Introduction to Robotics
Muhammad Jamil

Contents

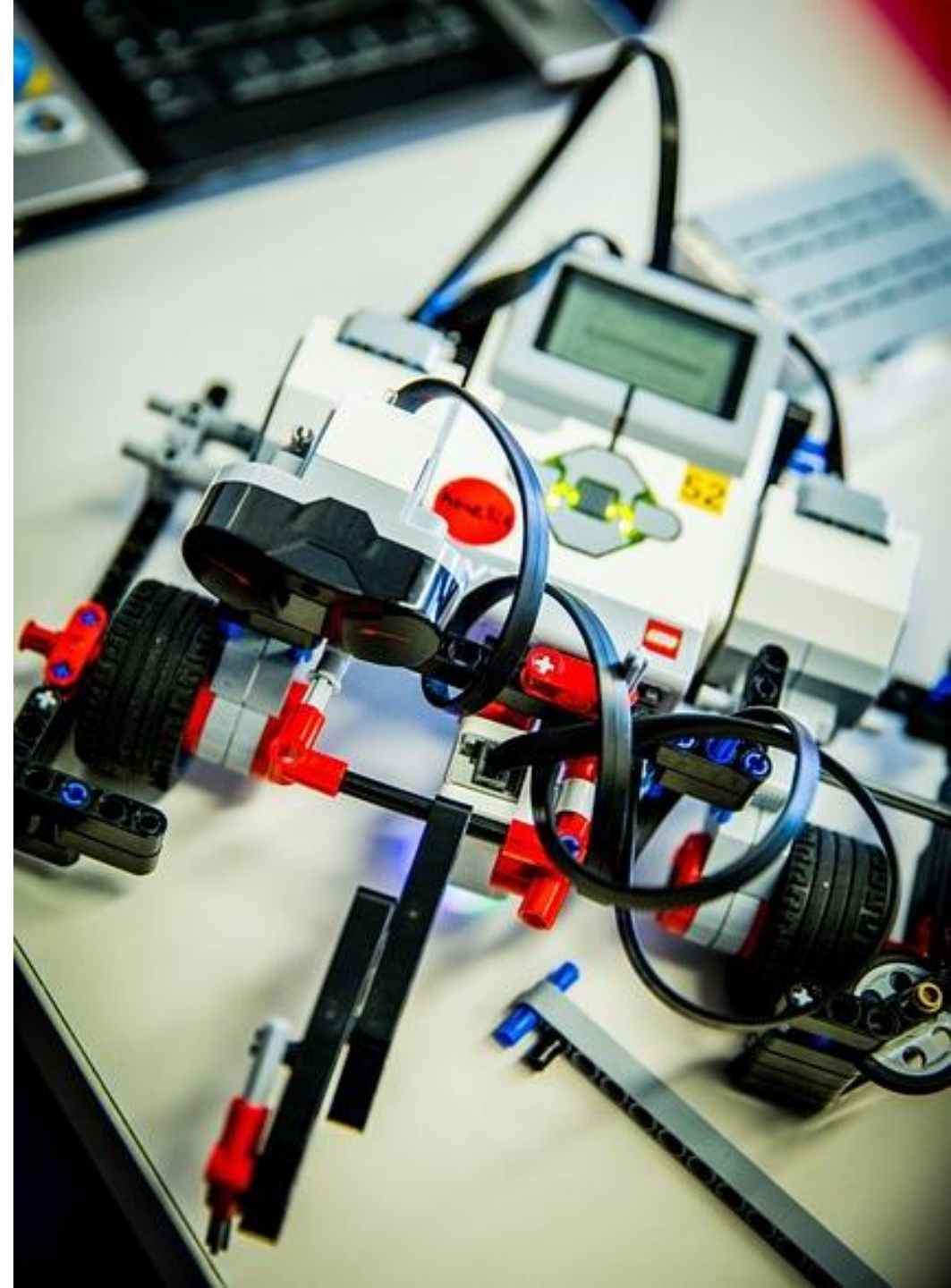Mechatronics

What is Robotics

Machine or Robot?

Essential Components of a Robot

Applications of Robotics

Use of Sensors, Actuators

Why we need Robots

Field of Robotics Associated with Mechatronics

Mecha + Tronics

Mechanical + Electronics
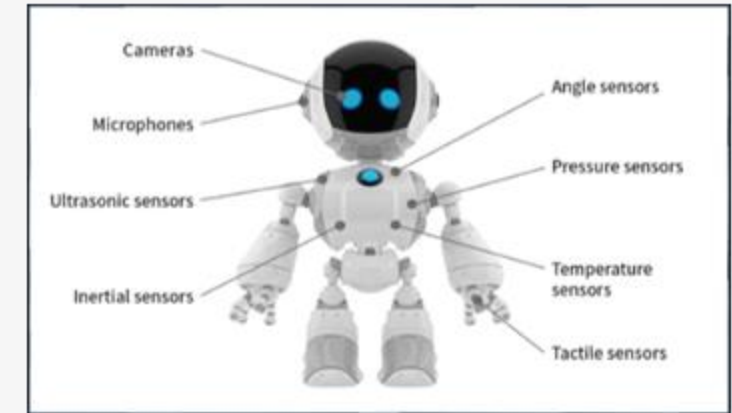(+ Computer Science)

Robotics Specifically Focuses on

Design

Construction

Operation

Cameras

Microphones

Ultrasonic sensors

Inertial sensors

Angle sensors

Pressure sensors

Temperature sensors
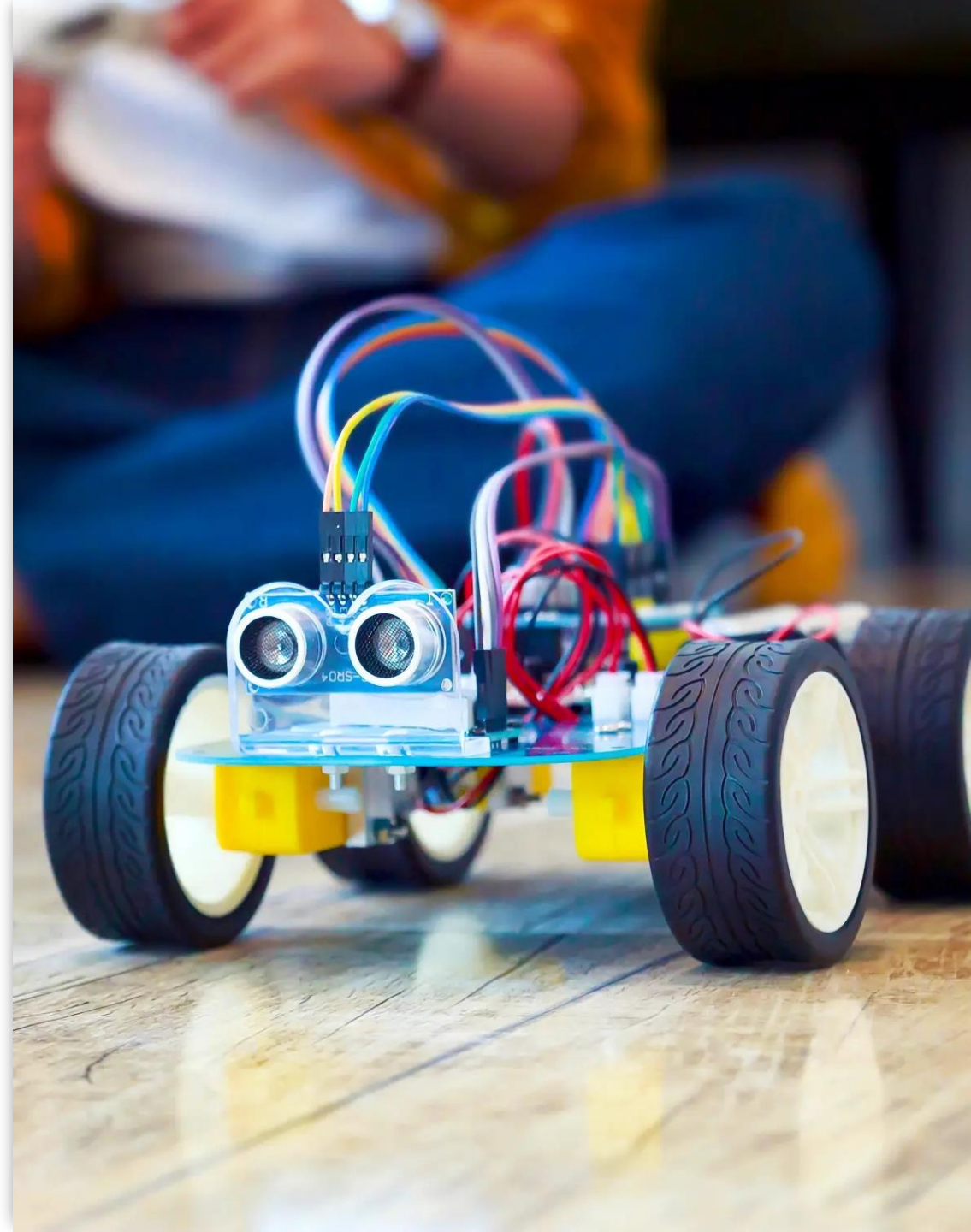
Tactile sensors

Software

Software

What is a Robot?

- A robot is like a smart machine that can do things by itself. It can understand what's happening around it, make decisions, and then do tasks to reach its goals.

or

- A robot is an autonomous system which exists or interacts with the physical world, and can sense, think and act to achieve some goals.

Machine or Robot?

Characteristics	Yes/No
Autonomous	Yes
Physical World	Yes
Sense	No
Think	No
Act	Yes

Machine or Robot?

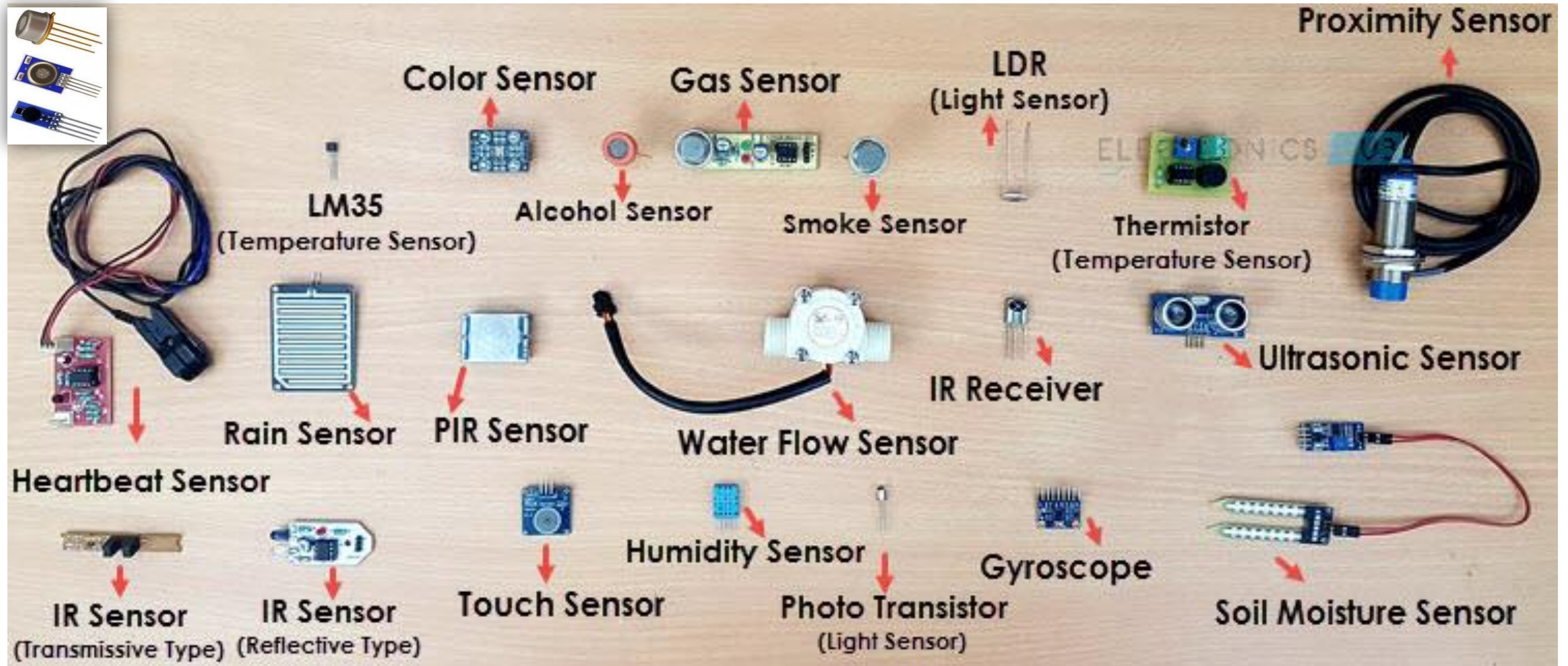| Characteristics	Yes/No
Autonomous	Yes
Physical World	Yes
Sense	Yes
Think	Yes
Act	Yes

Machine or Robot?

Essential Components of a Robot

1. Sensors (For sensing)

2. Computer Intelligence (think, control)

3. Actuation (Movement to perform actions)
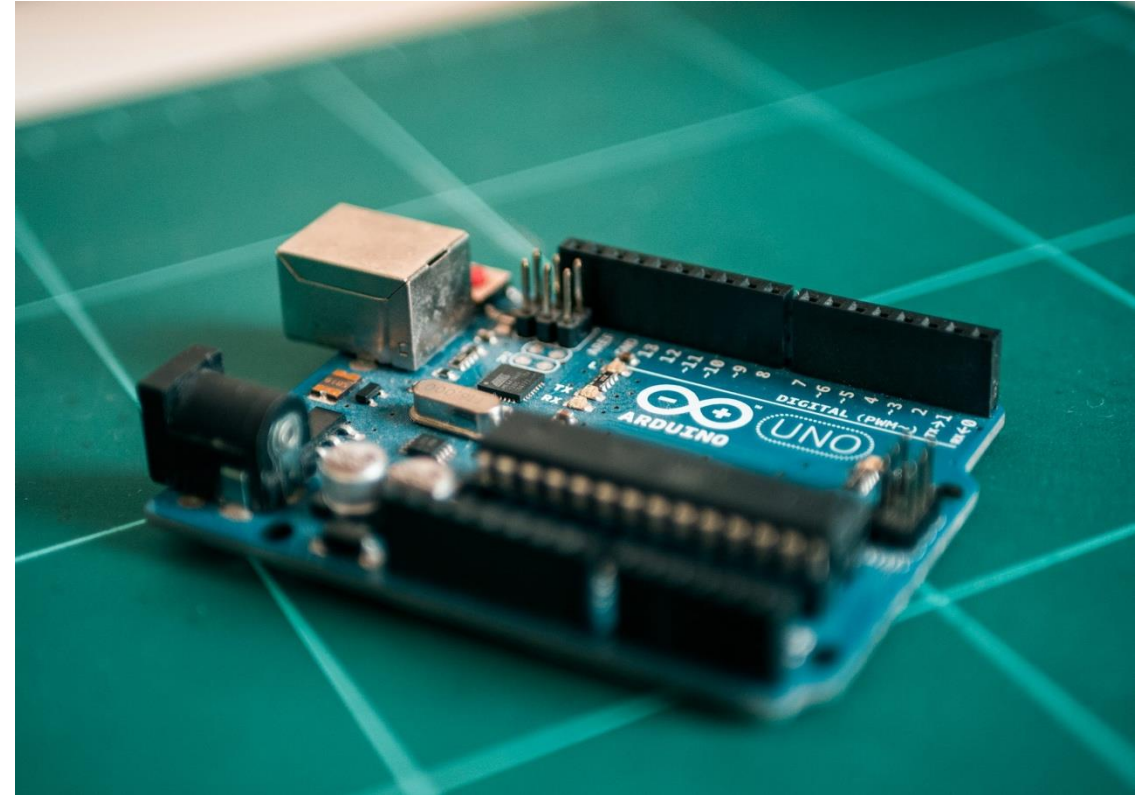
4. Energy (Battery, power supply)

Sensors

Controller

- Controller is basically a circuitry board or chip
- It controls the motion of robot
- The controller take actions being programmed by human.
- The controller we will use is Arduino Uno

Actuators

- Actuators are actually motors
- Actuators help the robot in movement.
- Actuators can be wheels, legs and rollers.
- Most common actuators in typical robot are plastic tyres

Energy

It gives power to operate robot's internal circuit.

Battery range could be in between from 3v – 12v.
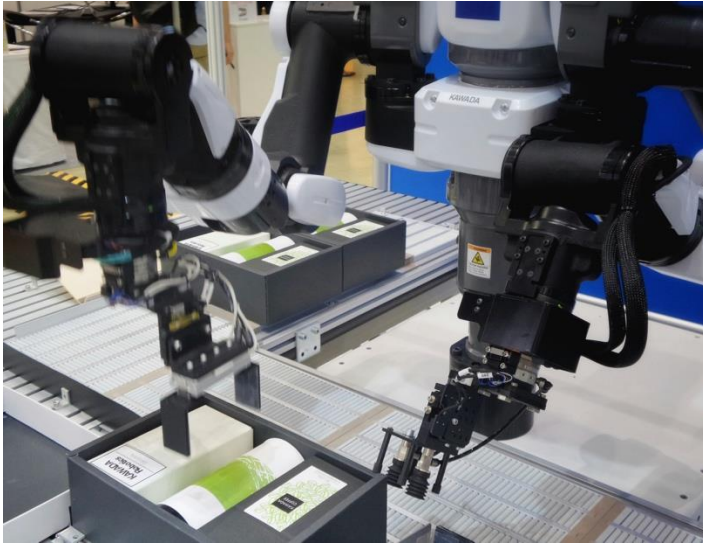
Range of power depends upon robots' structure.

Why are Robots so important today?

- Robots are omnipresent today and play a pivotal role in making our lives easier and more comfortable (You may add relevant images of the below mentioned examples)

Some Common Examples

Industrial Robot

Restaurant Robot

Medical Robot

Applications of Robotics
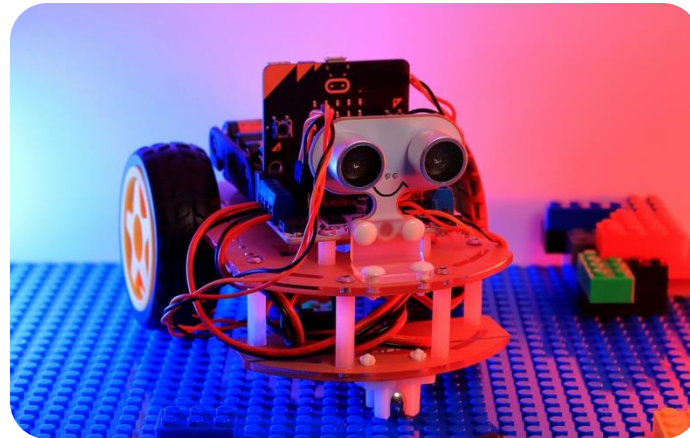
Domestic Robots

Agriculture

Exploration & Space

Applications of Robotics
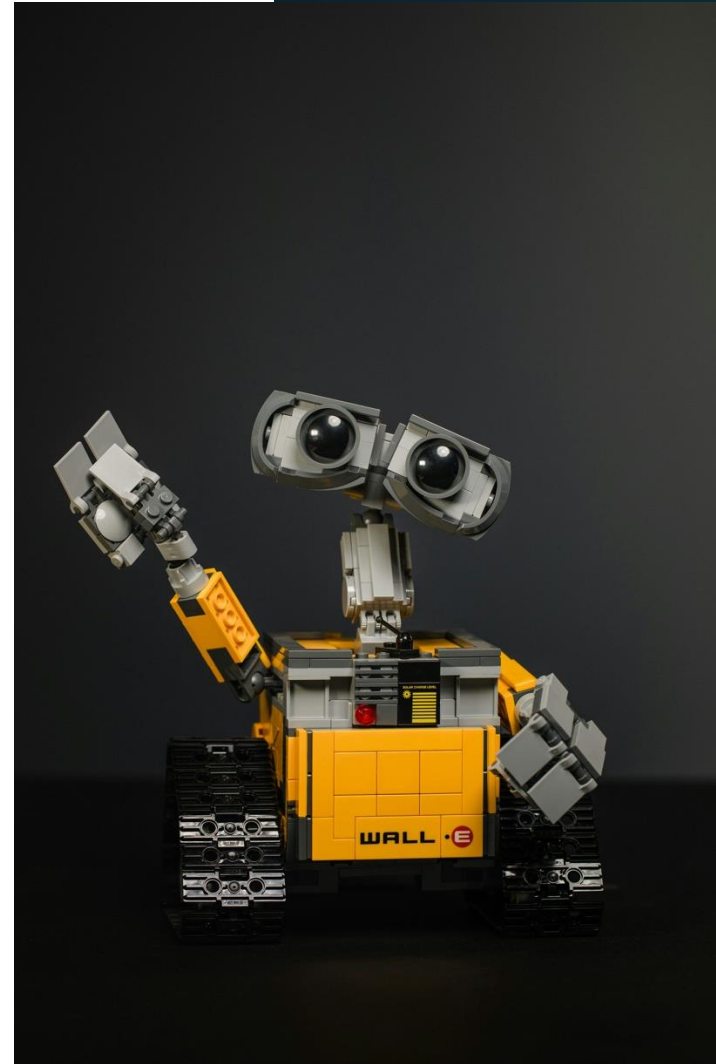
Defense and Security

Education and Research

- Wearable Robots
- Robotic Vehicles
- Customer Services Robots
- Robotic Artists

Application of Robots

- Mobile Robots

- Stationary Robots
  Autonomous Robot

- Remote Controlled Robot Virtual
  Robot

Thanks

jamil@cuisahiwal.edu.pk

https://www.linkedin.com/in/jamil226/