

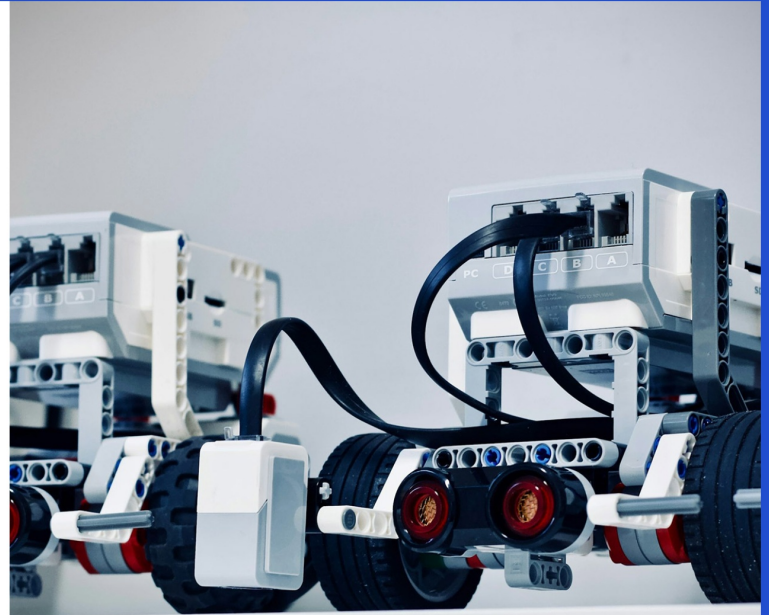
# Robotics Mission Control Overview

An introduction to robotics in automation, focusing on sensors and motors.



**SAMYUKTHA RAJA**

Board Member



# Introduction to Robotics Basics



## Programmable Machines

Robots are defined as programmable machines designed to perform specific tasks autonomously.



## Code Instructions

They operate based on pre-defined code that directs their actions and functionalities.



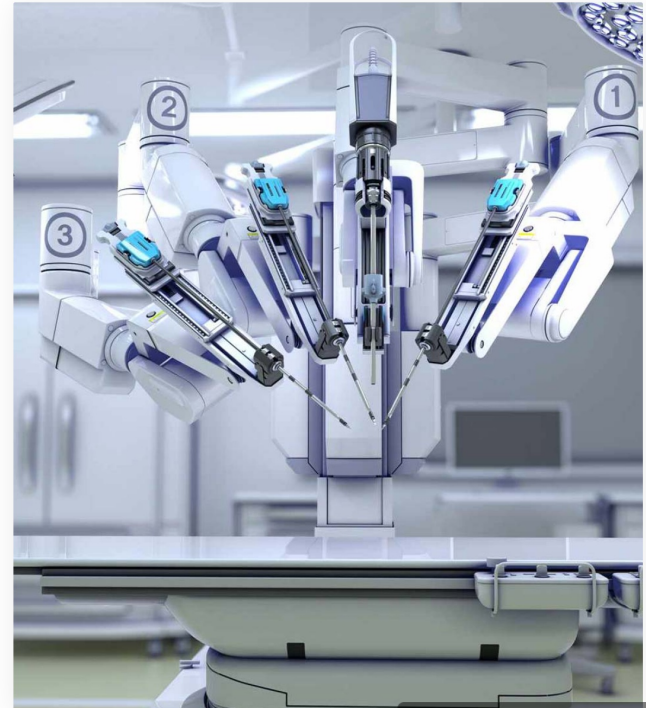
## Understanding Robotics

Grasping robotics requires knowledge of hardware, software, and operational environments.



## Versatile Applications

Robotic systems are used in various sectors like manufacturing, healthcare, and services.



# Understanding Robot Code Execution

## 01 Code instructions guide robots

Code instructions are crucial as they dictate the actions and responses of robots, ensuring proper functioning in various tasks.

---

## 02 Common programming languages

Robots are typically programmed using languages like **Python**, **C++**, and **ROS** (Robot Operating System) for efficient operation.

---

## 03 Conditional statements and loops

Using conditional statements and loops, robots can adjust their routines dynamically, enabling them to respond to changes in their environment.

---

## 04 Real-time processing enhances efficiency

Real-time processing capabilities allow robots to react instantly to stimuli, significantly improving their task performance and adaptability.

# Motor Functions in Robotics

- **Motor Functions in Robots**

Motors are crucial as they enable robots to move by translating code commands into physical actions.

---

- **Types of Motors**

Different types of motors include **servo**, **stepper**, and **DC motors**, each designed for specific applications.

---

- **Impact of Motor Choice**

The selection of motor influences **precision**, **speed**, and **control** in robotic tasks, affecting overall performance.

---

- **Motor Control and Feedback**

Motor control systems often integrate feedback from sensors to ensure accurate movement execution and task completion.

---

# Robotics in Diverse Industries

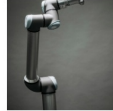
## Manufacturing Robots

**Assembly line robots** are designed to increase efficiency and reduce errors during the manufacturing process, significantly enhancing productivity.



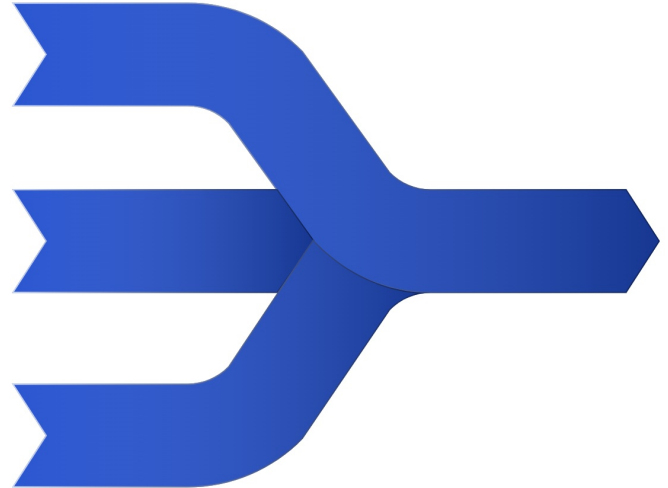
## Surgical Robots

**Surgical robots** assist in precision surgery, leading to improved patient outcomes through reduced recovery times and increased accuracy during procedures.



## Logistics Automation

**Automated Guided Vehicles (AGVs)** streamline warehouse operations by automating the transport of goods, thereby increasing efficiency and reducing labor costs.



# Sensors and Motors Integration

## Role of Sensors in Robotics

**Sensors** gather critical data about the environment, which is vital for decision-making in robotic operations.



## Enhanced System Performance

Successful integration of sensors and motors leads to improved **reliability**, **responsiveness**, and overall robotic performance.



## Obstacle Avoidance Example

In **obstacle avoidance**, proximity sensors determine the distance to objects, guiding motors to navigate safely around them.



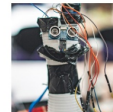
## Motor Actions Driven by Data

**Motor actions** are based on the data provided by sensors, allowing robots to perform precise movements and respond to changes.



## Feedback Loop Mechanism

The interaction forms a **feedback loop**, where sensor data continuously informs motor adjustments for optimal performance.



# Barriers in Robotics Development

Challenges	Details
Complexity in programming	Development is time-consuming due to intricate system integration.
Sensor limitations	Inaccurate sensors and motors affect overall performance.
Ethical considerations	Concerns include job displacement and autonomous decision-making.

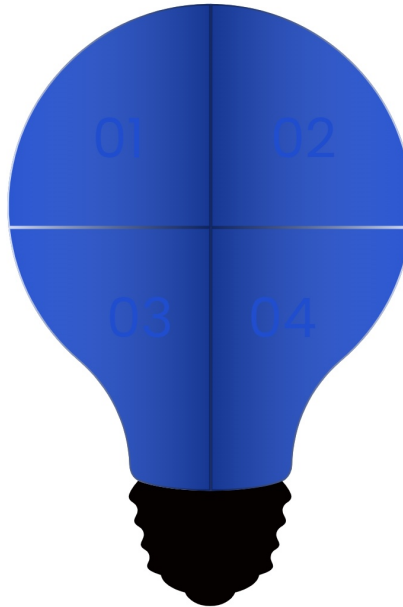
# Future Trends in Robotics Tech

## Rise of AI in Robotics

The integration of **AI** and **machine learning** enables robots to become smarter, adaptive, and capable of learning from their environments.

## Advancements in Materials

Innovations in **materials** and **power sources** are leading to the creation of more efficient, lightweight, and versatile robots for various applications.



## Collaborative Robots (Cobots)

**Cobots** are designed to work alongside humans, enhancing workplace efficiency and safety through cooperation and task sharing.

## Expanded Applications

Emerging trends in robotics are set to expand applications across multiple sectors including healthcare, manufacturing, and logistics.



# Key Insights on Robotics Today

Robotics is reshaping industries with innovation and competitive advantages.