Robotics technology

The study of the design, construction and operation of robots

What is a robot?

A reprogrammable, multifunctional manipulator designed to move materials, parts, tools, or specialized devices through various programmed motions for the performance of a variety of tasks.

What are robots used for?

Robots are used in industry to increase productivity, but also to perform tasks that pose immediate or long-term dangers to humans.
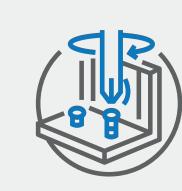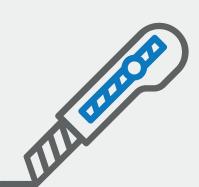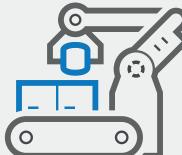
Common robot tasks

Material transfer

Installing fasteners

Cutting
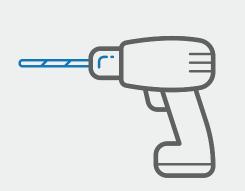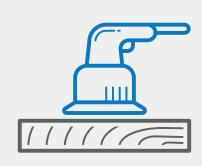
Welding

Assembly

Painting

Deburring

Buffing and polishing

Packaging

Advantages

+ Faster set-up and changeover times

+ Improved production control

+ Higher repeatability

+ Tighter quality control

Disadvantages

- Increase in maintenance costs

- High initial investment

- Training and retraining of personnel

Robot classifications

The classifications are based on the number and type of motions the robot is capable of making.

CARTESIAN

- It makes **linear motions** along the 3 X, Y and Z axes.
- Some Cartesian robots also have rotary axes.
- There are very **accurate and precise**.

Examples of tasks:
- Loading and unloading machines
- Packaging
- Assembly

SCARA

- They usually have **4 axes**: 3 rotational and one linear

Examples of tasks:
- High speed material handling
- Packaging
- Assembly

PARALLEL OR DELTA

- They have **numerous rotary axes**.
- A parallel robot moves incredibly fast

Examples of tasks:
- Sorting
- Inspecting
- Positioning
- Assembly
- Stacking

MOBILE

- Mobile robots are **used in very diverse fields**.
- Great **flexibility**.

Examples of tasks:
- Bomb disposal and reconnaissance (Military)
- To explore the surface of Mars (NASA)
- To automate the warehousing operation

ARTICULATED

- It is the most widely used robot in the **automotive industry**
- At least **six rotary axes**
- Great **freedom of movement**
- It can perform more diverse tasks than any other.
- It consists of a manipulator, a controller and an end effector.