



# Construction of Ego-model

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## Introduction

A robotic arm which has a fixed camera at the top, sees the world and generate 2-D images. It can see itself, obstacles and other robots.

## Why important??

- Robot Motion planning
- Reactive Avoidance
- Positioning
- Unmanned exploration
- Military applications
- Factories

## Existing Technology

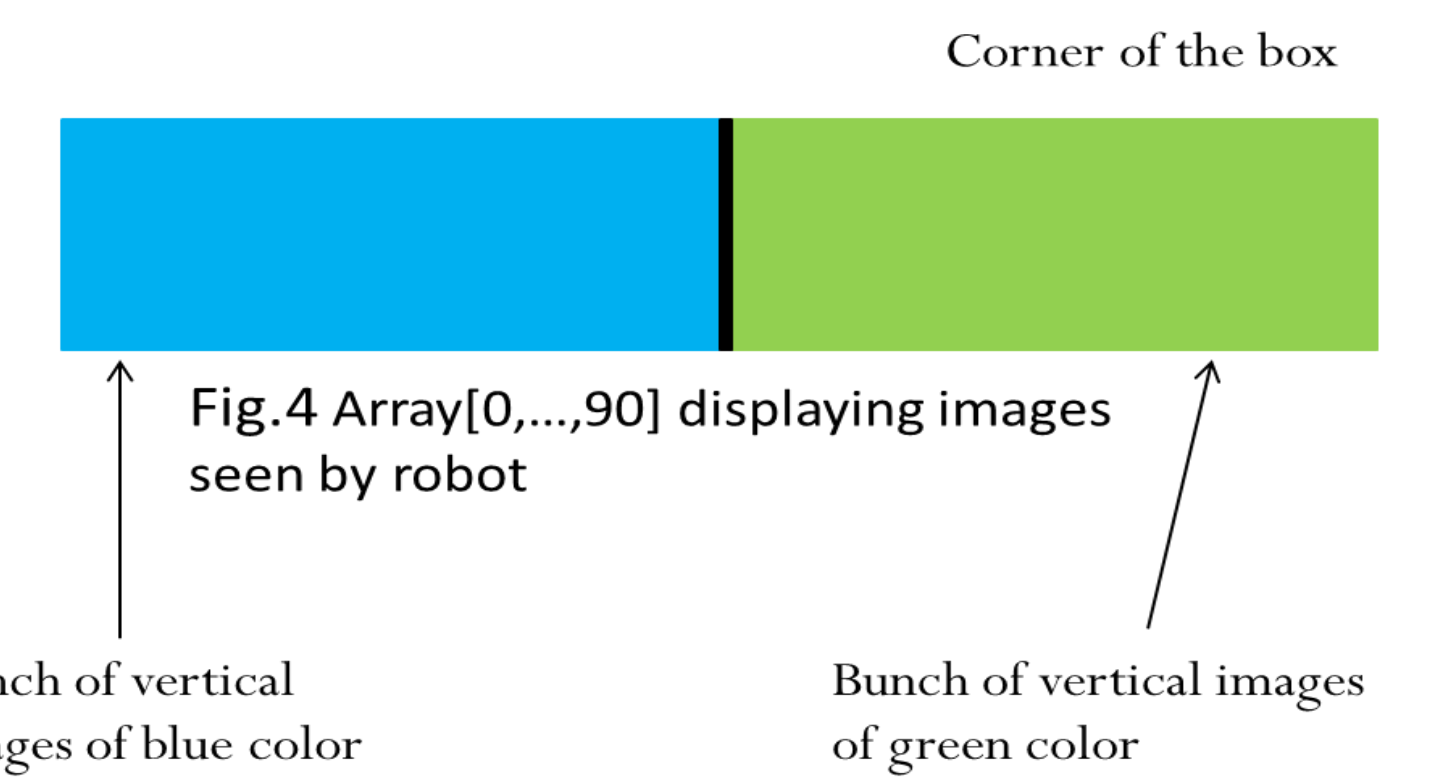
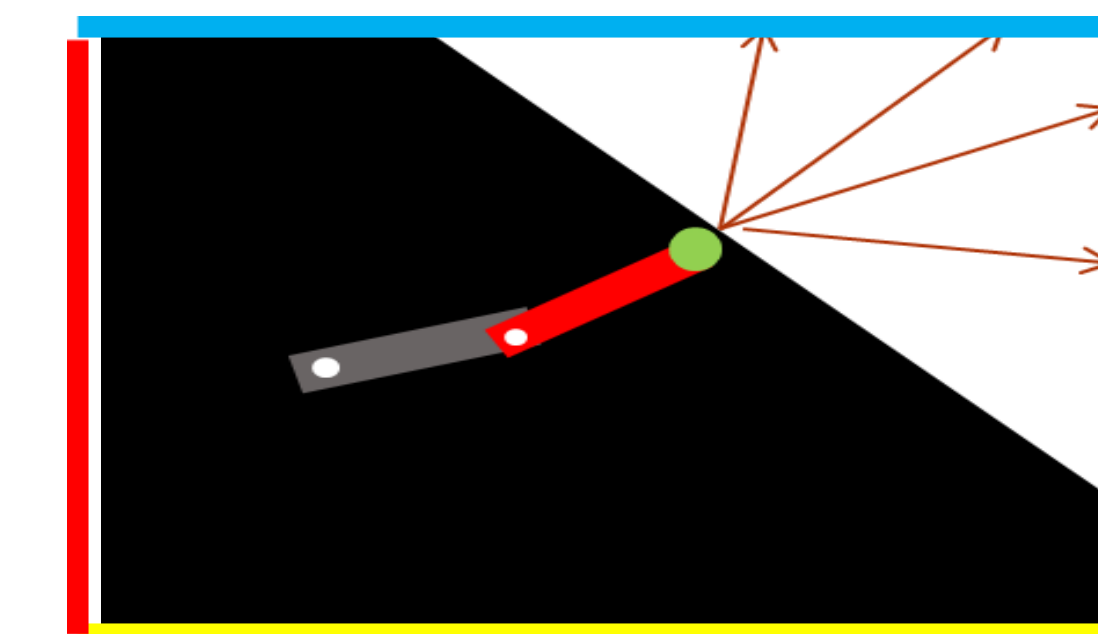
- Single Color Sensor
- Multi Color sensor with discrete outputs
- Rover Robots on Mars and Moon



Source--<http://www.space.com/19883-mars-rover-curiosity-drilling-photos.html>

## Approach & Algorithm

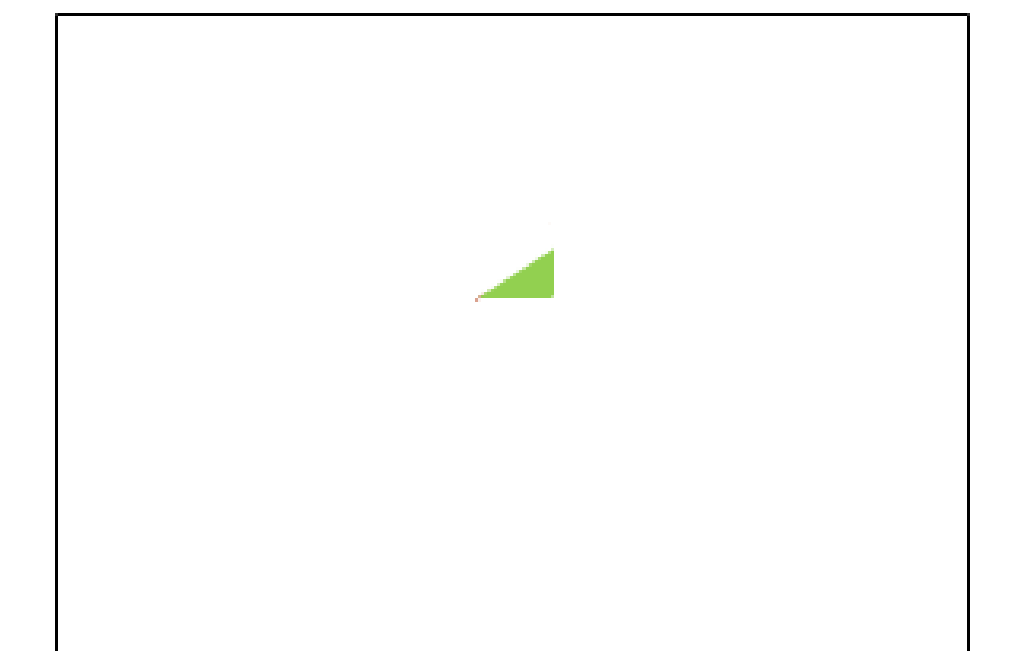
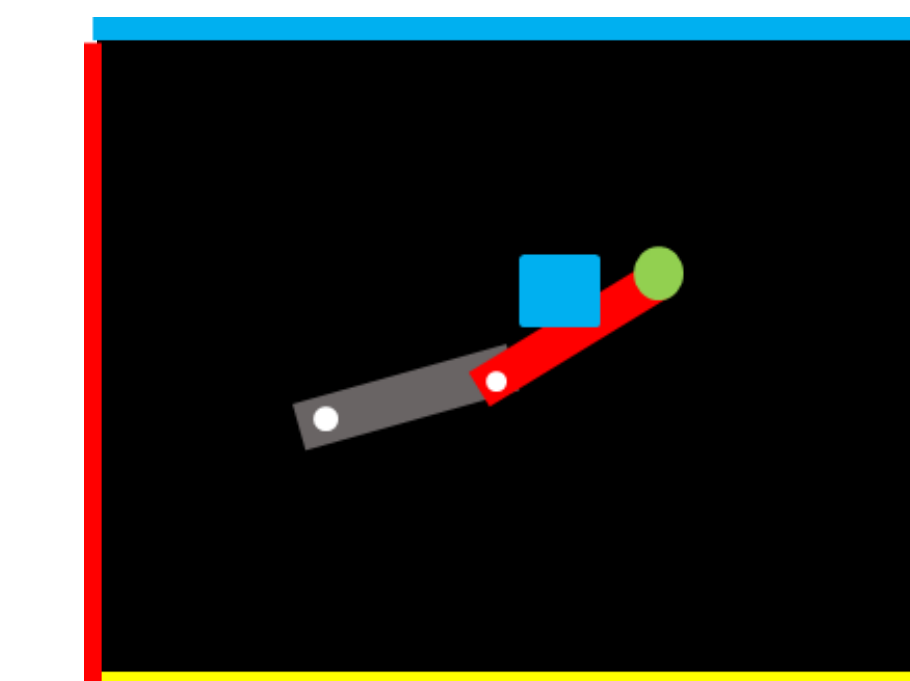
### Objective



### Sensor Algorithm

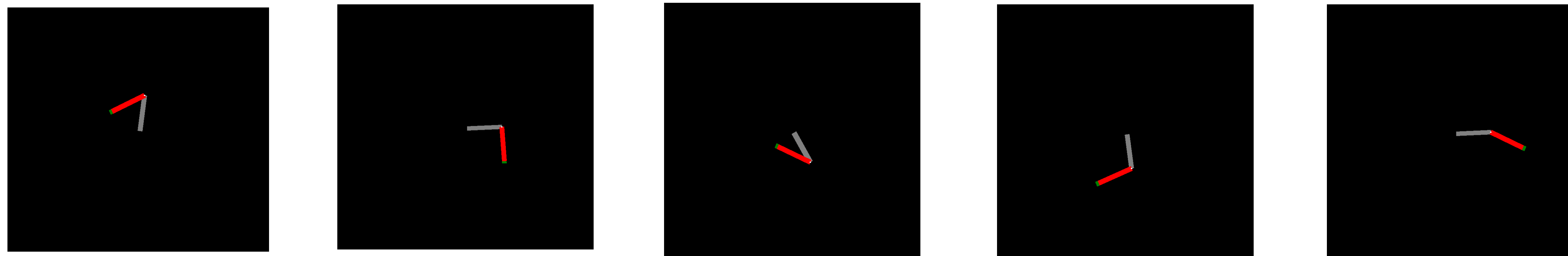
- Overlap the robot arm images with the obstacle call it "A".
- Apply following to get :
 

```
if (robot arm image == (A - obstacle image))
    print "Obstacle doesn't hit the robot"
else
    display the part hit by obstacle
```

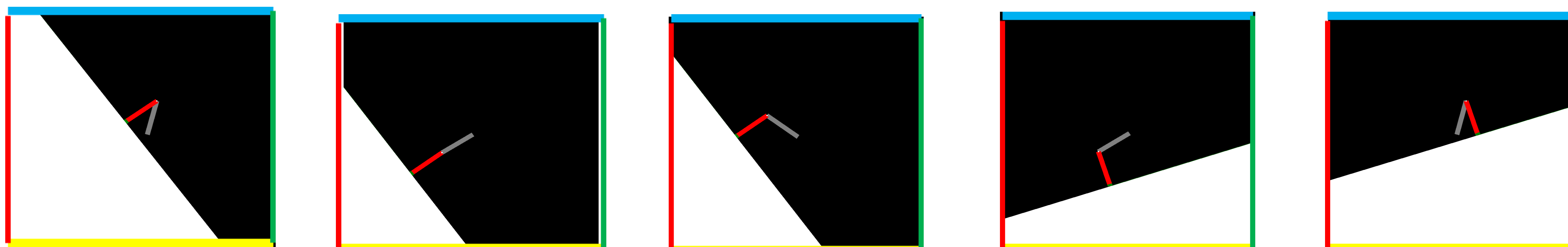


## My Contributions

### ➤ Generated the data set (3000 random out of 21600 images)

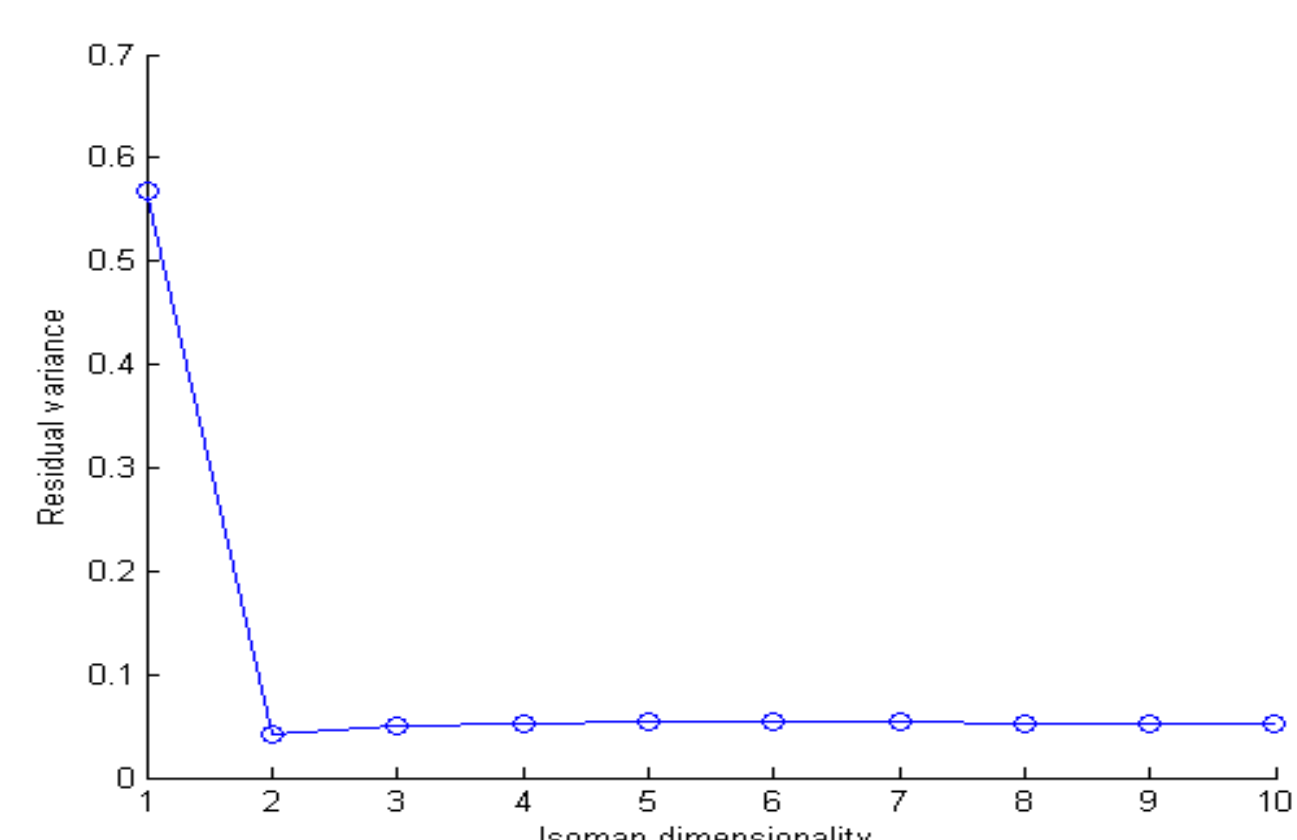


### ➤ Area of Vision of the robot (3000 out of 21600 images)

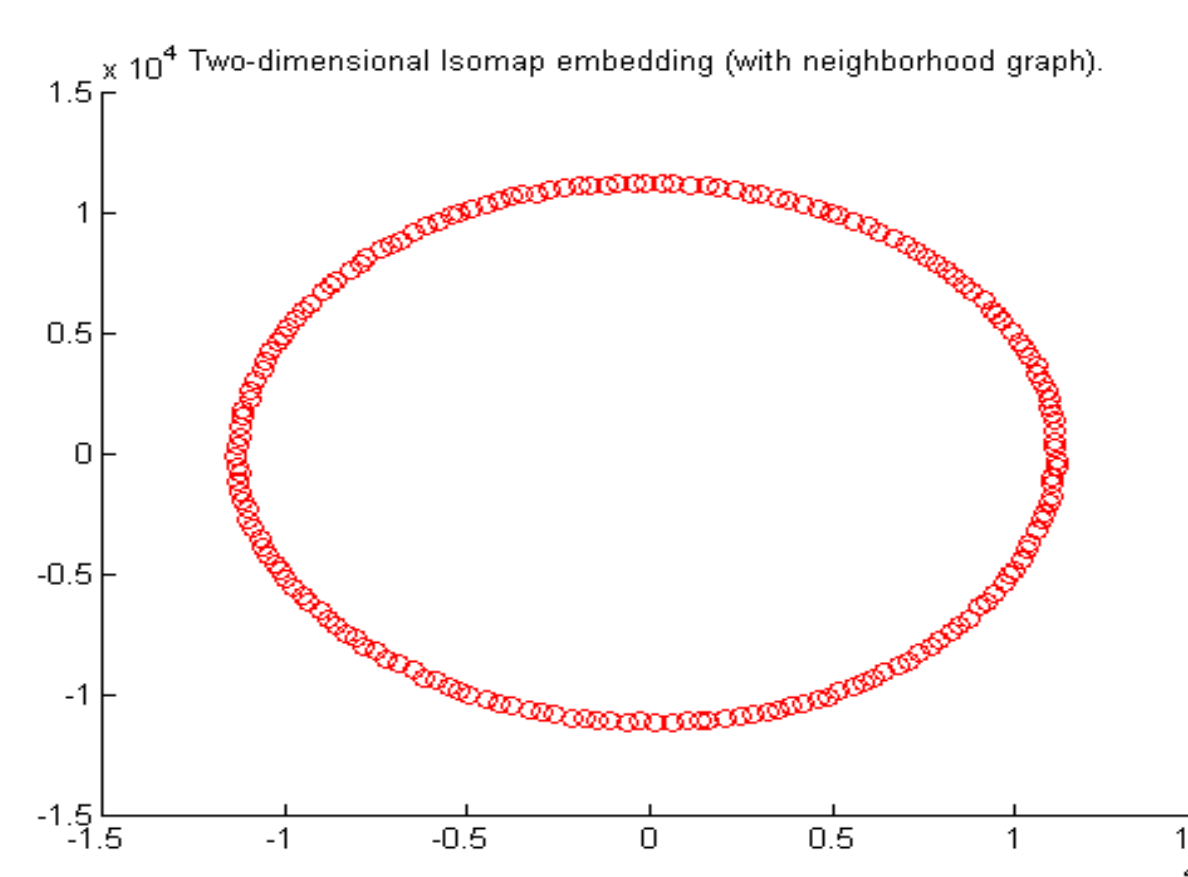


## Results And Analysis

### 1. Scree plot for the robot arm is



### 2. Topology will look like :



## Future Work

- Path Planning with detection of type of object
- 2-D Analysis extended to 3-D Analysis
- Add another robot which shake hand
- Collaborative work of robots
- Use of vision to throw a ball to the wall