

IoT - Internet of Things

1. OVERVIEW

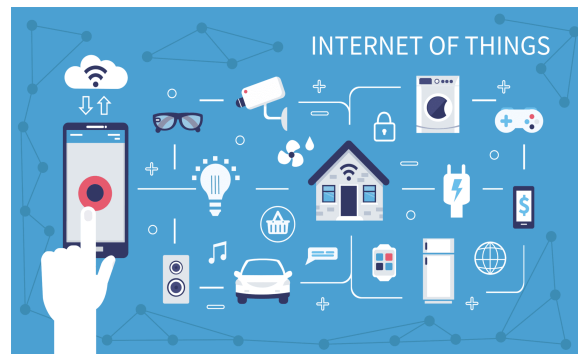
The Domain of IoT, or Internet of Things, refers to the interconnection of various sensors or components which collect data, to later process that data and give meaningful analysis.

Both IoT and Robotics share nearly the same base. The main difference is how they're applied and used.

Robotics is used in more autonomous systems, Think of it like a Sense-Think-Act loop. Robotic Machines gather data from sensors, process it, and then act on it, manipulating motors, arms etc. The key areas in robotics deal with:

- Control systems
- Kinematics
- Dynamics
- Computer Vision
- ROS
- Hardware-Software integration etc.

You can think of robotics as a combination of IoT, Motion, Autonomous Control, Control Systems.




IoT mainly focuses on data and connectivity. The IoT device must collect data, connect and send that data to the processor, which may happen through cloud, or using edge devices like the Raspberry Pi, where it is computed and analyzed. The main areas in IoT deal with

- Communication Networks like Wi-Fi, MQTTS, Bluetooth, Zigbee, LoRa etc
- Cloud Integration - Using cloud services like AWS, Azure to connect and compute data
- Dashboards - Analysis results and processes
- Edge Processing - devices doing low level computations with the device.

2. GETTING STARTED

The best way to step your foot in IoT is getting your hands dirty on electronics. Start with an Arduino, Get familiar with the sensors, and interface. Move up to ESPs, which opens the door to many other communication networks like Wi-Fi, bluetooth, zigbee. It also allows RTOS, which is great for low level computing. Then move up to Raspberry Pi. Do projects interfacing Raspberry Pi with ESPs and Arduinos.

3. REFERENCES / LEARNING RESOURCES

- Arduino for Beginner:
 Arduino Course for Beginners - Open-Source Electronics Platform
- Projects on Arduino:
<https://youtube.com/playlist?list=PL4g1oAdmuCfqmYvURLzVFkMMUI7839biN&si=CYezgsoAZXN3M2mB>
- ESP:
<https://youtube.com/playlist?list=PLWNDWPACIRVqNUluJylljkQfFSelPuxUi&si=FwiUDzIN6VxpgKh6>
- RTOS:
https://youtube.com/playlist?list=PLEBQazB0HUyQ4hAPU1cJED6t3DU0h34bz&si=rbDkeBuBQP_9aB2A
- Raspberry Pi:
<https://youtube.com/playlist?list=PLLSegLrePWgZBgQqDJvgZ4ewbpCnuare&si=pVE4VR-GCIRQ9YdL>
<https://youtube.com/playlist?list=PLGs0VKk2DiYxdMjCJmcP6jt4Yw6OHK85O&si=ts8cCjbnat12p-y>

BONUS TIP

Mainly, do projects on cloud computing, you won't have specific playlists on those, but you will be able to find video guides for your specific use cases. The projects that we do, with App/WebApp, ML integration mainly fall into IoT anyways. The sky is the limit! All the Best, Toodle-OO!

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