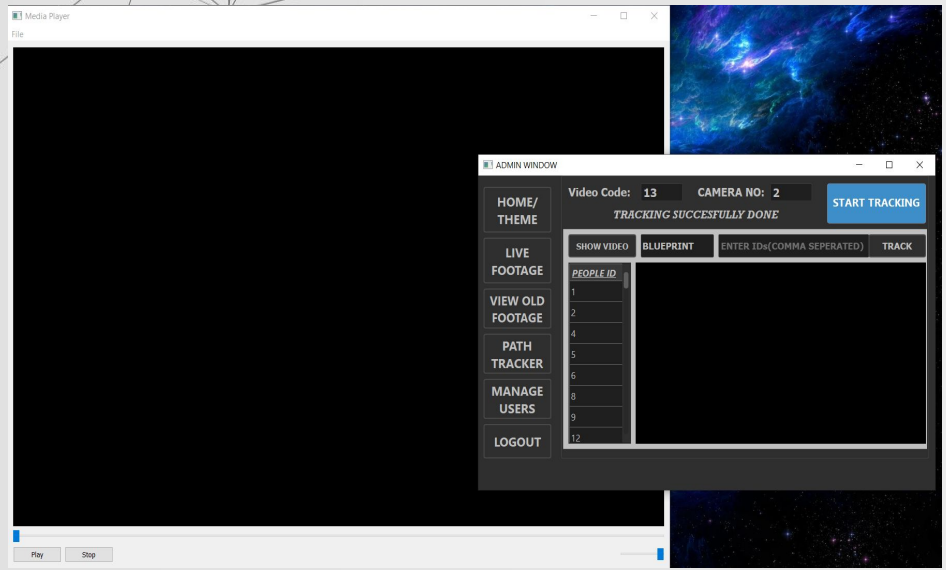
Tracking Id and Blueprint Selection

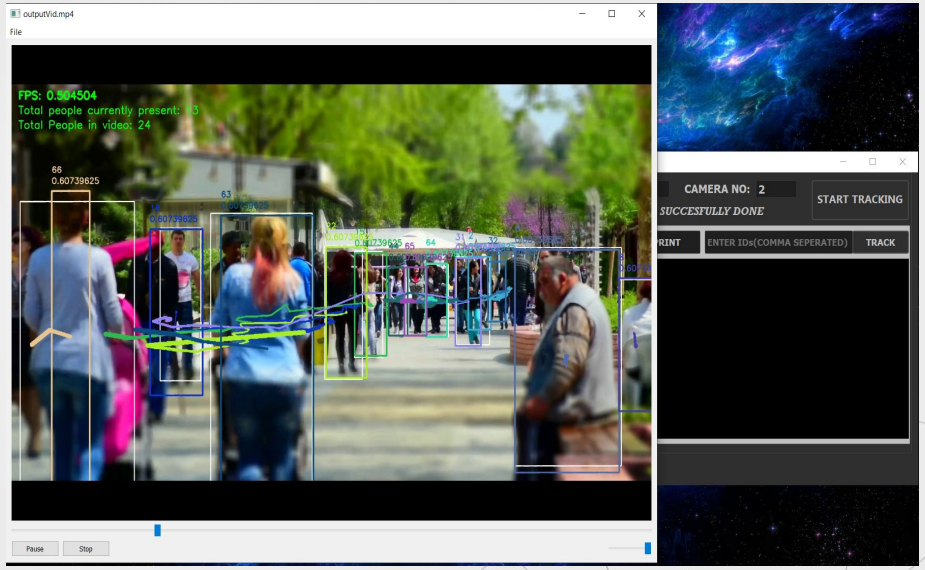




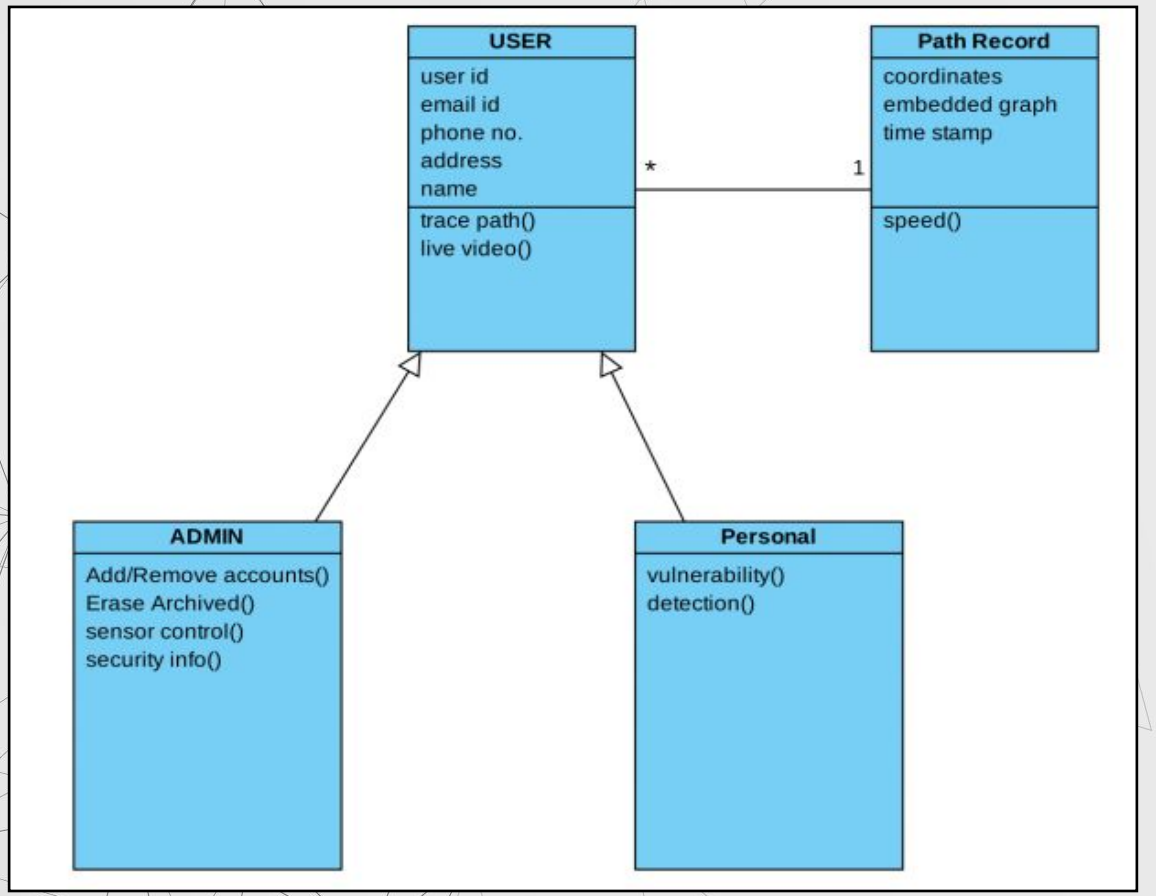
Video Processing

Video Processing Done

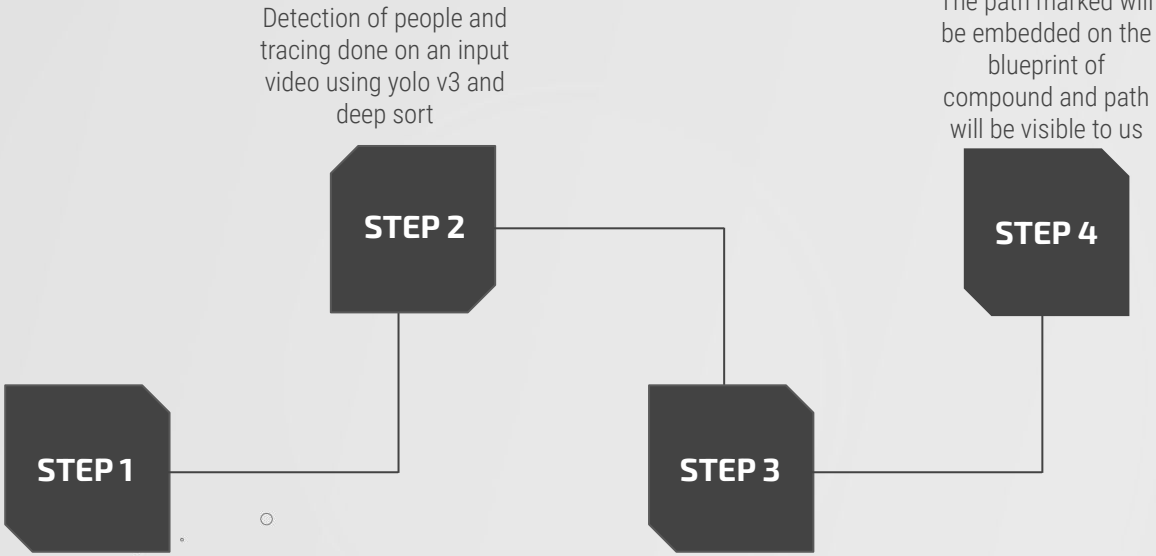




DESIGN INTERFACE



PROPOSED SOLUTION



Video Recording from the cameras will be stored in local server along with snapshots of each timeframe.

Detection of people and tracing done on an input video using yolo v3 and deep sort

A single person will be detected using multiple cameras in order to get his/her path

The path marked will be embedded on the blueprint of compound and path will be visible to us

DELIVERABLES

Path Tracing

Real time human path tracing and also detect the total number of people present in a particular time frame

Time Effective

Will reduce effort hours for finding the person

Cost Effective

A cost effective solution to surveillance

User Friendly

User friendly GUI that analyzes and showcases you the result directly.

Professional And Technical Learning

01

We Learned about Python GUI

02

We got an opportunity to learn different machine learning algorithms and model training

03

We also learned about analyzing different types of videos and about CNN and object detection.

04

Got an idea about different types of hardware used in surveillance systems

05

We learnt about RNN, classification and regression.

06

Learnt about the writing skills for technical reports and emails.

INDIVIDUAL ROLES

Aditya Thakur

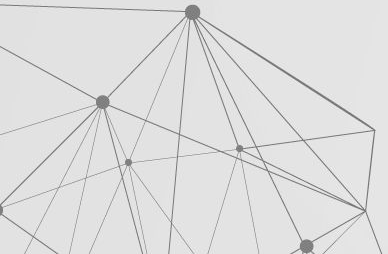
- Creation and Integration of Path Tracking Module
- UML Diagrams and Poster

Aditya Vashista

- GUI and Testing
- Creation and Integration of Path Tracking Module

Akriti Sehgal

- GUI
- Research and Documentation
- Testing



LEARNING OUTCOMES

- Was able to analyse and breakdown problems into manageable steps and understand use of different libraries
- Able to select appropriate computer technologies and techniques for a given situation
- Was able to integrate previous and current learning and use it to solve technology based projects