

# Industrial Applications

What types of SENSORS are used with robots?

- Pressure sensors
- Heat sensors
- Light sensors
- Sound sensors

What is FEEDBACK?

- Having a sensor is useless unless, the sensor sends a signal to the program controlling the robot detailing the reading on the sensor.
- This is FEEDBACK, allowing the robot, via the control program, to change what it does.

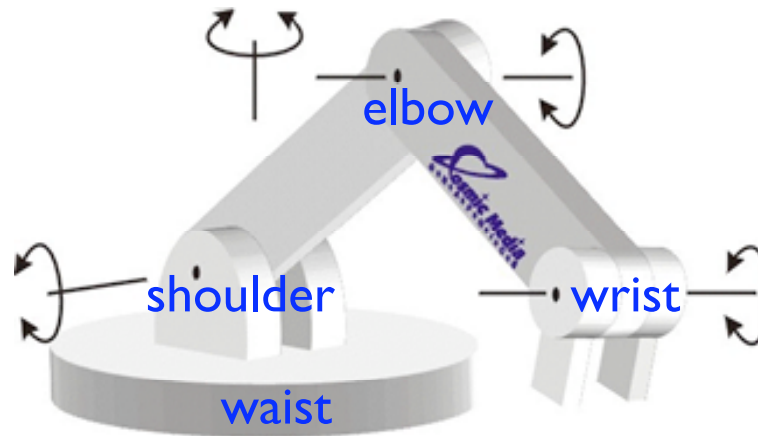
What are the advantages of Computer Aided Design and Computer Aided manufacture (CAD/CAM)?

- Allows detailed animations to be studied without the need to build a model.
- Allows for very highly detailed and precise diagrams to be produced.

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## What parts make up a robot's arm?

- ☑️ Waist, shoulder, elbow, wrist.
- ☑️ Not all of these parts need be included, but the more there are, the more adaptable the robot will be.



## What TOOLS does a robot use?

- ☑️ The tools are the part on the end of the arm, i.e the 'hand', allowing the robot to do various tasks.
- ☑️ Examples are a suction cup, gripper, welding torch, paint sprayer etc.

## What is a STATIONARY Robot?

- ☑️ One which performs its task without moving its position on the floor or area it works in.

## What is a MOBILE Robot?

- ☑️ A mobile robot moves around to perform its tasks using wheels etc.

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## What advantages are there to automated systems over manual systems?

- Robots can maintain a high level of work constantly. They don't get tired, hungry or need breaks.
- They can work in adverse conditions such as under the sea, in space, in radioactive areas, in fires.
- Robots are programmed to be very precise, e.g. Mixing highly explosive chemicals can be very dangerous unless measurements are highly accurate.

## What disadvantages are there to automated systems over manual systems?

- People will lose their jobs and may struggle to find another.
- Automated systems can cost many millions of pounds to implement.
- Maintenance budgets are very costly.
- If robots break down, the whole system may grind to a halt, again costing money.

## What is a SIMULATION?

- An imitation of a real life situation using another method such as a computer program or a custom built machine.

## What are the advantages of using a SIMULATION?

- Dangerous scenarios can be tested without the possibility of anyone being harmed.
- Simulations can cut down on the costs of using real machines such as cars when testing.