Unit C: Agricultural Power Systems

Lesson 9: Using Robotics Systems

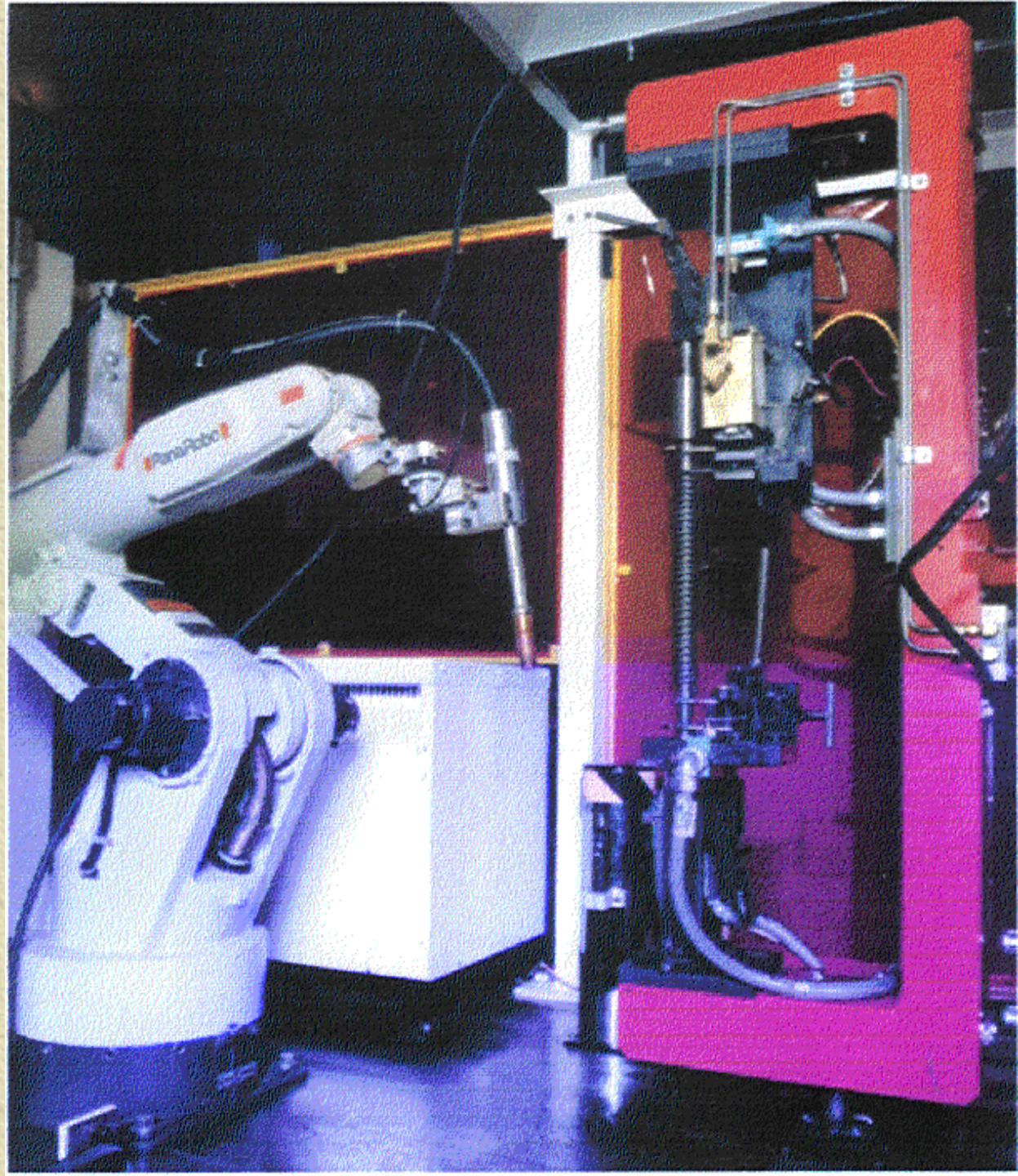
Terms

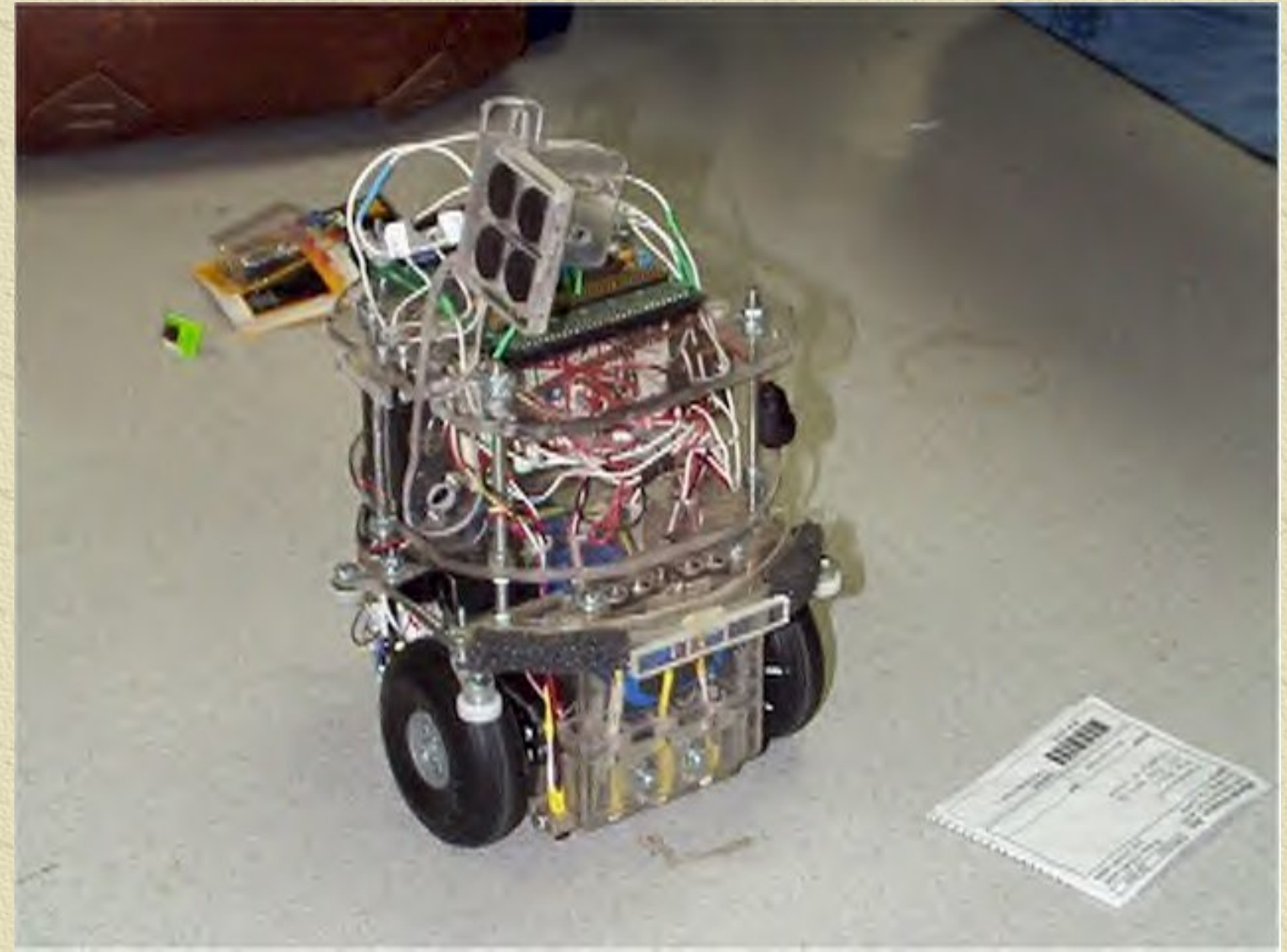
- Axis
- Cartesian work area
- Cylindrical work area
- Hollow sphere working area
- Robot
- Robotics
- Rotation
- Solid sphere working area
- Translation

Robot

- A mechanical device that is capable of performing human tasks
- Widely used in industry and become more common in agriculture
- Powered by hydraulics, pneumatics,and electricity

Robot





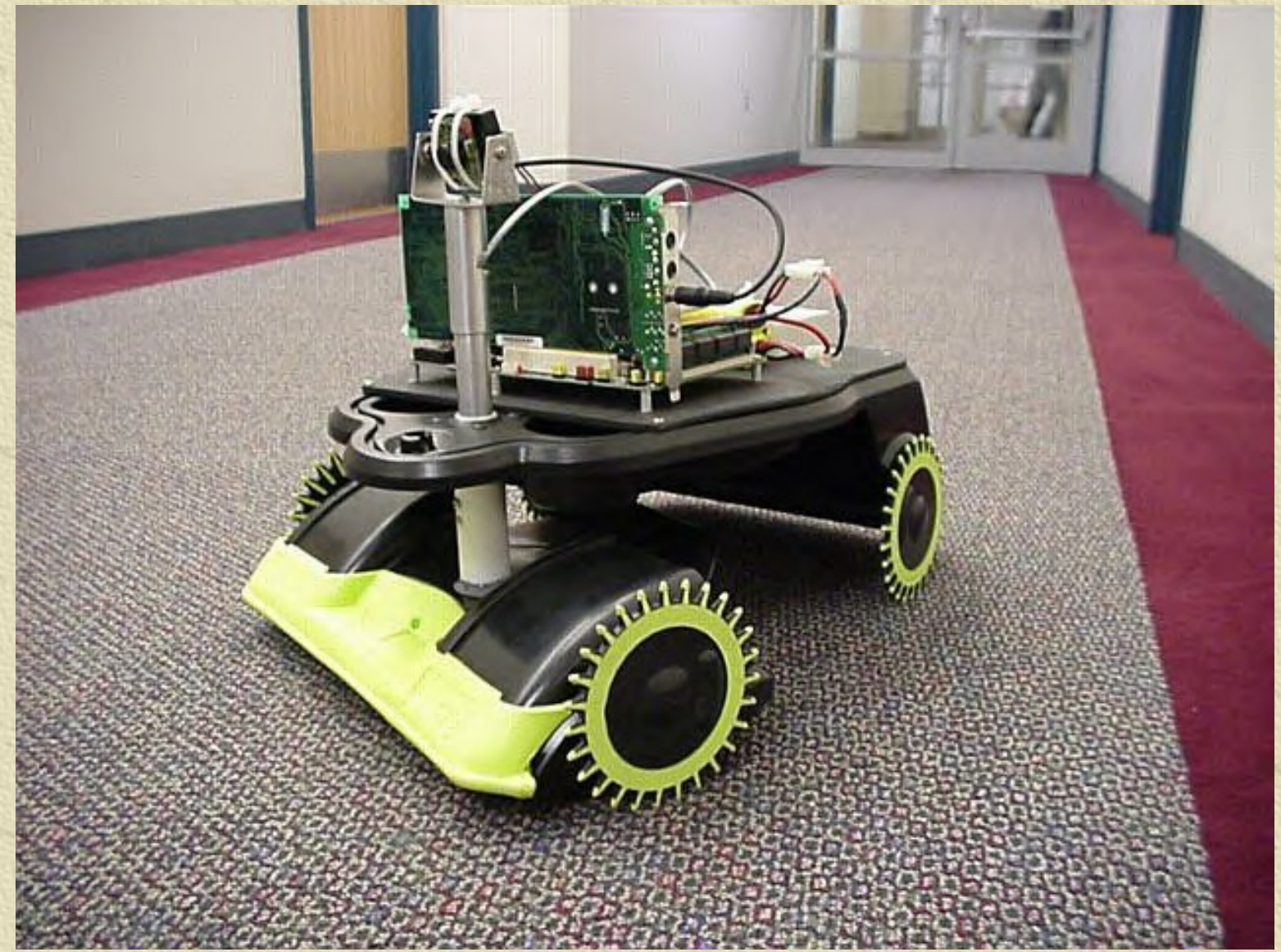
Robotics

- Term used to describe the application of robot technology


Husqvarna

Robots differ from other machines in these areas:

1) Robots are freely computer programmable
2) Robots are able to do a variety of tasks
3) Robots have a three dimensional freedom of motion
4) Robots are equipped with grippers and/or tools



Robotic tasks

- Robots can be built for a variety of tasks.
- They can do these tasks faster and more accurately than humans
- Robots have precise movements and are able to repeat the exact same movements for extended periods of time

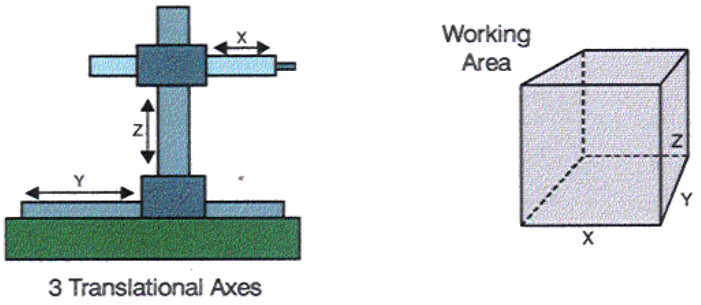
Robotic functions

- Arranging parts
- Handling parts
- Distributing items
- Positioning tools and work pieces
- Moving tools in predetermined patterns
- Gripping, directing, and assembling
- Fastening, attaching, and detaching

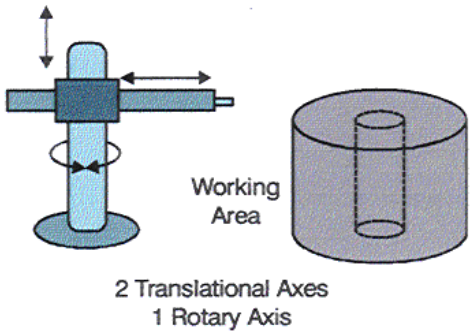
Robotic motion

- **Rotation** – circular robotic motion
- **Translation** – linear robotic motion
  - **Axis** – the straight line around which a body rotates
  - The more axes the robot has, the more motions it can perform

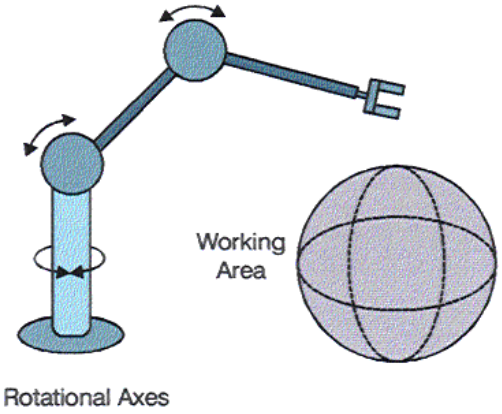
Agricultural robotic arm



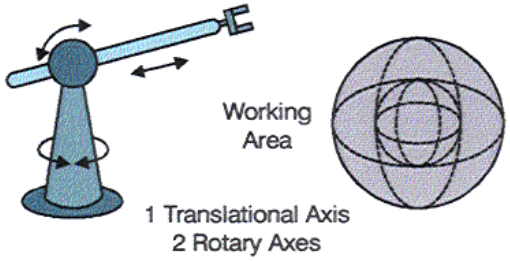
The cartesian work area of a three-translational robot.



A cylindrical work area is possible with two translational axes and one rotational axis.



A solid sphere work area is possible using three rotational axes.



A hollow sphere work area is possible using two rotary axes and one translational axis.

(Courtesy, Interstate Publishers, Inc.)

Space of robotic motion

- **Cartesian work area** – a box-like work space
- **Cylindrical working area** – working area in the shape of a cylinder
- **Hollow sphere working area** – ball-shaped
- **Solid sphere working area** – robot motion similar to a solid ball

Review/Summary

- What terms are commonly used when discussing robotics? How do robots differ from other machines?
- What are some common function of robots?
- What types of motion are robots capable of?