



# **SNS COLLEGE OF TECHNOLOGY**

## **(AN AUTONOMOUS INSTITUTION)**

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## **Department of Biomedical Engineering**

**Course Name: ROBOTICS AND AUTOMATION IN MEDICINE**

**III Year : VI Semester**

**TITLE: INTRODUCTION TO ROBOTICS AND IT'S HISTORY**

19BME307/R & A /B.Divya/AP/BME



# INTRODUCTION TO ROBOTICS



## What is a robot?

A robot can be defined as a programmable, self controlled device consisting of electronic, electrical or mechanical units.

A robot is a mechanical apparatus designed to do the work of a man. Its components are usually electromechanical and are guided by a computer program or electronic circuitry.



## ESSENTIAL CHARACTERISTICS OF ROBOTS

- **Sensing:** The robot should be able to sense its surroundings and that is only possible with the help of sensors.

### **Types of sensors:**

light sensors (eye), touch sensors (hands), hearing sensors(ears) or chemical sensors(nose)

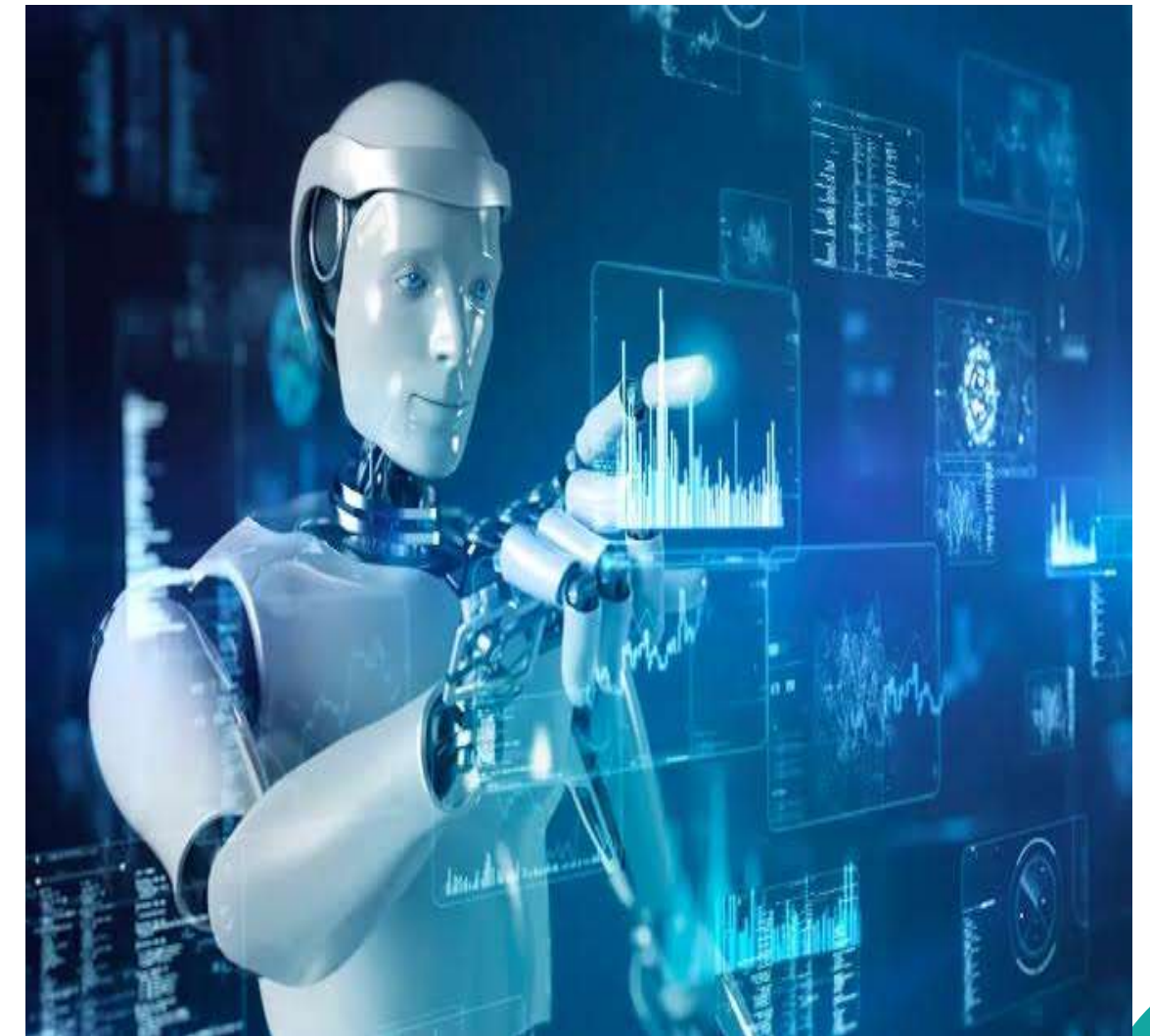
### **Movement:**

A robot needs to be able to move around its environment whether by rolling on wheels, walking, snaking or skating.

**Energy:** A robot needs to be able to power itself which depends upon its power resources e.g. batteries, power generators or fuel

**Intelligence:** A robot needs to be intelligent and smart which is only possible by the programmer person.

Vision Tit 2





## TYPES OF ROBOTS

**Mobile Robots:** They are able to move around in their environment and not fixed to one physical location.

**Industrial Robots:** They are used in industrial manufacturing environment e.g. welding, material handling, painting and others.

**Domestic Or Household Robots:** Robots used at home such as robotic vacuum cleaner, robotic pool cleaner and sweeper.

**Medical Robots:** Robots used in medicine and medical institutions e.g. surgery robots

**Service Robots:** Robots that don't fall into other types of robots used for research.

**Military Robots:** they are used in military e.g. bomb disposal robot, different transportation robots and reconnaissance drones





## ASIMOV'S THREE LAWS

### Asimov's three laws of robotics

1. Robots must never harm human beings.
2. A robot must obey the orders given by human beings, except when such orders conflict with the First Law.
3. Robots must protect themselves without violating the other rules,





## HISTORY OF ROBOTICS ASIMO



Asimo is a First humanoid Robot created by Honda.

- ASIMO was created at Honda's Research & Development Wako Fundamental Technical Research Center in Japan.
- The name ASIMO is an acronym for Advanced Step in Innovative Mobility.
- The main concept behind Honda's robot was to create a more viable mobility that allow robots to help and live in harmony with people.
- ASIMO has two Degrees of Freedom on its neck, six on each arm and six on each leg.



## USES AND ADVANTAGES OF ROBOTS



- Used in vehicles and car factories
- Mounting circuits on electronic device e.g. mobile phones
- Working where there might be danger e.g. nuclear leaks and bomb disposal
- Surgeons are performing robotic surgeries to avoid jiggles and movement in microscopically aided surgery or brain surgery
- Mail delivery to various mail stations throughout the building in large corporations
- Toy robots are a good source of entertaining for the kids e.g. dancing and talking robots
- Robots do not get bored or tired and they can work 24/7 without salary and food



## DISADVANTAGES OF ROBOTS



- It needs a high supply of power
- People can lose jobs in factories
- It needs maintenance to keep it running
- It cost a lot of money to make or buy a robot
- They are very expensive
- A robot can not respond in time of danger as human can

Vision Title 3





## **APPLICATION OF ROBOTS**

- **Manufacturing**
- **Transportation**
- **Healthcare**
- **Agriculture**
- **Construction**
- **Space Exploration**
- **Service Industry**
- **Military and Defense**

Vision Tit 2

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