Robotics Badges: *Programming Robots 1*

Glossary for Ambassadors

Actuator – the part of a robot's power system that makes it move, such as an electric motor or hydraulic pump.

Algorithm – a set of step-by-step instructions to carry out a task. Directions to travel from one place to another, a recipe and a computer program are all types of algorithms.

Artificial intelligence (AI) – a type of computer program that acts as if it can think like a human. For example, AI is used in devices that answer people's questions and hold conversations using ordinary language.

Binary – a way of presenting information using only two symbols. In math, a binary system consists of the numbers 0 and 1.

Biomimicry – using animals, humans, or other living things as models for a robot's design.

Bug – a problem in a computer program. To get rid of the problem, you debug the program.

Chatbot – a type of computer program designed to understand and respond in normal spoken language, such as Apple's Siri® or Amazon's Alexa®. Although they often don't have bodies that let them act in the physical world, they are usually considered a type of robot.

Circuit – a path for electricity to travel along. Most circuits are designed as loops, with a switch that can open and close the circuit, like a drawbridge. A circuit must be closed for electricity to flow.

Coding – also known as programming, the task of writing a computer program (or code) that tells a computer what to do.

Command – one step in a computer program.

Compliant robot – a robot designed to be safe for people to use when it is in action. For example, it may have an automatic shut-off for when it comes in contact with a person or be made of lightweight material that can't harm someone if it bumps into them.

Computer program – a set of instructions, or an algorithm, that tells the machine what to do.

Conditional statement – in a computer program, a rule that tells the computer to make a choice between two or more actions, depending on whether a certain condition is true or false (or equal to a particular amount).

Conductive materials – substances that carry electricity easily, like metal.

Controller – the robot's "brain," it processes information and decides how to react. Examples include computers and microcontrollers.

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Data – information that a computer can understand.

Debug – go through a computer program to look for problems, or bugs, and correct them.

Design Thinking Process – a method used to create good, useful products. The steps include defining a need, designing and building a prototype, testing it, and then making improvements by repeating the process.

Documentation – keeping a record in words and pictures of designing a building a project.

Effector – a robot part that moves. Arms, grippers, legs, wheels, treads, and propellers, as well as the head (if it can turn), tail, wings, fins, tentacles, antennae, and any other movable parts are all types of effectors.

Electricity – the flow of electrons from one atom to another. When the energy from a chemical reaction or other source knocks an electron off an atom, electrical current begins to flow.

Elevator pitch – a short, enthusiastic explanation of your project that would make a listener interested in helping you produce it.

Function – a series of commands that is given a name. When you "call" the function, those steps are carried out.

Housing – a robot's body. It can be made of anything from metal and plastic to inflatable vinyl, lightweight cardboard, or soft silicone rubber.

Input – data that is sent to a robot's controller, usually by an electronic sensor.

Insulation – materials that don't carry electricity easily. They are used to cover conductive materials and keep electricity from leaving the circuit.

Iterate – to repeat something over again.

LED – short for "light emitting diode," an electronic component that acts like a tiny low-energy light bulb. They are found in flashing toys and as indicator lights in most electronics.

"Left Hand on Wall" rule – a method for solving a maze that is often used as a robotics programming challenge. It says that if you always keep your left hand on the wall as you walk through a maze, you will eventually end up at the exit.

Load – the component that is being powered by an electrical circuit. It can be a motor, a light, a buzzer, or anything that uses electricity to run.

Locomotion – the ability to move from one place to another.

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Loop – a computer programming shortcut that tells the computer to go back and repeat a series of commands.

Output – an action that a robot takes after it processes input using a computer program or other kind of control.

Programmable body – a way of controlling how a robot moves by changing its physical design.

Prototype – a rough model used for seeing what a robot design will look like and testing it out.

Pseudocode – a computer program written in everyday language. It is used as a quick way to plan out a computer program without translating it into a programming language.

Robot – a machine that can take in information about its environment, analyze that information to make decisions about what to do next, and then perform an action in the physical world around it. This is known as the **Sense-Think-Act** definition of a robot.

Roboticist – a scientist who works on robots and related technology.

Robotics – the branch of technology that deals with designing, building, and using robots.

Scale Model – a smaller version of an object that has the same shape as the finished design.

Sensor – an electronic component that can detect conditions around it. On a robot, sensors transmit information to the robot's controller about its environment.

Social Robot – a robot designed to look and act in ways that makes it appeal to humans. Social robots often use AI in their programming.

Syntax – the set of rules used by a language. It includes spelling, spacing, symbols, and punctuation.

Uncanny Valley – an unwanted effect of robots that look almost real which makes them seem creepy instead of life-like.