Progress Presentation-I

e-Yantra Summer Internship-2018

A System for Solving Jigsaw Puzzle using Multiple Robots

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Overview of Project

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- A System for Solving Jigsaw Puzzle using Multiple Robots
- Objective: The prime motive of this project is to develop a multi Robot based Puzzle Solver system that can solve a Jigsaw puzzle.
- Deliverables :
  1. Solving any Jigsaw puzzle (building a complete solution)
  2. Maintaining Wiki on GitHub for each day progress
  3. Documentation (Software/Hardware)

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

- Task no.1(Python, OpenCV, Firebird V, Xbee Communication)
  - Python and Python libraries (pyserial, xbee)
  - Xbee configuration and communication in XCTU
- Task no.2 Robot pose and orientation using Aruco marker
- Cropping the arena of interest(using Aruco markers)
- Task no.3 Go-To-Goal Controller and PID tuning
- Task no.5 template matching

Challenges Faced

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- finding the right angle(slope) with math library(python,c)
- finding the right library for serial communication(serial,pyserial,xbee,digi-xbee)
- understanding parameters of Xbee ('MY')
- LCD printing the data received on FireBird V

Future Plans

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- An interface for Point-And-Go controller for FireBird V
- Two robots collaborating to take a single box to its destination

Thank You

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THANK YOU !!!