i-RoboTricks

A workshop on i-Robotics

Workshop Duration: **2 days (16 hrs.)**

The duration of this workshop is two consecutive days, with eight hour session each day in a total of sixteen hours properly divided into theory and hands on sessions. At the end of this workshop, a small competition is organized among the participating students and winners are awarded with a certificates

Workshop Level: **Intermediate Level** s

*(*Best suited for all B.Tech/B.E./BCA/BSc Engg. 2nd to final year students)

Workshop Certification: Certified by Robosapiens Technologies Pvt. Ltd.

"It's the time give brain to your Robots. Let them think like us. Robosapiens India comes up with iRobotricks a Workshop on AI Based Robots. "

Two Day workshop Schedule:

Day 1
Session 1 : Basics of Robot Electronics:

- Basic electronic components.
- Fundamental electrical concepts.
- Detailed session on Transistors.
- Motor Drivers
- Sensors
- Op-Amp
- Bread boarding techniques.
- Interfacing of sensors
- Electronics Components related to i-robotics.
- What are Integrated Circuits? Which ICs are commonly used and How?
- Power Supply
- Mechanical System
- Basic Parts of Robotics
- Future of Robotics

Day 1
Session 2 : Introduction to Microcontrollers

This session would deal with the basics of a microcontroller. The focus will be on the AVR series micro controller, ATMega16, which is one of the most powerful and widely used 8 bit micro controllers.

- What is Microcontroller?
- Difference between microcontroller and microprocessor?
- Microcontroller Architecture and interfacing
- How can we use a microcontroller in our own circuits?
- Microcontroller Programming in 'C'
- Writing your First 'C' Program in AVR Studio
- Compilation and debugging
- Loading Compiled 'C' Program on a Microcontroller using Robosapiens 'AVR Loader v1.0 Beta'
- Line following Robot Algorithms
- Edge Avoiding Robot Algorithm
- Obstacle avoider Robot Algorithm

Day 2
Session 3 : Development of a Edge avoiding Robot on i-BOT Robokit

It's a bot which never falls off the edge of a table. It has protruding sensors, which can detect beforehand, what lies ahead, whether it is the table surface or it's end. When it detects an end, it turns taking into consideration the distance between it's wheels and the protruding distance of sensors from the main body of the bot. This results in a mechanism, which turns the robot in the appropriate direction whenever the limit of the table (or any elevated surface for that matter) ends and thus never lets the bot fall off the table.

Day 2
Session 4 : Development of Line Following Robot iBOT Robokit

As the name suggests, it follows a line whose color is in contrast with the rest of the surface. A simple fuzzy logic will do the job of maneuvering the bot through the line in whatever direction it goes (obviously keeping in mind the dimensions and turning limitations of the bot)

Day 2
Session 5 : Development of Light Searching Robot on iBOT Robokit

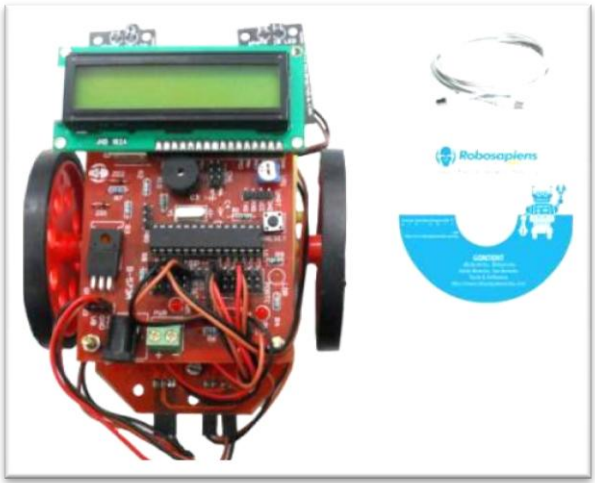
As the name suggests, it follows light beam. A simple fuzzy logic will do the job of maneuvering the bot through a Light searching Sensors in whatever direction it goes (obviously keeping in mind the dimensions and turning limitations of the bot).

Possible Robotics Applications using i-RoboTricks Kit

- Black Line Following Robot using AVR microcontroller
- White Line following Robot AVR microcontroller
- Edge avoider Robot using AVR microcontroller
- light seaching Robot (Photo Tropic) using AVR microcontroller
- Light avoider Robot (Photo Phobic) using AVR microcontroller

Other Applications using Same kit Home automation system

- Object counter
- Digital Clock
- Micromouse
- grid solver robot
- Traffic Light Controller
- Automated Parking system
- home security system



A complete iRobotricks Kit

LCD is Not included in the above Kits

KIT Component for i-RoboTricks workshop

1. The controller board (Robosapiens RBoard)
    - Built around the popular Atmel AVR microcontroller ATmega 8 with ample of program memory (8Kb)
    - 2 channels of motor controller Board, capable of driving 2 dc motors
    - on board power regulator IC
    - On board power supply socket
    - Onboard program RESET switch
    - Atmega8 Microcontroller
    - USB Programmable
    - USB Powered(only for programming)
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2. USB Cable

3. Chassis:
    - Chasis cum Motor Driver Circuit
    - Driven by 2 geared motors and 2 Castor bullet

4. Motors: 2 gears motors(BO-2 Type)
5. A pair of Wheels with rubber
6. Sensors : a Pair of IR Sensor
7. Tool: Screw Driver
8. Software (Soft Copy):
    - Robosapiens BootFlasher
    - AVR ATmel Studio 4
    - WINAVR
    - OK Tested Programming Projects for Line Follower, Edge Avoider, Cell Phone Operated Robot and other Robots
    - Videos of Robots Developed by the given Kit and Programs
    - Datasheet of ICs used in given Robot