Lesson 6

Hardware Resources: Waziup Sensors

Course One
Objectives

- Introduction to sensors
- Sensor configurations
- Sensors for Waziup
Introduction to Sensors

According to Wikipedia a sensor “is a device, module, or subsystem whose purpose is to detect events or changes in its environment and send the information to other electronics, frequently a computer processor”.
A sensor is always used together with other electronics.
Sensor Configurations

- **Stand Alone Sensors**
  Single embedded system with one sensor. These are used in commercial, industrial or Infrastructural IoT to add an overlay network to existing product that’s too costly to replace.

- **Sensor Array**
  One embedded system with multiple sensors. They are generally used in consumer IoT and newer systems. Sample sensors are seen in the next slides
Sensors for Waziup

The Fingerprint sensor makes adding fingerprint detection and verification to your project super simple. It contains a high powered DSP chip that does the image rendering, calculation, feature-finding and searching.
Sensors for Waziup

The heart rate sensor closely emulates a real electrocardiography machine by measuring electrical pulse. This device use light to track your blood. By illuminating your capillaries with an LED, a sensor adjacent to the light measures the frequency at which your blood pumps past.
Sensors for Waziup

Soil moisture sensors measure the volumetric water content in soil by means of two metallic prongs. Water coming into contact with these prongs closes a circuit and causes an amount of current to flow in proportion to the volume of water.
Sensors for Waziup

The digital temperature and humidity sensor uses a capacitive humidity sensor and a thermistor to measure the surrounding air, and gives out a digital signal on the data pin.
Sensors for Waziup

The NEO-7M GPS module series combines high performance with low power consumption and high sensitivity to accurately produce GPS coordinates for most location based use-cases.
Sensors for Waziup

HC-SR501 is based on infrared technology with high sensitivity, high reliability, low-voltage operation mode and is widely used in various automatic motion sensing equipment.
Sensors for Waziup

The MPU-6050 is a very accurate accelerometer and gyroscope all combined on a single chip.

It contains 16-bits analog to digital conversion hardware for each channel, therefore it captures x, y, and z data at the same time.
Sensors for Waziup

A light dependent resistor, also known as a photoresistor or cadmium sulfide cell generates variable signals based on its ability to change its resistance with regards to how much light falls on it.
Sensors for Waziup

The MQ-135 air quality gas sensor module is widely used in air quality control equipments for buildings/offices, are suitable for detecting of NH3, NOx, alcohol, Benzene, smoke, CO2 and similar elements.
Sensors for Waziup

The HCSR04 Ultrasonic sensor module provides 2cm – 400cm non-contact measurement, with an accuracy of up to 3mm.

The module includes an ultrasonic transmitter, receiver and control circuit.
Lesson Highlights

- Sensors are devices that monitor for changes in the physical world and relay that information to some form of micro or computer processor.
- There are two main configurations to sensors, that is stand alone or sensor array configuration.
- Most sensors available today can be integrated and used with waziup.
Conclusion

In conclusion, Waziup supports most sensors in existence to create, build and deploy sustainable and efficient IoT solutions.
Links

- https://www.inventelectronics.com/product/mpu-6050-3-axis-gyro-3-axis-accelerometer/