

# Obstacle Detection and avoidance for UAV

Our Task is To Avoid Obstacle in front of our drone with Minimum Computation and High FPs using Stereo Vision Camera .

# ABSTRACT OF WHAT WE DID :

- > Object search in small projections, Rather than full frame.
- > Disparity Based on ORB pixel-Matching.
- > Avoiding Objects Based on Distance calculated

# FLOWCHART OF OUR ALGORITHM.

## OUR APPROACH

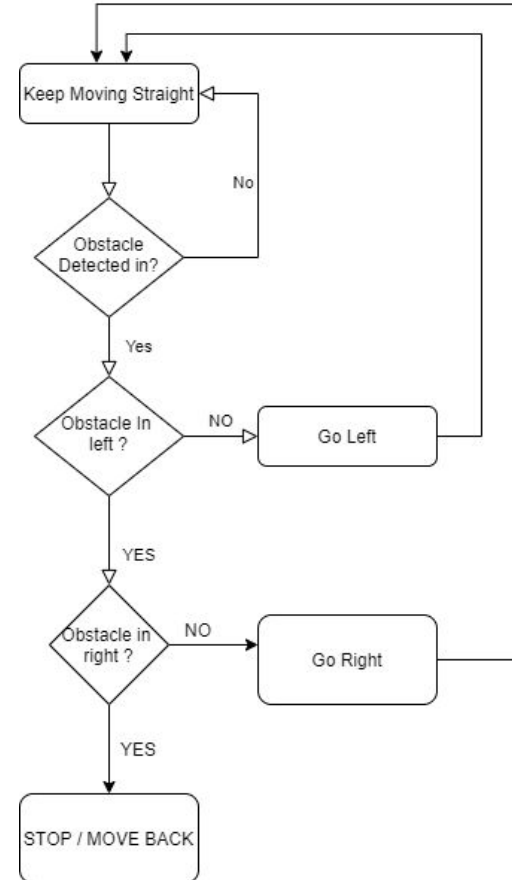
### Projecting Drone on the Image it captures.

First, we need to Project Drone on the Image it captures.

**Centre Projection** is the Projection of Drone on the Image. It corresponds to the front of the drone projection. Any object in this projection lies in front of the drone.

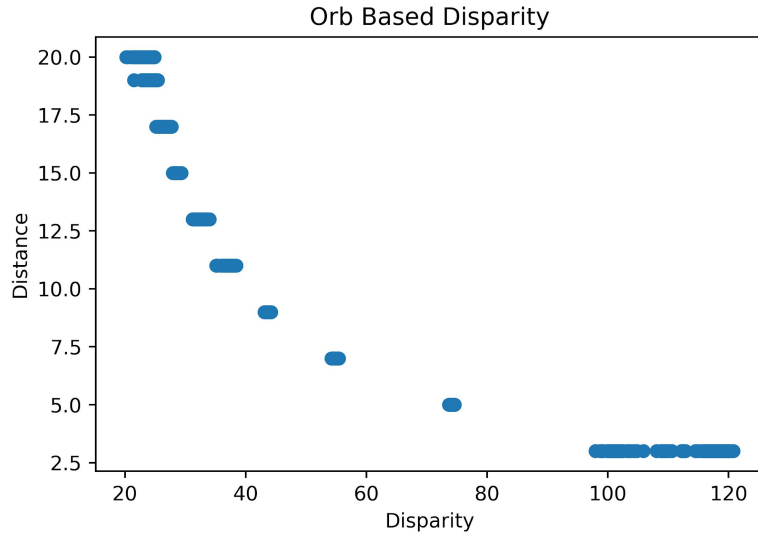
**Left Projection** is the Projection of Drone on the image left to the Centre Projection. Any object in this projection appears to be on the left side of our drone.

**Right Projection** is the projection of Drone on the image right to the Centre Projection. Any object in this projection appears to be on the right side of our drone.

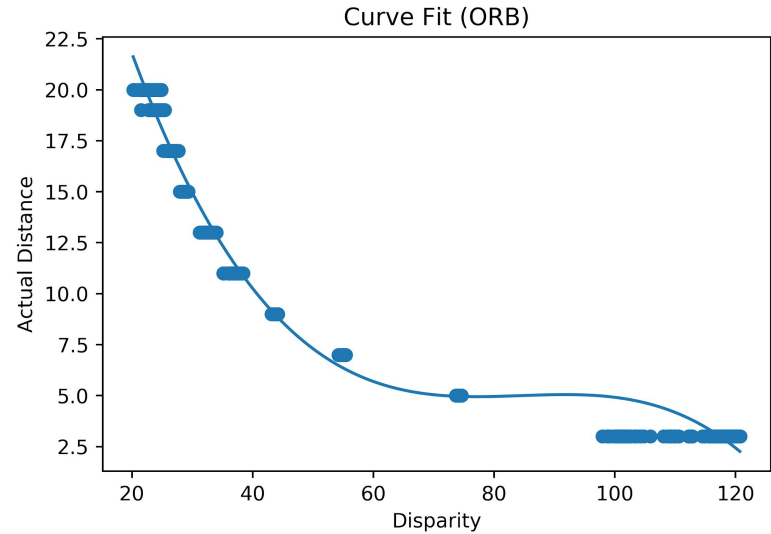


# EXPERIMENTS AND RESULTS

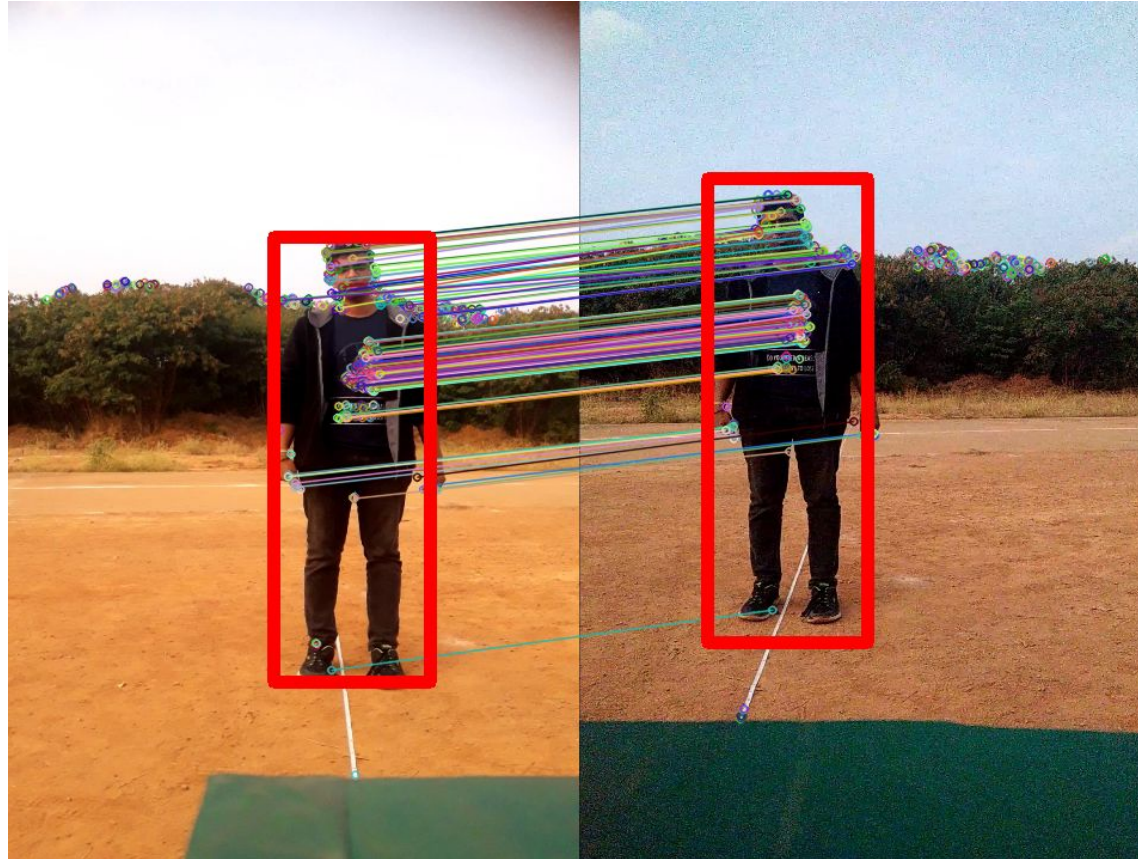
Graph of Disparity(pixel shifts of descriptors) v/s Actual Distance.



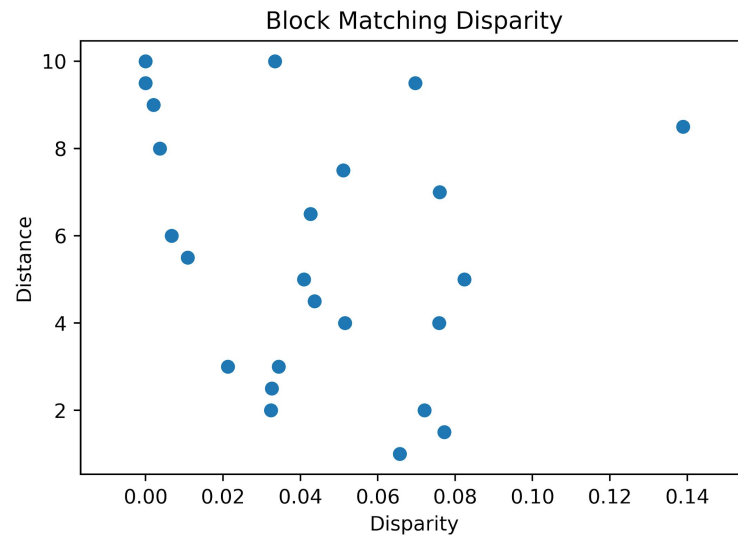
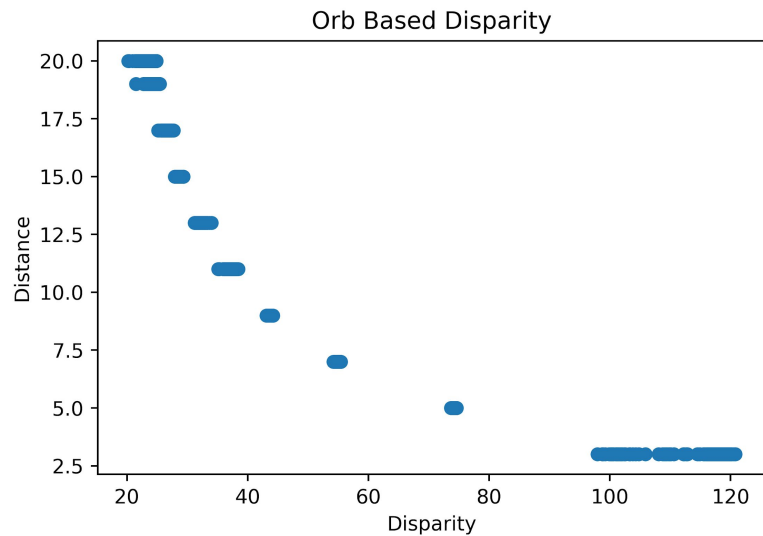
Curve fitting



## ORB FEATURES MATCHING ON LEFT AND RIGHT FRAME



## COMPARISON B/W OUR ALGORITHM AND DISPARITY MAP ON OUR DATASET



# REFERENCES

For ORB :

<https://medium.com/analytics-vidhya/introduction-to-orb-oriented-fast-and-rotated-brief-4220e8ec40cf>

FOR PROJECTIONS:

<https://www.pyimagesearch.com/2015/01/19/find-distance-camera-objectmarker-using-python-opencv/>