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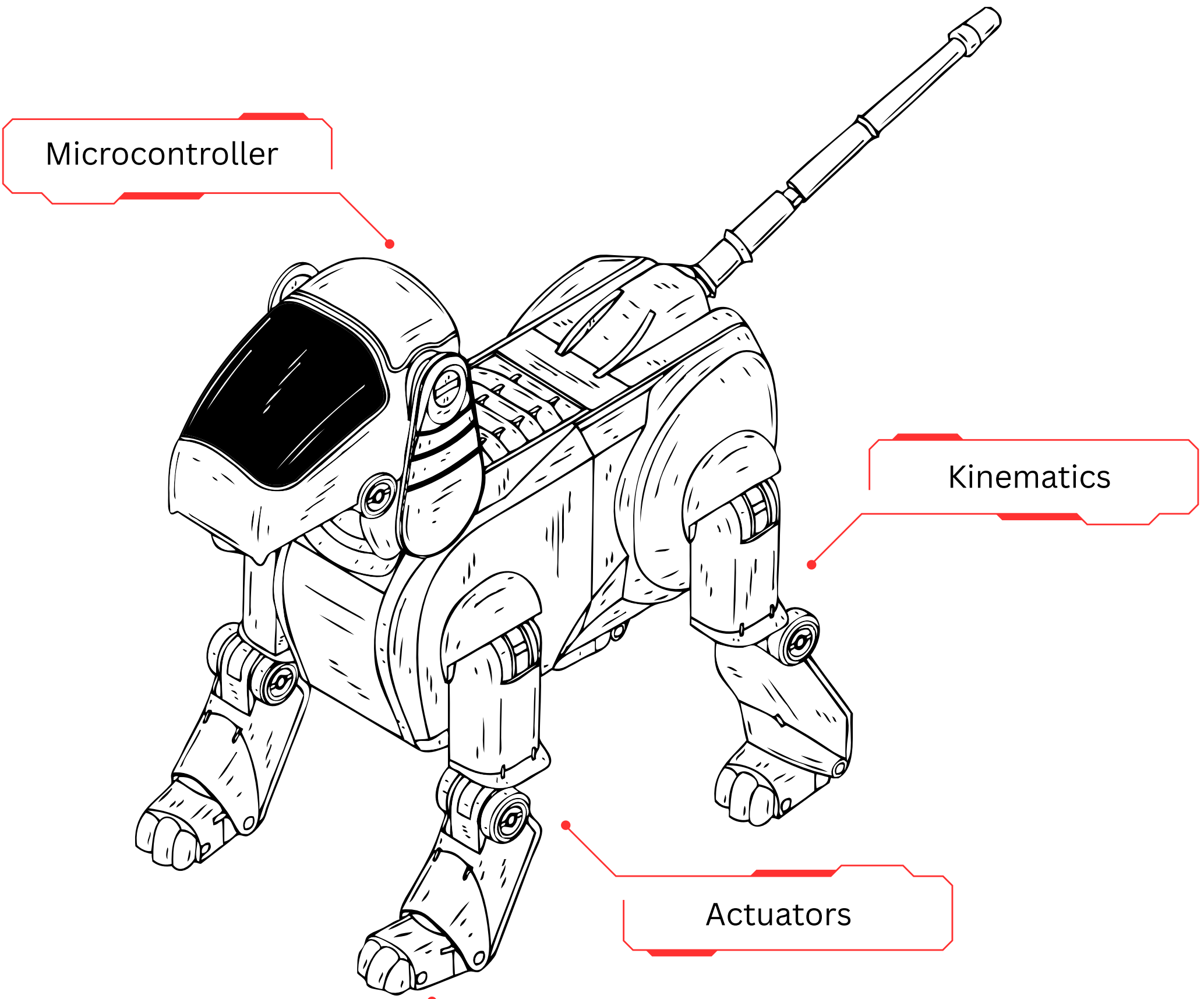
IIT Mandi
Indian Institute of Technology Mandi

SKILL DEVELOPMENT PROGRAMME



Industry-Aligned **Workshop**

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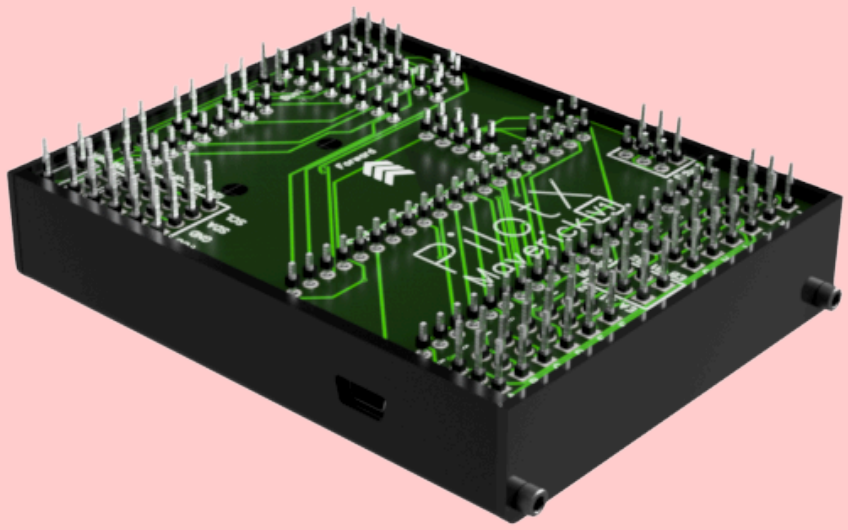
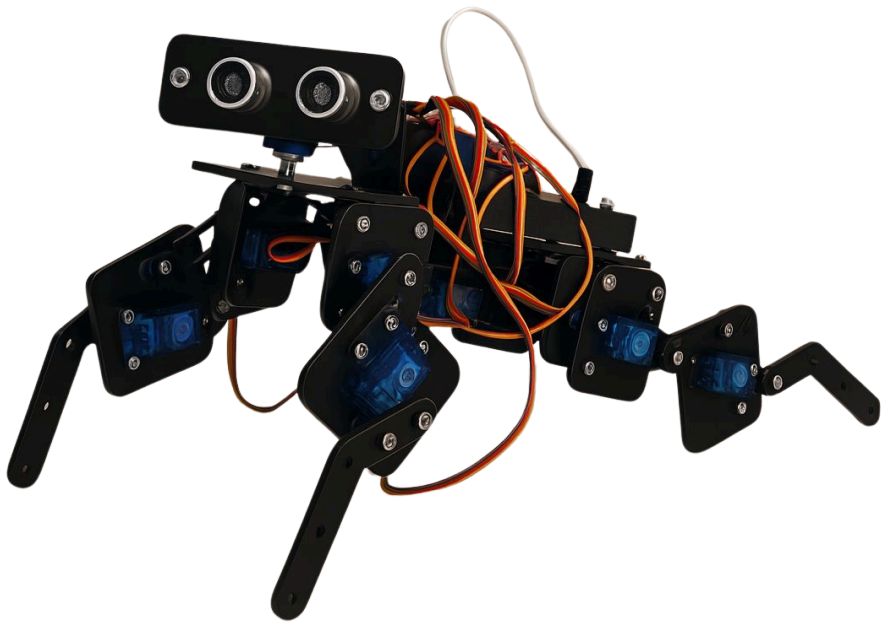
State-of-art **Robot Controller** & **Software**



Every training program conducted by us leads to a development of a final project. These projects are controlled and configured by our own developed Robot Controller "**PilotX**". This controlled is dedicatedly designed for rapid robot development and comes with a compatible drone-industry inspired Robot Control Software, "**PlannerX**" absolutely from Scratch. This software allows students to control, analyze, track and program their creative robots. With real-time maps, and advanced features, this software has become very popular among students.

- **6 In-built Sensors**
- **Micro-python enabled**
- **Code & No-Code Modes**
- **No-Breadboard Wiring**
- **UART, SPI and I2C Support**

Project 1: **Robot Dog**



This is a miniature version of the most popular **bio-mimicking robots**. These types of robots are often used in surveillance purposes in **military**. Interestingly a similar robot was spotted in **IPL matches** recently. Though the robot looks cute, the engineering behind it is quite interesting and thought provoking.

Learning Outcomes:

1. Mechanical **Assembly** & Structural Design
2. **Locomotion** Algorithms & **Programming**
3. Applied **Inverse Kinematics**
4. Servo **Dynamics** & Motion **Control Systems**

2-Day Workshop (12-hours of Training)

INR 999/- Per Student (Includes Certification, Mentorship and Training)

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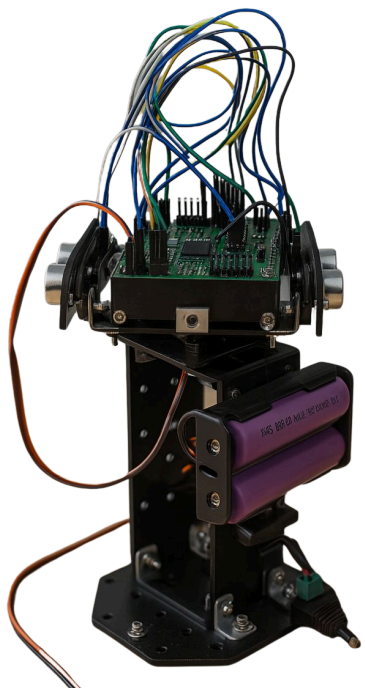
Project 2: **USAR (Ultrasonic Sensing and Ranging)**



This is an advanced engineering project where a rotating ultrasonic scanner, mimics the functionality of **LiDAR** using **sound waves**. By continuously rotating the sensor, it captures distance & directional data from all create a **real-time 2D map** of the surroundings **wirelessly**, ideal for **autonomous robot navigation**.

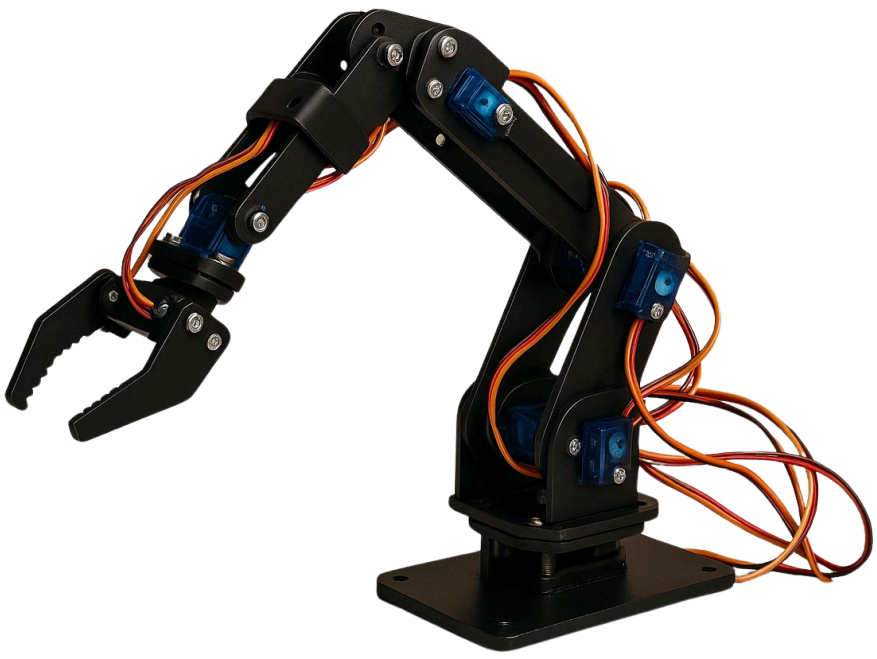
Learning Outcomes:

1. Ultrasonic **time-of-flight measurement.**
2. Servo control for **rotational scanning**.
3. **Polar coordinate mapping** algorithms.
4. Sensor data for real-time **environment modeling**.

2-Day Workshop (12-hours of Training)

INR 999/- Per Student (Includes Certification, Mentorship and Training)

Project 3: **Robotic Arm**



This compact robotic arm features **two degrees of freedom**, enabling **precise up-down** and **left-right movement**. Controlled via a **2-axis analog joystick**, it offers intuitive manual control—ideal for exploring the fundamentals of **robotic manipulation**, **kinematics**, and **human-machine interfaces**.

Learning Outcomes:

1. **Build** a 2-axis servo-powered robotic arm.
2. Interface and **calibrate a 2-axis joystick.**
3. **Control motion using PWM** and analog inputs.
4. Explore basic arm **kinematics** and movement.

1-Day Workshop (6-hours of Training)

INR 499/- Per Student (Includes Certification, Mentorship and Training)

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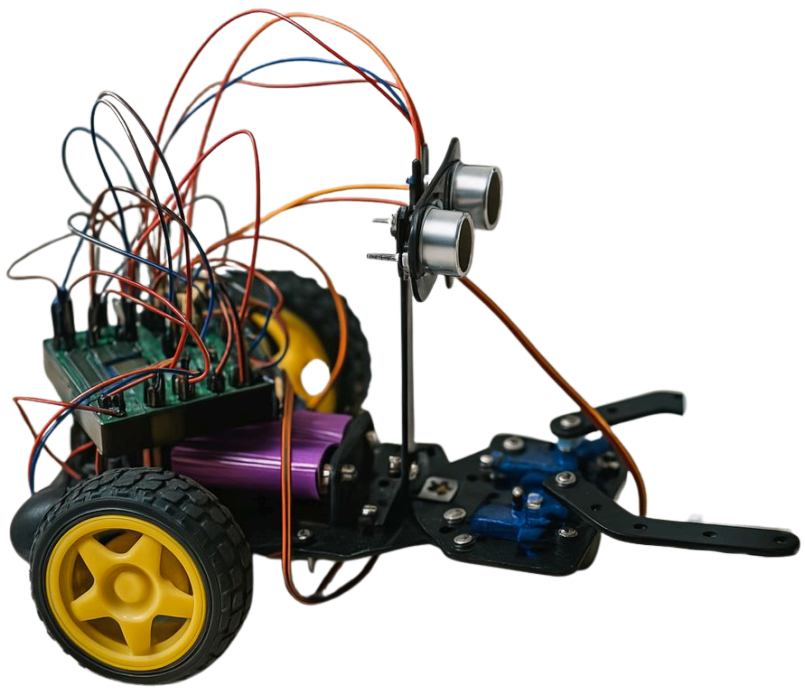
Project 4: **Obstacle Avoider Robot**



A smart **mobile robot** designed to **detect** and **remove obstacles** using sensors and a **movable claw**. Integrated with various electronic components this project is ideal for **exploring real-world problem** solving in robotics with **active intervention** instead of passive avoidance.

Learning Outcomes:

1. Build a mobile robot with **active obstacle mechanism**.
2. Interface sensors for **object detection.**
3. Control drive motors and clearing **actuators**.
4. Program **response logic**.

1-Day Workshop (6-hours of Training)

INR 399/- Per Student (Includes Certification, Mentorship and Training)

Additional Projects

- Multi-Robot
- All-Terrain Robot
- Smart Wi-Fi Parking Slot
- Motion Controlled Robot
- Ultrasonic Scanner
- Edge Avoider Robot
- Robotic Claw
- Digital Weighing Machine
- Geo-Fenced Robot
- Accident Detection Device
- Digital Pedometer
- Hash-Dodge Game Development
- Speed Measuring Gun
- Internet Controlled LCD
- Reaction-Timer
- Distance Meter
- Wi-Fi Network Scanner
- Gesture Controlled Robot
- Abstract Drawing Robot
- Obstacle Remover Robot
- Robotic Arm
- Maze Solving Robot
- Analog Clock
- Ball Balancer (PID Controlled)
- Joystick Controlled Robot
- Internet Beacon
- Brachiograph
- Analog Meter (with Filter Pass)
- Maze-Game Development

Trained	Worked With	Average Rating
5000+ Students	30+ Institutions	4.7/5 Excellent

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