Sixth Sense Robotics

ROBOTECH LABS

PVT. LTD.

The workshop is a secure platform for students to enter into the field of robotics and work on image processing .The workshop helps the students to learn all the basics and apply them in reality using our kits.
The workshop helps the students to fight all the competitions related to robotics , Image processing , Aerial Robotics etc.
The workshop would taken up by the people in the industry having immense experience at the international level in the field Image Processing .

The details of the workshop are as follows:

Topics to be covered

SESSION 1

Introduction to Computer vision:

The journey in to vision robotics will start from basic discussion on vision sensors and different cameras available. We will explore the application of vision in robotics and mechatronic systems.

Digital Image Processing in Matlab:

We will start from the basics of Matlab and after that only we will explore the Image Acquisition and Image Processing toolboxes. Image Acquisition and Processing: Here we will discuss the data structure of image acquired. The understanding for Pixels, color spaces, vector indexing and matrix indexing will be developed in this module.

Image Manipulation in Matlab:

We will deal with Adjusting image intensity, Image histogram equalization , Using arithmetic functions to enhance images, Thresholding, Edge Detection, Template matching, Distinguishing colors, Shape Detection, frequency domain filtering and convolution.

SESSION 2

Microcontroller Programming & Machine Control:

The final aim is to build various vision based machines.

Robots that will be covered on this day include (apart from discussing any ideas from the participants)

1. Ball Following Robot
2. Line Following Robot
3. Reach The Goal

SESSION 2 Sub topics

MOTOR DRIVERS

- Relays-Transistor Motor Driver
- Motor Driving using Darlington Transistors (ULN Devices)
- H-Bridge Motor Driver
- Detailed working of L293D

MICRO-CONTROLLERS AND its APPLICATIONS

- Functioning & Description of the Microcontroller Board
- Interfacing With Computer

COMPONENT INTERFACING

- Data Communication
- Camera Interfacing

MICRO-CONTROLLER PROGRAMMING

- Algorithm Developing
- Writing sample codes
- Writing codes for the bots to be discussed

OTHERS

Simulation for Overhead Based Camera

HANDS ON SESSION

1. Ball Following Robot
2. Line Following Robot
3. Reach The Goal

- Assembeling the Kit
- Writing the codes
- Burning the codes
- Finally Run the Bot
- Go for Competition.

DURATION

We conduct workshops on two consecutive days. Each day has an eight hours session (in total 16 hours). This is properly divided into theory and hands-on sessions.

In the end we organize a small competition among the participants of the workshop so that they get real feel of competitive environment.

CHARGES

The charges are Rs 1350 per student

The Charges includes:

- Training fee of the 2 day workshop
- Handouts and training material
- Information CD
- Participation certificate
- Additionally, a detailed manual will also be provided to each participant