Robotics
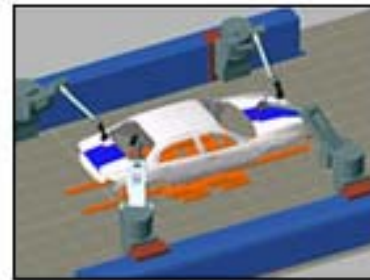# Intelligent connection of the perception to action

Applications

Applications

❖ Automotive industry

❖ Assembly

❖ Medical laboratories

❖ Medecine

❖ Nuclear energy

❖ Agriculture

❖ Spatial exploration

❖ Underwater inspection

❖ Customer service

❖ Arts and entertainement

Automotive industry

One of the most important partners in the development of robotic technologies

- ❖ Welding robots
- ❖ Robustness and precision of the assembly of pieces
- ❖ Manipulate very heavy loads
- ❖ Found in painting rooms
- ❖ Used for places that are hard to reach

Assembly

Another strong partners is the assembly of manufactured products

- ❖ Execute repetitive sequence of movement, boring, demotivating and dangerous tasks at constant performance.
- ❖ Many tools are attached at the extremity of a manipulator
- ❖ Use the optimal sequence of operations.
- ❖ Can monitor the quality assembly line with adapted enhance sensor technologies

Medical laboratories

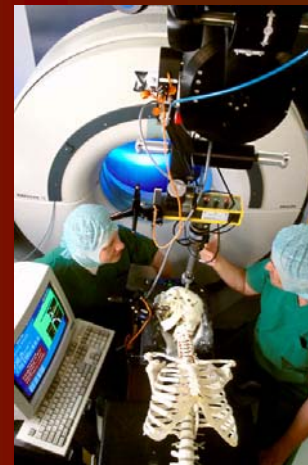Medical laboratories are another place where repetitive tasks must be made.

❖ Handling a large quantity of samples

❖ Execution of analyses

❖ Automatic systems with measurement apparatus.

❖ Small mobile units can also take charge of moving the samples between different parts of the room or services, thus eliminating the need for the technician to continuously have to walk.

Medecine

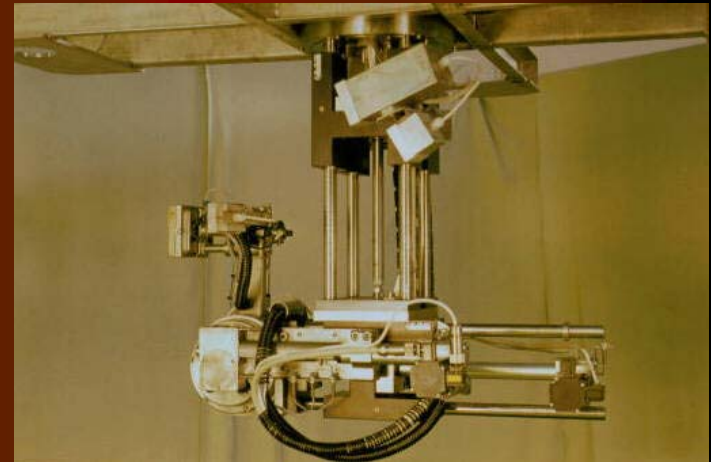As robots as getting more and more accurate and modern surgery tends to be less invasive,

❖ robotic systems now start to be developed to assist surgeons in high precision manipulation of devices.

❖ The development of biomedical applications for robotics is becoming a very important field of research of development

❖ A social motivation to improve patient cares

Nuclear energy

Nuclear generator installations are places where we can find a large number of robotic applications.

❖ Used for maintenance of nuclear reactors.

❖ Used for the replacement of radioactive fuel tubes.

❖ Seal off radioactive leakages in contaminated zones.

❖ Cleaning and decontaminating radioactive areas without compromising the health of workers was also necessary.

Agriculture

Robots have also found some applications in agriculture

❖ In Australia a robotic system has been developed for sheep shearing

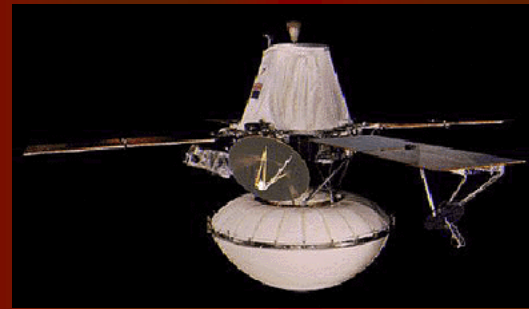❖ Robots for field sowing

❖ Raisin and apple gathering

Spatial exploration

Spatial probes sent for many years to explore and discover our universe

❖ Like the Viking I and II probes sent to explore Mars in 1976,

❖ Telemanipulator used to collect samples of soil

❖ The famous Canadian spatial manipulator Canadarm mounted on American spaceships and the new space station remote manipulator system (SSRMS) that is used to assemble the international space station.

❖ Mars Rover in 1998 explored the neighbor planet while being teleguided from the Earth.

❖ Provided an incredible amount of new information about this unknown environment.

Underwater inspection

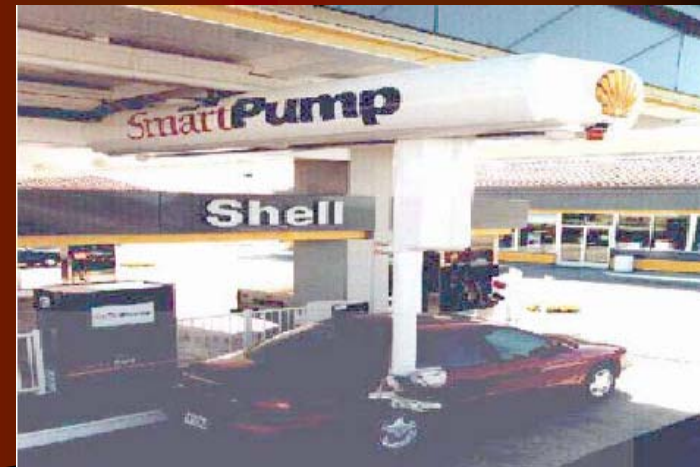Submersible robots have been used for many years to explore sea beds.

❖ Rescuing ship-wrecked persons

❖ Retrieving black boxes of crashed planes.

❖ Exploring deap sea and old wrecks in order to find their secrets.

❖ Inspection of the flooded side of dams to detect the cracks

❖ Inspect and maintain oil digging platforms

Customer service

Various machines have been develop to serve customers in a semi-automatic or fully automatic way.

❖ Automatic banking

❖ Shell SmartPump

Arts and entertainment

"playing" with sophisticated toys dedicated for funny applications.

❖ Robots that are supposed to do house cleaning

❖ AIBO, built by Sony, that have all the nice characteristics of a real dog but without its obvious disadvantages.

❖ Remotely controlled robots used to do fun painting

❖ Considered as a very positive and innnovative way of evolution in robotics.

To conclude

By definition, robotics is a multidisciplinary science.

collaboration of numerous participants from various fields

- ❖ mechanical engineering
- ❖ electrical engineering
- ❖ computer science
- ❖ Physics
- ❖ Mathematics

Robotic system are everywhere.

They improve our life and help us in various ways...

But the adaptation capability of humans is far from being reproduced by automata