AutoBotz on (AVR)

AutoBotz is a microcontroller based introductory autonomous robotics workshop by Technophilia, where you learn the art of making autonomous robots. This workshop teaches you the fundamentals of designing and building autonomous robots by integration with a microcontroller. It also focuses on conceptualization and designing of complex systems and will help clear concepts related to embedded systems, artificial intelligence and automation.

Apart from the theoretical sessions, participants would be working on autonomous robotics kit specially designed by Team Technophilia. This kit includes, microcontroller based board, sensors, actuators etc. Hands on sessions on this kit will help the participants to enhance their embedded C programming and PC hardware interfacing skills.

What will you learn after attending the work shop:-

- Details on microcontroller
- Programming the microcontroller using embedded C
- Interfacing and controlling various devices like keypad, LED, buzzer, motors, sensors etc with microcontroller
- Making serial communication with PC using hyper terminal and UART communication protocol
- Use of ADC for different interface control
- Making of various types of robots their algorithms and coding
- Application of micro controllers and embedded C in industry, military, medical, home appliances, home automation etc

The Robots Can be made using this kit:-

- Line follower robot
- Path memorizing robot
- Grid navigational robot
- Obstacle Avoider and Follower Robot
- Photo Phobic and phototropic Robot
- Fire fighter robot
- **Sound controlled robot**
- Wall Follower robot and many more……

The concepts to be covered are:-

- Types of Autonomous Robots
- Elements of an autonomous robot
- Introduction to BEAM robotics
- Microcontroller based robots
- Pre programmed robots
- Self learning robots

Microcontroller

- Overview of available microcontrollers
- The AVR series of micro controller and its core
- Its features and capabilities

Programming

- Embedded C
- Use of Embedded C IDE
- Use of burner tool
- Writing code in embedded C
- Accessing various functions of micro controller using embedded C
- Implementation of various algorithms in embedded C
- Implementation of artificial intelligence using embedded C

Actuators

- DC Geared motors
- Stepper Motors
- Servo Motors

Motor Drivers

- Electromechanical: Relays
- Solid-state drivers: H-bridge, IC drivers

Sensors

- Light: LDR, photodiodes, phototransistors
- Heat: Thermostats
- Sound: mike, Ultra-Sonics
- Mechanical touch sensors

Power Supplies

- AC adaptor
- Different types of batteries

Duration: 2 days each day 8 hour

The Training kit contents:-

1. Micro controller development board with the following features.

    a. Built with popular AVR micro controller
    b. On board programmer interface (USB/serial)
    c. On board regulated power supply
    d. On board motor driver
    e. On board LED and Buzzer
    f. On board LCD interface
    g. On board serial port
    h. On board input switches

2. Optical sensors (3)
3. **Sound sensor** **(1)**
4. Serial cable /USB cable (1)
5. A set of robotic chassis (1)
6. Geared DC motor (2)
7. Molded plastic Wheels with rubber grip (2)
8. Ball caster with 360 degree freedom (2)
9. Batteries for power supply (2)