WORKSHOP ON MANUAL PICK AND PLACE LIGHT CHASER ROBOT

BeginBOTICS is a workshop which is best suited for beginners in Robotics. This workshop basically deals with designing various kinds of electronic sensors and circuits and using them for making autonomous robots without using a microcontroller. This module would be utilized to familiarize the students with the concepts of designing and building a small robot that is capable of performing multiple tasks such as:

- Manually Controlled robot (designing 4 channel remote controls for any robot and competition)
- Pick and Place Robot
- Light Chaser Robot
- Automatic Path Finding Robot

Topics to be covered

THEORY...

Mechanical Design

- Designing of the Robot Chassis
- Kinematics and Dynamics of Robot
- Pick and Place Gripper Design
Electrical Systems

- Power Supplies (Electrical and Batteries)
- Voltage Regulation
- Switches
- Relays
- Motor Drivers
- Linear Drivers

Actuators

- DC Geared Motors
- Stepper Motors
- Servo Motors
- Brushless DC Geared Motors (BLDC)

Circuit Theory

- Working Principle of Circuit
- Sensing and Controlling

Basic Electronic Components and their Market Analysis

- Integrated Circuits (IC’s): L293D, ULN2003, 555, LM358, LM741, etc.
- Relays
- Using DPDT and SPDT Switches and Relays with their wiring basics
- Diodes (Complete analysis and use in circuit designing)
- Sensors of different categories (IR, LDR, Photo-electric, Piezo sensor, Sound Sensor, Light sensor, Metal sensor, Ultrasonic Sensors, Gas Sensors and many more…)
- Overview of Resistors and Capacitors parameters and company analysis considered for industrial purposes
- Industrial Application of this robot
HANDS ON...

Sensor Technology

- Introduction to different category of sensors
- Selection of Sensors for circuit designing
- Basic circuit testing of Light sensors
- Interfacing Light sensors with comparator IC’s
- Generating Digital logic using sensors

Circuit Designing

- Designing the logic of the required circuit using basic and digital electronics
- Datasheet study and analysis of every IC on breadboard
- Circuit Designing on DIP-TRACE Software
- PCB Designing on DIP-TRACE Software
- Soldering and Assembling of the Designed PCB’s of their robots (No ready-made kit would be provided, students would have to perform the complete designing, soldering and testing process from their own hands under the guidance of our experts)
- Designing of Electrical and Mechanical Gripper for robotic arm
- Designing of remote (4-channel) for moving the bot forward, reverse, lefyt, right and stopping it
- Designing and fabrication of complete robot on Designed PCB’s by every team of students

Testing and Trouble shooting

- Testing and troubleshooting at every step of circuit designing
- Various trouble shooting techniques
- Finding faulty components in the circuit
Software Work (DESIGNING AND SIMULATIONS)

- Every student would be assigned to design his/her PCB on Dip-Trace software with both Manual Routing and Auto-Routing Techniques
- Simulation of the designed model by every student on software Proteus would also be covered along with hardware designing and testing

Why STrobotix?

This workshop will be beneficial for students in following ways:

- Detailed Knowledge of Electronics and Electrical Concepts along with kinematics and Dynamics of Robot
- Hands on session along with theory session step by step
- They learn to choose various components values optimally while designing circuits
- Each and every component’s complete knowledge would be given to every student including the companies, types, values, datasheet analysis, fault finding techniques, etc. so that he/she could be able to make any kind of similar project in future by his own
- Complete software analysis and extra training on PCB Designing and Manufacturing and Circuit Simulation Techniques using softwares such as Dip-Trace, Eagle, Orcad, Proteus, etc.
- We provide them future help and guidance for participating in competitions and these competitions are what makes them skillful and enhance their practical knowledge towards which we are gonna make first step
- Also, workshop doesn’t end up then and there. They can contact the concerned faculties throughout their graduation or thereafter also if they need any guidance regarding Academic Projects and Industrial Trainings in more advanced fields

Previous workshops by STrobotix:
STrobotix have organized aero-modelling workshop in some of the Institutions such as given below and gained a lot of experience in handling and managing the workshop and imparting students with useful tools and knowledge about the Robotics and Aero-modelling field.
Workshop Proposal By STrobotix, Sector-41-b, Chandigarh

- Thapar University, in its national techfest, ARANYA
- First techfest of CCET, Sec-26, CHD, APRATIM 2011
- In GGS-Sachdeva college for women
- In CGC Landran
- In IET Bhaddal, Ropar
- GGI, Khanna
- ACE & ER, Ambala College of Engineering, Mithapur
- Himalayan Group of Institutions, KalaAmb and many more…. to promote this technology.

**Workshop Duration:** 2 days workshop (sat-sun) from 9:30 am to 5:00 pm on both the days (given that timings could be extended to 1 day more in order to complete any student’s Robot’s

**Workshop Fees:** Rs. 3000/- team and 3 students maximum per team are allowed (*i.e. Rs 1000/- per student*) with the complete robotic kit (Including All the components, sensors, Designed PCB’s, Mechanical Structure, Motors and an interactive CD including software’s like keil, Dip-Trace, Proteus, MATLAB and Latest robotics, GSM and Mechanical projects ideas and videos by STrobotix)

**Last Date for Registration:** 10 days before the workshop or when the maximum entries for workshop are attained.

**Want us to give a Demo of the robots and other unique projects in your college:** We are giving demo air shows and robotics exhibitions in various engineering colleges and entries of the interested students are taken on the spot. If you want us to give a demo air show and robots exhibition in your college, contact us on the given numbers.
ACHIEVEMENTS OF STROBOTIX

1) First Position in TECHKRITI 2011, in Cruise Control Event of Aero-modelling
2) First Position in GYAN VIHAR UNIVERSITY, RAJASTHAN for designing of flexible swarm robotics.

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<thead>
<tr>
<th>NAME OF TECHFEST EVENT NAME</th>
<th>POSITION/PRIZE</th>
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<td>3) TECHNIHE’07 at IIT GUWAHATI</td>
<td>“Ghost of chandsyl” Appreciation Certificate</td>
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<td>4) TECHNIHE’07 at IIT GUWAHATI</td>
<td>“Technotennis” Participation</td>
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<td>5) SHAASTRA’07 at IIT MADRAS</td>
<td>“Robotics Workshop” Volunteer</td>
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<td>6) SHAASTRA’08 at IIT MADRAS</td>
<td>Appreciation Certificate from NYU,Singapore on Unique Design</td>
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<td>7) KAMIKAZE’07 at IGIT,Deli</td>
<td>“Terminator” Best Technology</td>
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<td>8) KAMIKAZE’07 at IGIT,Delhi</td>
<td>“Adventures at Augean tables” Participation</td>
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<td>9) Riyaaz’08 at IET Bhaddal</td>
<td>“Robotics Workshop as organizer” Appreciation Certificate</td>
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<td>10) ARANYA’07 at Thapar university</td>
<td>“Applied Mechatronics” 1st position</td>
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<td>11) ISA’05 at IET Bhaddal</td>
<td>“Robotics Workshop” 1st Position</td>
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<td>12) PecFest’07 at PEC</td>
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<td>13) PecFest’08 at PEC</td>
<td>“Line Follower” 2nd Position</td>
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<td>“Golemo Quakes” 2nd Position</td>
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<td>“Design’o’victor” 2nd Position</td>
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<td>16) Techfest’08 at SLIET,Longowal</td>
<td>“Car Racing” 1st Position</td>
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<td>17) Techfest’08 at SLIET,Longowal</td>
<td>“Robowars” 1st Position</td>
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<td>18) Techfest’08 at SLIET,Longowal</td>
<td>“Model Exhibition” 2nd Position</td>
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<td>19) Techfest’08 at SLIET,Longowal</td>
<td>“Turbulance-Tech quiz” 3rd Position</td>
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<td>20) ARANYA’08 at Thapar University</td>
<td>“Mine Detector” 1st Position</td>
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<td>21) SATURNALIA’08 Thapar University</td>
<td>“Collage Making” 2nd Position</td>
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<td>22) Technique’09 at PEC</td>
<td>“Line Follower” 1st Position</td>
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<td>23) Technique’09 at PEC</td>
<td>“Robominter” 2nd Position</td>
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<td>24) LITERATI’2010 at NIT Kurukshetra</td>
<td>“Prastutti” 2nd Position</td>
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<td>25) LITERATI’2010 at NIT Kurukshetra</td>
<td>“Robowars” 2nd Position</td>
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<td>“Roborynth” 3rd Position</td>
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<td>27) Riyaaz’08 at IET Bhaddal</td>
<td>“RoboRace” Certificate of Merit</td>
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<td>28) Riyaaz’08 at IET Bhaddal</td>
<td>“Project Exhibition” Certificate of Merit</td>
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<td>29) First Prize at IIT KANPUR 2010 for Designing Rescue ROBOT</td>
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<td>30) 3rd Prize In ROBOWAR at IIT KANPUR 2010</td>
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Contact details (for any queries and registration):

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