

Myke's Rules of Robotics

Throughout this book, I will be keeping to my 10 rules of robotics:

1. Start small.
2. Design everything together.
3. Jerkiness in a robot is not a selling point.
4. Protect your drivetrains from the environment.
5. Keep the robot's center of mass in the center of the robot.
6. The faster a robot runs, the more impressive it is.
7. Object detectors should detect objects far enough away from the robot so that it can stop before damaging the object or itself.
8. Complexity adds weight.
9. Weight adds weight.
10. If the robot isn't doing anything, it shouldn't be expending any energy.

Section One

Introduction to Robots

When you think of the term “robot,” what comes to mind? The following are some definitions that attempt to explain what a robot is:

A true robot is a machine that can be “taught,” programmed like a computer, to make different kinds of motions and perform a variety of jobs. . . . Machines that do one job only and cannot be “retrained” are not true robots, either.

The New Book of Knowledge, 1998

Robotics A field of engineering concerned with the development and application of robots, as well as computer systems for their control, sensory feedback, and information processing. There are many types of robotic devices, including robotic manipulators, robot hands, mobile robots, walking robots, aids for disabled persons, telerobots, and microelectromechanical systems.

The McGraw-Hill Encyclopedia of Science & Technology, 8th Edition

A **robot** is a mechanical device that operates automatically. Robots can perform a wide variety of tasks. They are especially suitable for doing jobs too boring, difficult, or dangerous for people. The term robot comes from the Czech word *robota*, meaning *drudgery*. Robots efficiently carry out such routine tasks as welding, drilling, and painting automobile body parts.

The World Book Encyclopedia, 1995

A **robot** is a machine that performs a task automatically. The robot’s actions are controlled by a microprocessor that has been programmed for the task. The robot follows a set of instructions that tell it exactly what to do to complete the task.

World Book’s Young Scientist, 2000

robot /ro:bot/n. **1** a machine with a human appearance or functioning like a human. **2** a machine capable of carrying out a complex series of

actions automatically. **3** a person who works mechanically and efficiently but insensitively.

The Canadian Oxford Dictionary, 1998

Humans are the ultimate generalists, with a form designed by millions of years of evolution to respond to a very wide variety of circumstances. The science and technology of robotics is usually concerned with building machines to perform a much smaller number of tasks within a specific set of problems, such as inspection or assembly parts on production lines. Such robots generally have a much simpler form. They often consist of a jointed arm with a gripper or other devices that work like a hand and a microprocessor that functions like a brain.

Encyclopedia of Technology and Applied Sciences, 1994

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

Robot Institute of America, 1979

Now, here we go on a more-detailed examination and explanation of robots, which, to coin a definition, are fully automated machines which may respond to external stimuli as well as to internal commands which have been prerecorded. It is important to note that we have here the term “robot,” which is different from android, or droid for short, or from humanoid, another term associated with these machines.

The Complete Handbook of Robotics, 1984

Robot Any mechanical device that can be programmed to perform a number of tasks involving manipulation and movement under automatic control. Because of its use in science fiction, the term *robot* suggests a machine that has a humanlike appearance or that operates with humanlike

capacities; in actuality modern industrial robots have very little physical resemblance to humans.

AP Dictionary of Science and Technology

Robot

(1) A device that responds to sensory input.

(2) A program that runs automatically without human intervention. Typically, a robot is endowed with some artificial intelligence so that it can react to different situations it may encounter. Two common types of robots are *agents* and *spiders*.

Webopedia

A robot is a machine designed to execute one or more tasks repeatedly, with speed and precision. There are as many different types of robots as there are tasks for them to perform.

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A robot has three essential characteristics:

- It possesses some form of mobility.
- It can be programmed to accomplish a large variety of tasks.
- After being programmed, it operates automatically.

Australian Robotics and Automation Association

1. A robot may not injure a human being, or, through inaction, allow a human being to come to harm.

2. A robot must obey the orders given it by human beings except where such orders would conflict with the First Law.

3. A robot must protect its own existence as long as such protection does not conflict with the First or Second Law.

Isaac Asimov

Clearly, no one single definition encompasses what a robot is and how it is supposed to work. Different people have widely different and often conflicting ideas of what a robot is and what it isn't. Many different types of robots exist, each one meeting some of the definitions above.

In the following pages, I will investigate some of the different types of robots and introduce you to many of the skills and much of the knowledge to create your own robots.

Just remember that if you create a robot to take over the world and it fails, when the authorities come you've never heard of me or this book.