Depth Detectic
Based Obstacl
Avoidance

Group 19

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Basic Idea

Given an Arena with objects placed in a random manner

- The Robot scans the area to determines the position of the objects.
- Creates a 3D model of the area with the objects.
- Takes precise action to navigate through the obstacles.

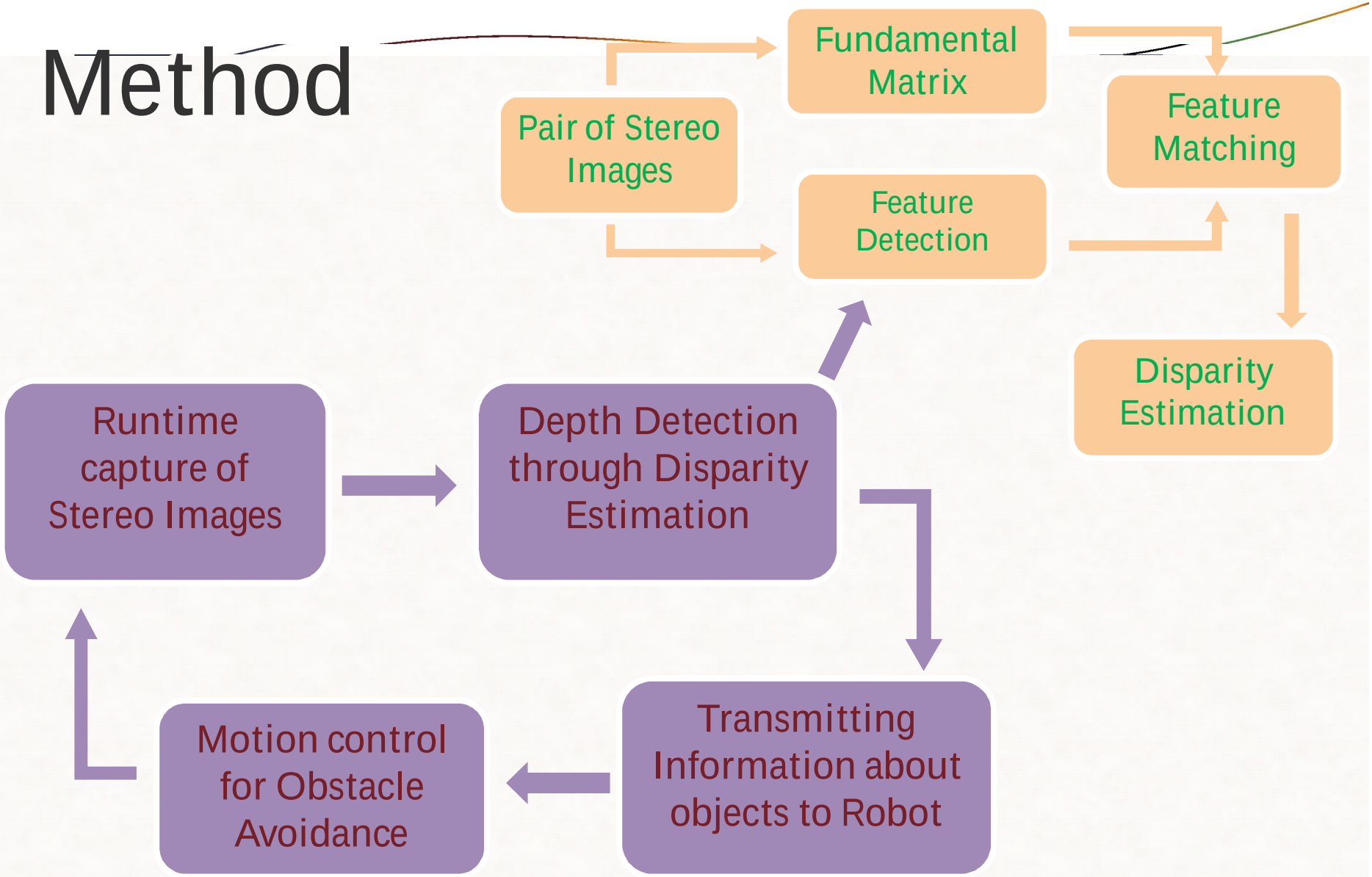
The implementation has three main components :

(i) A stereo vision algorithm for object detection,

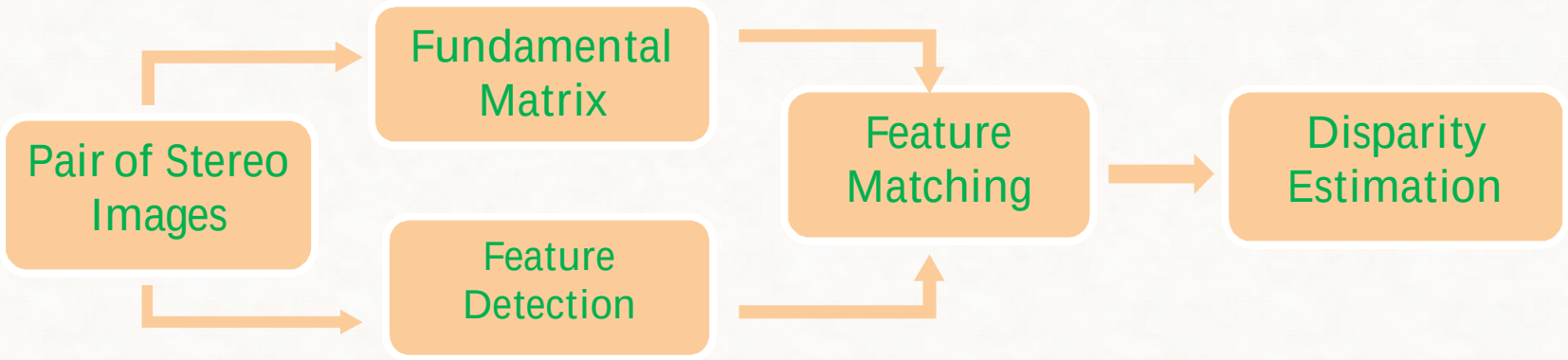
(ii) Construction of a 3D model of the area,

(iii) Navigation using Visual Servoing mechanism.

Method

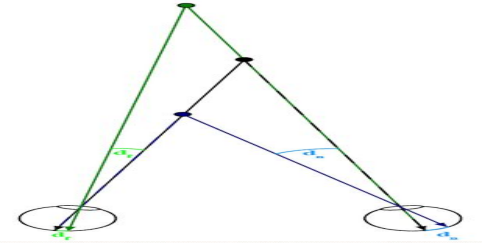

Fundamental Matrix
Pair of Stereo Images
Feature Matching
Feature Detection
Disparity Estimation
Runtime capture of Stereo Images
Depth Detection through Disparity Estimation
Transmitting Information about objects to Robot
Motion control for Obstacle Avoidance

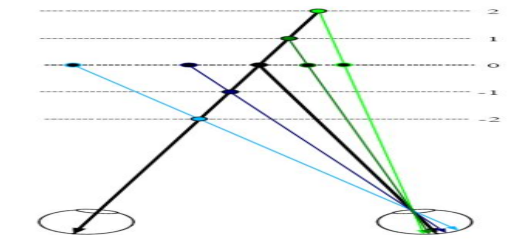
Disparity Estimation Model



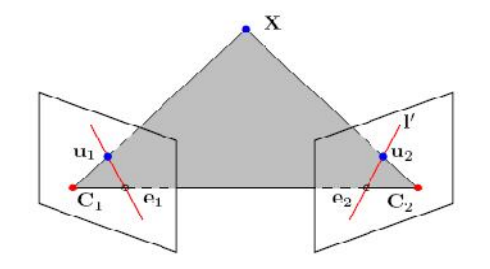
What is Depth

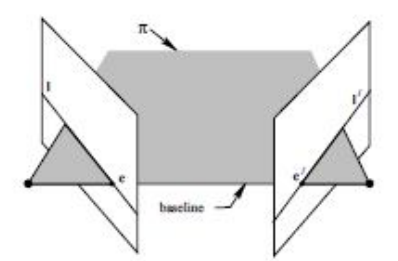
- Human Perception:



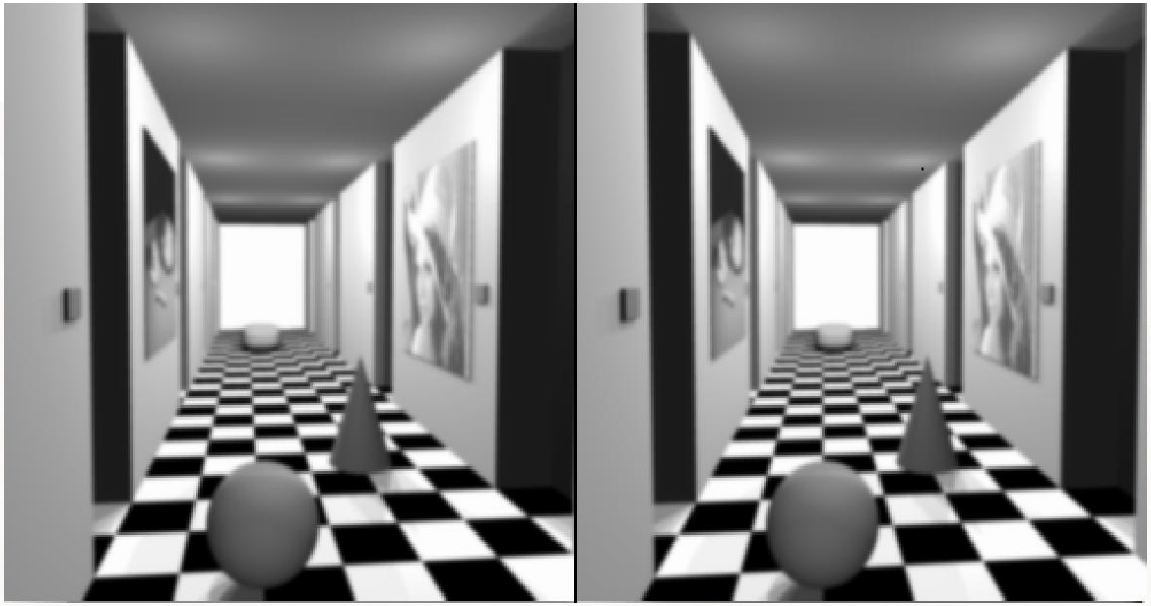


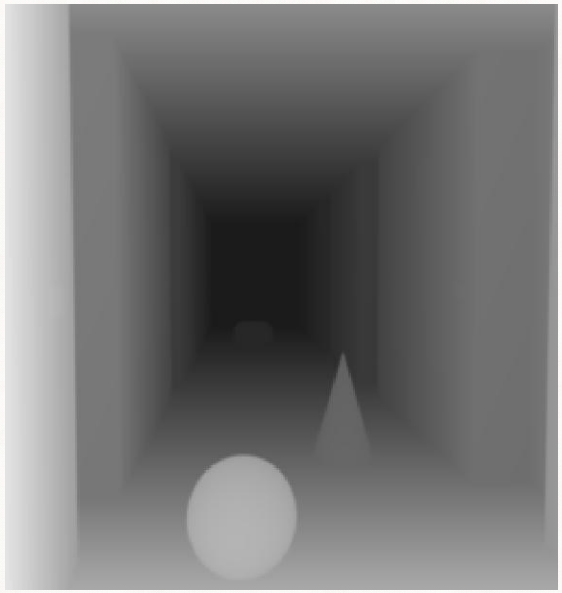
- Disparity Estimation using Epopolar Geometry

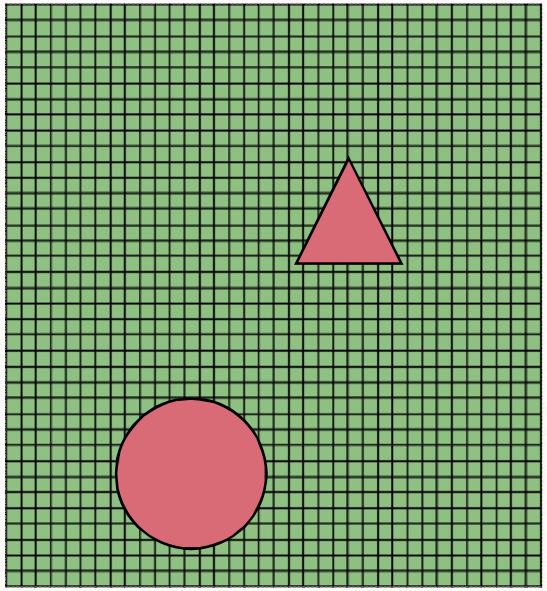




- Distance mapping from Depth map







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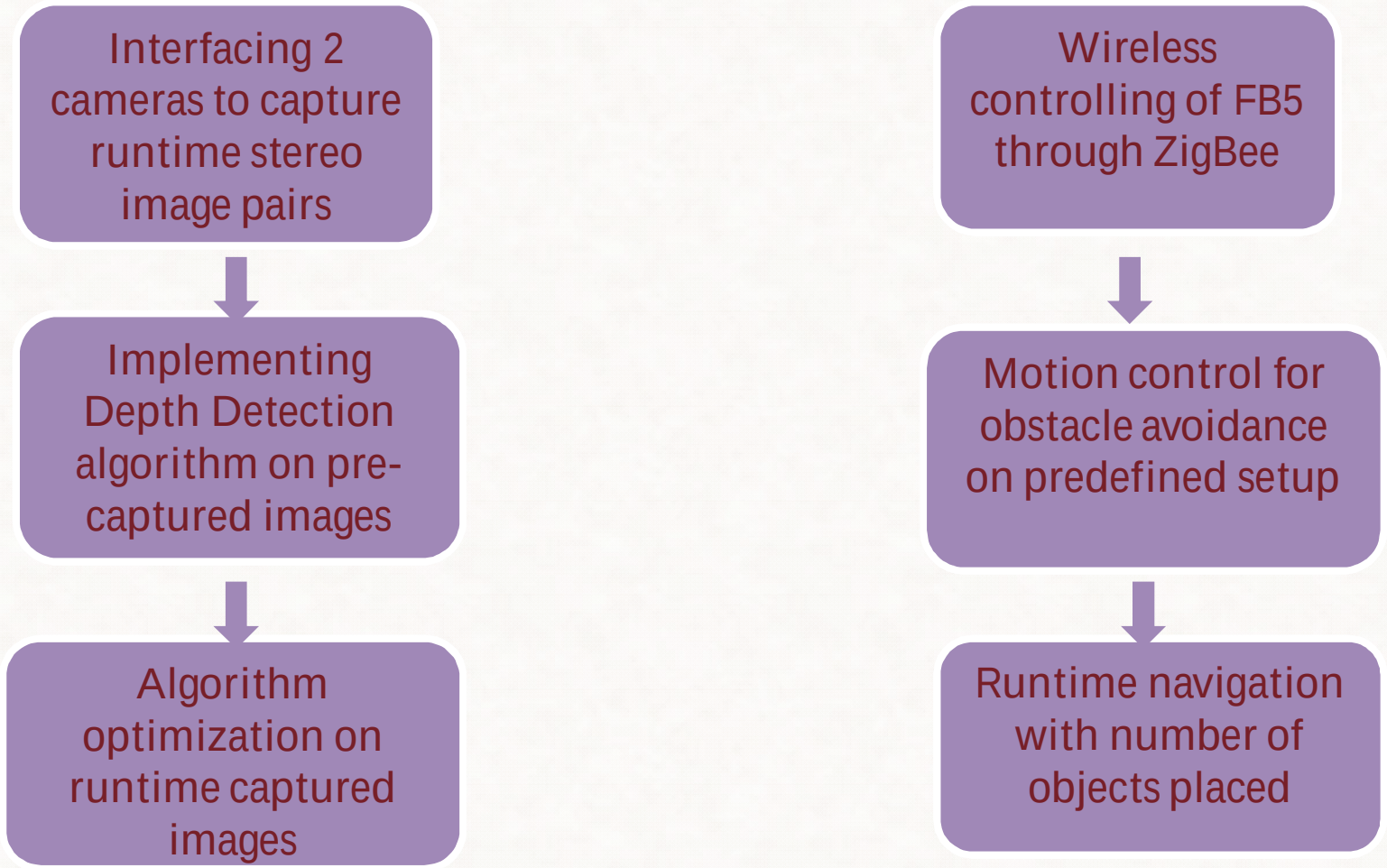
Work Schedule




Thank You