

The Physical Side of Interactivity

Sensors and Actuators

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Learning Goals

- What an IoT device is, what it typically does
- What are typically their most essential components

What is an IoT device

- IoT thing is a physical object that has
 - **Microcontroller** Information processing, computing, logic
 - **Connectivity** Communicating with other devices
 - **Power source** Electrical power
 - **Sensors** Responding to the environment
 - **Actuators** Do something to the environment

What is an IoT device

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Sensors? Please tell me examples

- Car proximity sensor –
- Temp sensor –
- Accelerometer –
- Gyroscope –
- Blood glucose monitoring sensor
- pH
- Pressure sensors
- Heart rate sensor
- Camera laser sensor
- Radiation sensor
- Light sensor

Actuators. Examples, please!

- LED (or other light that is controlled by the IoT thing =microcontroller)
- Motors
 - Linear stepper motors
 - Solenoid
- Pneumatic/hydraulic actuators (forms of linear)
- Speaker

- Oscillator (but is this only inside the IoT?)

Two sensors: Button and switch

- A button is a device that closes/opens the electric circuit temporarily
- A switch changes the state of the circuit (e.g., on/off)



Two motors: Servo & Stepper

- Can do very much the same thing – turn the shaft
- The practical difference in here:
 - **Servos** have a limited range, i.e., cannot turn very long into one direction before stopping.
 - **Steppers** can run continuously, so, you can, e.g., use them to drive continuous wheels.