Human Detection and Tracking

Anubhav Paras, Sakshi Kakde, Siddharth Telang

Overview:

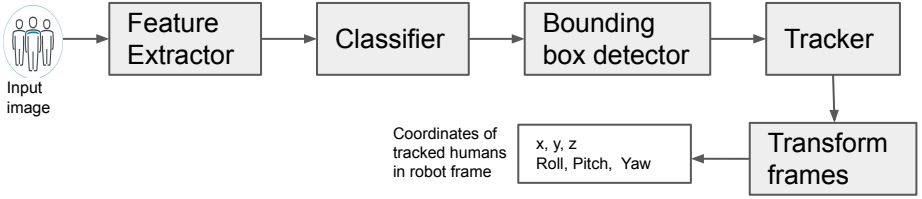
- Design a module to **detect** and **track** humans in a video/image feed from a monocular camera.
- Critical **safety** feature to avoid collision with humans during the work process to prevent to any harm, damage or loss of life.
- Designed for **Acme** mobile robots that work under human dense environment.
- Output will be the **coordinates** of tracked humans along with the **ID**.

Methodology:

- **A**gile **I**terative **P**rocess
- Language : C++ 14 or above.
- Test driven development.
- Unit testing using Google Tests and Google Mocks.
- **Travis-CI** for continuous integration, **Coveralls** for code coverage, **Valgrind** to check memory leaks and profiling.
- **OpenCV**, a real time computer vision library.

Algorithm:

- Feature Extractor : **H**istogram of **O**riented **G**radients
- Classifier : **S**upport **V**ector **M**achine
- Bounding box detector : **I**ntersection **O**ver **U**nion
- Tracker : Centroid Tracking algorithm



Expectations:

Timeline	
Initial setup and project backlog	10/05/2021
UML diagram and stub creation	10/05/2021
Design Unit tests	10/15/2021
Class implementation	10/18/2021
Verify algorithm	10/22/2021

Results
Tracking of multiple humans using a monocular camera
Output ID and coordinates of the tracked humans in robot frame