

## 7 ACTUATOR CONTROL TECHNIQUES

Motors and actuators are essential components of many robotic systems, as they allow robots to move and manipulate their environment. In Arduino robotics, there are several types of motors and actuators that you can use, depending on the specific needs of your application.

Some common types of motors and actuators that you can use with Arduino include:

**DC motors:** These are simple motors that rotate at a constant speed when a DC voltage is applied. They are commonly used to drive wheels or other mechanisms. To control a DC motor with an Arduino, you will need a motor driver, such as an H-bridge, which allows you to control the direction and speed of the motor.

**Stepper motors:** These motors have multiple coils that can be energized in a specific sequence, allowing them to rotate in precise increments. Stepper motors are commonly used in applications that require precise positioning, such as 3D printers or CNC machines. To control a stepper motor with an Arduino, you will need a stepper motor driver, such as a ULN2003 or L298N.

**Servo motors:** These motors have built-in feedback control and can rotate to a specific angle. They are commonly used to control the position of a mechanism, such as a robotic arm or a camera. To control a servo motor with an Arduino, you can use the Servo library and the write function, which takes an angle as an argument.

**Linear actuators:** These are motors that produce linear motion, rather than rotary motion. They are commonly used to move mechanisms or lift loads. To control a linear actuator with an Arduino, you will need a motor driver, such as an H-bridge, and you can use the analogWrite function to control the speed and direction of the actuator.