

Haptics Robotic Arm

Haptic technology, or haptics, is a tactile feedback technology which takes advantage of the sense of touch by applying forces, vibrations or motions to the user.

Haptic technology has made it possible to investigate how the human sense of touch works by allowing the creation of carefully controlled haptic virtual objects. These objects are used to systematically probe human haptic capabilities.

Robotech Labs workshops are designed keeping in mind the practical implementation of the Technology and students gain from the workshop. The workshop discusses about Advanced robots, Haptic Technology, micro controllers, Programming, Sensors, Actuators and Communication.

The Basic Certified training program will be a 2 days program which will cover the following topics:

Advanced Robotics

- Introduction to Robotics
- Haptic Technology
- Uses and Application
- What is Exoskeleton?

In this session basic idea of robots and robotics is made clear. Participants are introduced to process of building machine/robots.

Haptic Robotic Arm

- How does a Robotic Arm Work ?
- Haptic Glove
- Working of Haptic Robotic Arm

Actuators

- What are actuators ?
- DC Motor Control
- Servo Motor Control

Sensors

- Sensors and how they are used?
- Different types of Sensors
- Haptic Sensors
- Tactile Sensors
- Feedback Mechanism

Microcontrollers and Programming

- Micro Controller and its architecture.
- How to use a controller in a Robotic/Embedded Application?
- Programming a Controller
- Software and programming

The above lecture will build upon the last one and get students acquainted with programming API and students will also be taught to write codes.

Design of Robotic Arm

- Discussing Different Design Criteria for Haptic Robotic Arm

Practical Activities Covered

The activities covered during the workshop:-

- Construction of Robotic Arm
- Making a Haptic Robotic Arm
- Pick and Place Robot using Haptic Technology.

Kit Content: Free Complimentary Kit to a team of four students.

- One Multi Purpose Development Board (Atmega Based) [1Pc]
 - 4 channels of motor control(L293NE), capable of driving 2 dc motors or 1 stepper motor at a time
 - 8 digital input channels for sensor interfacing
 - ADC – with 6 inputs for Transducer interfacing o Onboard Port Connector for In System Programming
 - USB Connectivity for PC /Laptop Interfacing
- One USB Programmer [1 Pc]
- Two Geared Motor [2 Pc]
- Robotic Arm Assembly [1 Set]
- Robotic Arm Suite Assembly [1Set]
- Robotic Arm Base [1 Set]
- One USB Cable [1Pc]
- Sensor Connectors and Cables [4 Pc]
- Batteries 9V [2 Pc]
- Battery Snaps [2 Pc]
- Two Wheels with Grip [2 Pc]
- Two Castor Wheels [2 Pc]
- One Pack of Nut and Bolts [1 Pack]
- One Screw Driver [1Pc]
- One CD Containing All Software and Study Material [1Pc]
- One Atmega IC [1Pc]
- One Motor Driver IC [1Pc]
- Potentiometers [3Pc]