Robosapiens™ INDIA

Course & Kit Content

Of

MATLAB with Robotics

Duration 7 Days

Kit Partner

ROBOMART.com

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Course Name	: **MATLAB with ROBOTICS**
Certification	: By Robosapiens Technologies Pvt. Ltd.
Fee	: ` 5900/- Only
Toolkit	: **FREE** to Each Participant
LIVE Projects Covered	: **MORE THAN 20 Projects** Covered in 7 Days

Detailed Course Content:

1. **Introduction to Basic MATLAB Concepts**

   1.1. Saving and loading a MAT-file
   1.2. MATLAB's Command Prompt
   1.3. Basic Reading and Writing Data from a File

2. **Introduction to Data Storage and Manipulation**

   2.1. Data Types and Operations on Point Values
   2.2. Boolean and Rational
   2.3. Strings
   2.4. Portable Functions
   2.5. Complex Numbers

3. **Arrays and Matrices**

   3.1. What is an array?
   3.2. Introduction to array operations
   3.3. Vectors and basic vector operations
   3.4. Structure Arrays
   3.5. Cell Arrays
   3.6. Sparse Matrices

4. **Introduction to Mathematical Manipulations**
   4.1. Linear Algebra
   4.2. Simple matrix manipulation
   4.3. More complicated matrix operations
   4.4. Differential Equation

4.5. Ordinary Differential Equations
4.6. Partial Differential Equations

5. Image Acquisition Tool

5.1. Device Connection
5.2. Image Preview & Device Configuration
5.3. Image Data Acquisition

6. Image Processing Tool

6.1. Display & Exploration
6.2. Geometric Transformation, Spatial Referencing and Image Registration
6.3. Image Enhancement
6.4. Image Analysis
6.5. Image Import, Export & Conversion

7. Introduction to Robotics

7.1. History of Robotics
7.2. Why Robotics
7.3. How Robotics works
7.4. Application of Robotics
7.5. Current Industrial Robotics
7.6. Future of Robotics

8. Introduction to Sensors

8.1. What is Sensor?
8.2. Various Basic Industrial Sensors-IR- Analog Sensor
8.3. IR Digital Sensor
8.4. Selection of Sensor
8.5. Basic working Technique of Sensor
8.6. Application of Sensor
8.7. How to Interface Sensor
8.8. How to Design Analog/Digital Sensors

9. Introduction to Computational Devices

9.1. What is Computational Device?
9.2. Microprocessor
9.3. Microcontroller
9.4. Difference B/W Various Computational Devices
9.5. Application of various Computational Devices
9.6. Selection of Computational Device
9.7. How to use Various Computation Device
9.8. Work on AVR Family with Mega Series (ATmega8)

10. How to work on Educational & Engineering Level Actuator

10.1. DC Motor
10.2. DC Geared Motor

11. Introduction to Driving System/Locomotion

11.1. What is Driving System?
11.2. Various Types of Driving System
11.3. Why need Driving System

12. Introduction to Programming Languages

12.1. Various programming Languages
12.2. Selection of programming Language
12.3. Need of Flow Diagram
12.4. How to write First “LED BLINKING” Code in Embedded C
12.5. Why always First “LED BLINKING” Code?
12.6. Practice on various LED Pattern
12.7. Debugging of Error Program

13. Interfacing of Anatomy of Robot

13.1. Assembling of Robot

14. Introduction to USART

14.1. Mode of Communication
14.2. Types of Communication Protocol
14.3. Difference between Different Communication Protocol (I2C, SPI, UART)
14.4. USART Registers
14.5. Programming USART

LIVE Projects Covered:

1. LED Blinking
2. Sand Glass Filling of LEDs
3. Decoration LEDs/ LED Patterns Etc.
4. Sensor Interfacing
5. DC Motor Driving
6. Black Line Follower using two IR-Sensor
7. White Line Follower using two IR-Sensor
8. Wall follower Robot
9. Edge Avoider Robot
10. Intelligent Line Follower Robot
11. PC to µC Communication
12. µC to PC Communication
13. Computer Keyboard Controlled Robot
14. GUI Switch Controlled Robot
15. Image Comparison
16. Image Pairing
17. Filtering of Noise
18. Ball Tracker Robot

7 Days KIT Contains:

S. No.	Name of the Component	Quantity	Figure
1	Robosapien's Atmega8 Development Board	1	
2	USB Cable A to B Type	1	
3	Robosapien's Educational and Software Material CD	1	
4	IR Digital Sensor	2	
5	150 RPM Single Shaft BO Rectangle	2	
6	Robosapiens Caster Wheel	1	
7	Robosapiens 76mm Wheel	2	
8	Robosapiens Chassis Board	1	
9	Screw Driver	1	
10	Nut Bolt Packet	1	
11	Robomart USB to TTL Bridge	1	
12	1 PIN Female to Female Jumper Wire	4	
20	Paper Beg/Box	1