Progress Presentation-I

e-Yantra Summer Internship-2018

A System for Solving Jigsaw Puzzle using Multiple Robots

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Overview of Project

Give following details:

- Project Name: A System for Solving Jigsaw Puzzle using Multiple Robots
- Objective
  - To develop an autonomous system that can solve any Jigsaw Puzzle given its image using multiple robots.
- Deliverables
  1. Go-to-Goal controller for robot in a given frame
  2. Autonomous solving of any Jigsaw Puzzle given just its image
  3. Proper documentation and report on the system.

Overview of Task

Task No.	**Task**	**Deadline** (in Days)
1	Python, OpenCV, Firebird V Intro, Xbee Communication	3
2	Pose and orientation calculation of 2 Firebird robots using color/Aruco markers	4
3	Programming the Go-To-Goal Controller for single Firebird V robot. Tuning the PID values to perfection	4
4	Implementing path planning with Firebird V where obstacles have been placed in arena	3
5	Detection of jigsaw puzzle blocks using Template Matching	2
6	Pick and place of blocks - gripper mechanism building	4
7	Implementing the entire solution for a given jigsaw puzzle	5
8	Documentation and reporting results	4

Task Accomplished

- Established communication between the laptop and the robot using XBee.
- Found the pose and orientation of the robot using ArUco markers.
- Developed a Go-To-Goal controller for multiple robots.

Challenges Faced

- Determining the angle of ArUco Marker in the frame with proper resolution.
- Creating data packets to hold the information about robot(its orientation, position, etc...) and parsing it once recieved by the robot.

Future Plans

- Path Planning of Robot.
- Designing and building Gripper Mechanism to pick and place Jigsaw blocks and implement the entire solution.
- Solve a Multi-Robot Cooperative Box-pushing problem.

Thank You

THANK YOU !!!