

Progress Presentation-I

e-Yantra Summer Internship-2018

A System for Solving Jigsaw Puzzle using Multiple Robots

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Overview of Project

- 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

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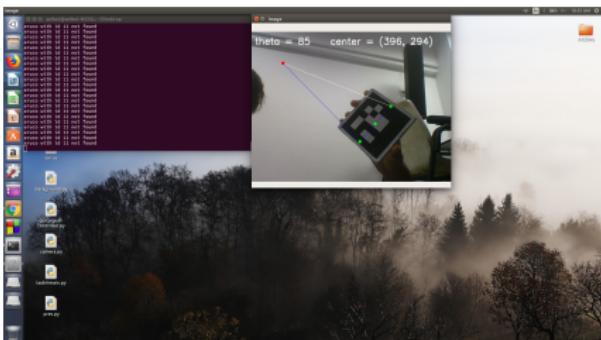
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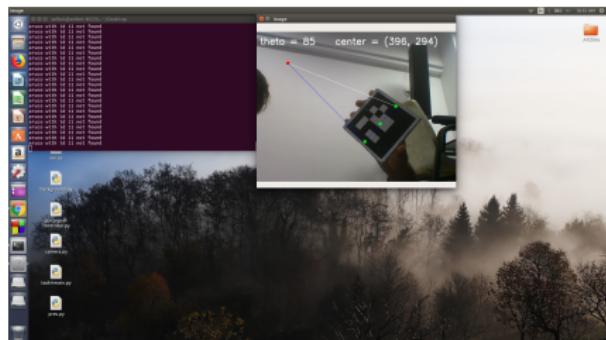
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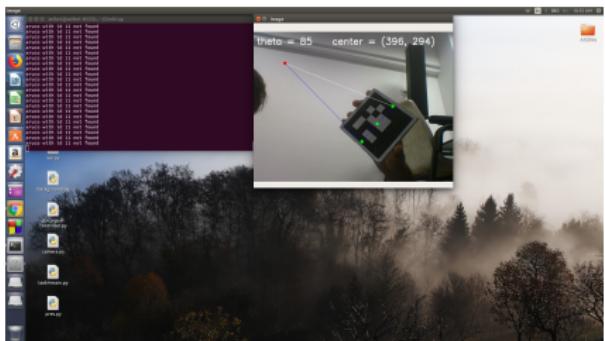
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<T901200|P200|0|0|R90|199|132|120|A|B|S|>
```

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<T tar_x|tar_y|P kp|ki|kd|R head_x|head_y|tail_x|tail_y|A deg|>
```

The data packet is formed by the following values

$< T \text{ tar}_x|\text{tar}_y|P \text{ kp}|k\text{i}|k\text{d}|R \text{ head}_x|\text{head}_y|\text{tail}_x|\text{tail}_y|A \text{ deg}| >$

Overview of Project

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Overview of Task

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Task Accomplished

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Videos

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Challenges Faced

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Future Plans

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Thank You

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Demo



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- Determining the angle of ArUco Marker in the frame with proper resolution.

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- Finding the right library for serial communication
- Understanding the parameters of Xbee('MY')
- Creating data packets to hold the information about robot(its orientation, position, etc...) and parsing it once received by the robot.

Future Plans

- Path Planning of Robot.

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- Designing and building Gripper Mechanism to pick and place puzzle pieces and implementing the entire solution.
- Solve a Multi-Robot Cooperative Box-pushing problem.

Thank You

THANK YOU !!!