IoT Presentation

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11/30/2022

Learning Goals

- What is IoT.
- Applications of IoT.
- How to start a IoT project.
- How to finalize a IoT project.

What is IoT?

- The Internet of Things or commonly abbreviated as IoT is a term to describe the connection of physical objects with other physical objects and systems over the internet or other communication networks. These connections enable the objects to share and exchange data with each other.
- Some common IoT devices include Arduinos, Raspberry Pi's, and sensors such as temperature, humidity, pressure, proximity, level, accelerometers, gyroscopes, gas, infrared and optical sensors along with so much more.

Applications of IoT

- Some of you many not know but IoT is everywhere.
- For example, modern cars. They have all these sensors, chips and micro processors that share information with each other to enable basic and advance features such as auto lane keeping assist, auto high beams, auto parking, etc.
- Another example includes smart phones. Our smart phones have cameras, various sensors such as gyroscopes, accelerometers, etc., that all connect to each other. They can also be used to connect with other IoT devices such as smart temperatures, speakers, etc.

How to Start a IoT project

- With some basic electronic component knowledge, you can easily learn and start simple IoT projects.
- If you have good knowledge on electronic components, then you can easily start a IoT project by buying breadboards, wires, and the various components you want to use such as motors, sensors, LCD panels, etc., separately.
- If you have little or no knowledge, you can easily start by buying a premade kit of electronic components that come with a guidebook or a website. I recommend Elegoo because they have various kits and easy-to-understand guidebooks/websites.

Prototyping a IoT project

- After you make some basic projects with breadboards and such, you can continue farther if you want by making an actual PCB board for your project. Then you could potentially look to commercially sell your projects to customers.
- After completing your first breadboard prototype, I recommend practicing soldering on a practice kit because that is a helpful skill to learn.
- After getting the hang of soldering, I recommend using a prototyping PCB board because this will require you to solder the components on instead of just connecting components to the holes like the breadboards. And it will help you to use as reference for designing a custom PCB.

Designing a PCB

- Before ordering custom PCBs from a manufacturer, you will of course have to design them. That said, designing a PCB does have a bit of a learning curve so be warned.
- So first, you'll have to select which software to use. Some popular paid ones are Altium and Cadence. But there more suited to established business which is reflected on their cost. Altium is a whopping $460 a month.
- Or you can use free ones such as EasyEDA which contain a library of already made schematics that you can use and publish your designs to.

Ordering a PCB

- After you finished designing your PCB, you simply upload your schematic to a manufacturer that makes custom PCBs. Some manufacturers include JLCPCB and Digi Key.
- Then after your PCB delivers, all you do is solder the various components onto it then watch in anticipation as your IoT device works or it combusts and fries itself. Then you are forced to watch as all your hard work goes down the drain.
- Just like compiling code, not everything works on the first try. Failing is normal and a good learning experience on what not do next time. So, all you must do is get back up, figure out what went wrong, fix it and keep on redoing this process until your device works or your wallet begins to cry.

Summary

- IoT is the connection of physical objects with each other with data sharing in mind.
- IoT is everywhere like in cars and smartphones.
- Elegoo kits are an easy way to start learning about how to make IoT products.
- The path to make a finalized IoT product is clear but just like SWE, the processes is quite extensive, and failures are to be expected.

References

- What is IoT by Oracle.
- Internet of Things by Wikipedia.
- Seminar by Rohit Mashali