INTERNET OF THINGS (IOT)

What is IoT?

The Internet of Things, or "IoT" for short, is about extending the power of the internet beyond computers and smart phones to a whole range of other things, processes, and environments. Here's everything you need to know.

We all know that IoT is changing industries across the board – from agriculture to healthcare to manufacturing and everything in between – but what is IoT, exactly? Working for an Internet of Things (IoT) company, I get asked that question all the time and, over that time, I've worked hard to boil it down to something anyone can understand. Here's everything you need to know about the internet of things.

If you just Google “what is IoT?”, many of the answers are unnecessarily technical. Case in point:

“The Internet of Things (IoT) is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction.”

The Internet of Things (IoT) Explained: Simply and Non-Technically

How are you reading this post right now? It might be on desktop, on mobile, maybe a tablet, but whatever device you’re using, it’s most definitely connected to the internet.

An internet connection is a wonderful thing, it give us all sorts of benefits that just weren't possible before. If you're old enough, think of your cell phone *before* it was a smart phone. You could call and you could text sure, but now you can read any book, watch any movie, or listen to any song all in the palm of your hand. And that's just to name a few of the incredible things your smart phone can do.
Connecting things to the internet yields many amazing benefits. We've all seen these benefits with our smart phones, laptops, and tablets, but this is true for everything else too. And yes, I do mean *everything*.

The Internet of Things is actually a pretty simple concept; **it means taking all the things in the world and connecting them to the internet**.

Why IoT Matters

When something is connected to the internet that means that it can send information or receive information, or both. This ability to send and/or receive information makes things smart and smart is good.

Let's use smart phones (**smart** phones) again as an example. Right now you can listen to just about any song in the world, but it's not because your phone actually has every song in the world stored on it. It's because every song in the world is stored somewhere else, but your phone can send information (asking for that song) and then receive information (streaming that song on your phone).

To be smart, a thing doesn't need to have super storage or a supercomputer inside of it. All a thing has to do is *connect* to super storage or to a supercomputer. Being connected is awesome.

In the Internet of Things, all the things that are being connected to the internet can be put into three categories:

1. Things that collect information and then send it.
2. Things that receive information and then act on it.
3. Things that do both.

And all three of these have enormous benefits that feed on each other.

1. Collecting and Sending Information

This means sensors. Sensors could be temperature sensors, motion sensors, moisture sensors, air quality sensors, light sensors, you name it. These sensors, along with a connection, allow us to automatically collect information from the environment which, in turn, allows us to make more intelligent decisions.

On the farm, automatically getting information about the soil moisture can tell farmers exactly when their crops need to be watered. Instead of watering too much (which can be an expensive over-use of irrigation systems and environmentally wasteful) or watering too little (which can be an expensive loss of crops), the farmer can ensure that crops get exactly the right amount of water. More money for farmers and more food for the world!

Just as our sight, hearing, smell, touch, and taste allow us, humans, to make sense of the world, sensors allow machines to make sense of the world.

2. Receiving and Acting on Information

We're all very familiar with machines getting information and then acting. Your printer receives a document and it prints it. Your car receives a signal from your car keys and the doors open. The examples are endless.

Whether it's a simple as sending the command "turn on" or as complex as sending a 3D model to a 3D printer, we know that we can tell machines what to do from far away. So what?

The real power of the Internet of Things arises when things can do both of the above. Things that collect information and send it, but also receive information and act on it.

3. Doing Both

Let's quickly go back to the farming example. The sensors can collect information about the soil moisture to tell the farmer how much to water the crops, but you don't actually need the farmer. Instead, the irrigation system can automatically turn on as needed, based on how much moisture is in the soil.

Your Takeaway Definition of IoT

What is IoT?*: The internet of Things, or "IoT" for short, is about extending the power of the internet beyond computers and smart phones to a whole range of other things, processes, and environments. Those "connected" things are used to gather information, send information back, or both.*

Why does IoT matter?*: IoT provides businesses and people better insight into and control over the 99 percent of objects and environments that remain beyond the reach of the internet. And by doing so, IoT allows businesses and people to be more connected to the world around them and to do more meaningful, higher-level work.*

WHAT WE DO IN OUR IOT APPLIED LAB

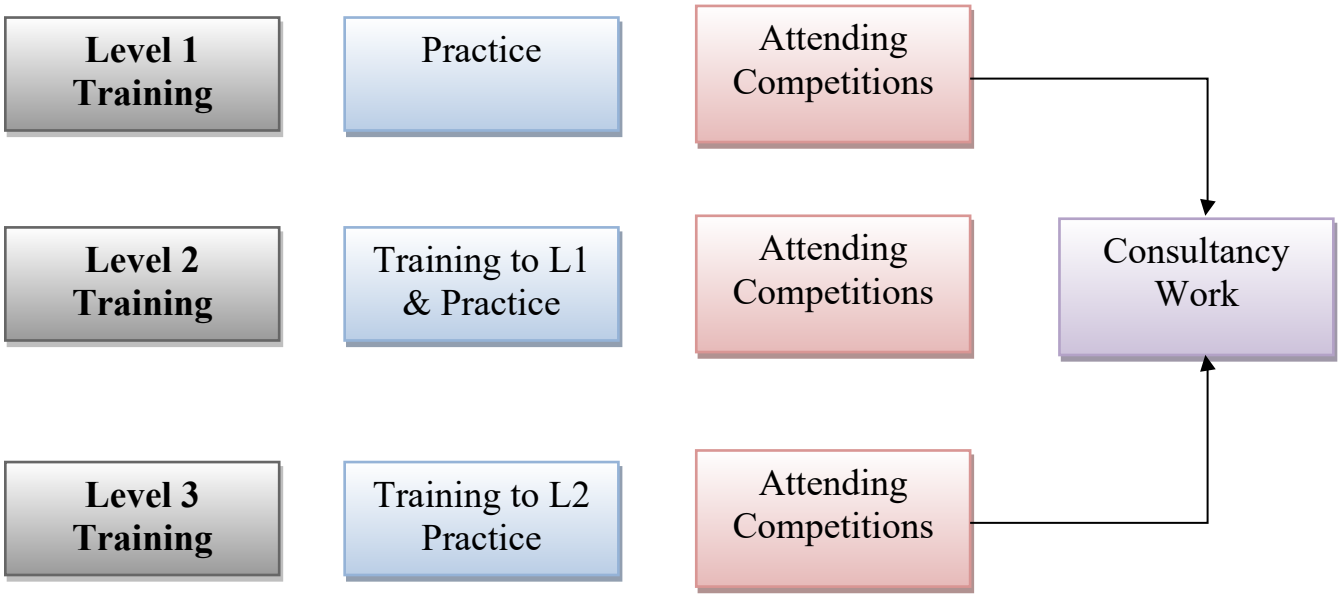
OBJECTIVES:

- To provide Technical training to students in the area of Internet of Things
- Motivate and guide students to participate in competitions
- To take up industry defined problems and provide solution
- To take up consultancy work from industries and generate revenue for developing the laboratory
- To provide placements for the students through the applied lab.

FOCUS AREAS:

- Internet of Things
- Embedded Systems

ACTIVITY FLOW DIAGRAM:



The Lab Activities can be divided in to 4 phases:

- **Training Phase**
- **Practice Phase**
- **Event Participation Phase**
- **Handling Consultancy Phase**

Trainings for lab members will be given in three different phases.

- Basic Level
- Intermediate Level
- Advanced Level

Level 1 Training (Basic Level)

- Initial Basic Level Trainings will be given to the students who join in the IoT Applied lab by the existing students available in the laboratory this training will be on 8051 Microcontroller and Arduino. Normally students those who join in the first year will be in this phase. If any particular student in this case have a strong idea about his phase will be assessed based on a project and will be transferred to the level appropriate to him.

Level 1 Practice Phase:

- During the practice phase the students will be given with the necessary hardware and workbenches do that they do hands on practice until they are confident enough in the level 1 training.

Level 1 Competition phase

- In this phase students will be permitted in participate in symposiums, mini project expos and other internal competitions.

Level 2 Training (Intermediate level)

- This training will be on advanced level boards such as ARM boards and Raspberry pi and other IoT enabled boards. This training will be provided to the students by the faculty in-charge responsible for the IoT applied lab.

Level 2 Practice Phase

- Level 2 practice phase the students will be given with the necessary hardware and workbenches do that they do hands on practice until they are confident enough in the level 2 training. During this practice session the students will have to take the responsibility of training the level 1 training students.

Level 2 Competition Phase

- In this phase students will be permitted in participate in Conferences, Project Expos and project presentations organized by IIT, MIT and other leading government and NIRF ranking institutions.

Level 3 Training (Advanced Level)

- In this level in order to cater the industrial standards students will be provided with advanced level training by external vendors and industrial experts. The students who complete this training will have the capability to get placed in any CORE IoT based Company and he will have the capability of taking consultancy works and become entrepreneur.

Level 3 Practice Phase

- In this phase students will be mostly doing their hands on practice and during this phase student will be doing his/her final year so that their academic projects will be carried out simultaneously in the field of IoT and students in this phase will take the responsibility of train the level 1 and 2 students. The other major works in this practice phase is preparing necessary documents on the consultancy project which is to taken in the next phase.

Consultancy phase:

- In this phase students will be working on various consultancy works taken by the laboratory. For this phase the students from all the levels will be involved and it will be monitored by the Faculty in-charge and the level 3students. This consultancy work will be carried out in order to develop the laboratory and a part of amount will be given as a stipend to the students who involve in the consultancy work.

(Glimpse of IoT Lab Progress in 2019-2020)

Winners in the following event:

1. First Prize in **ISRO Model Making Competition**.

Students Presenting the model to ISRO Scientist

Winning Certificate of ISRO Model Making Competition

2. First Prize in **Project EXPO** at **Kongu Engineering College**, Erode.

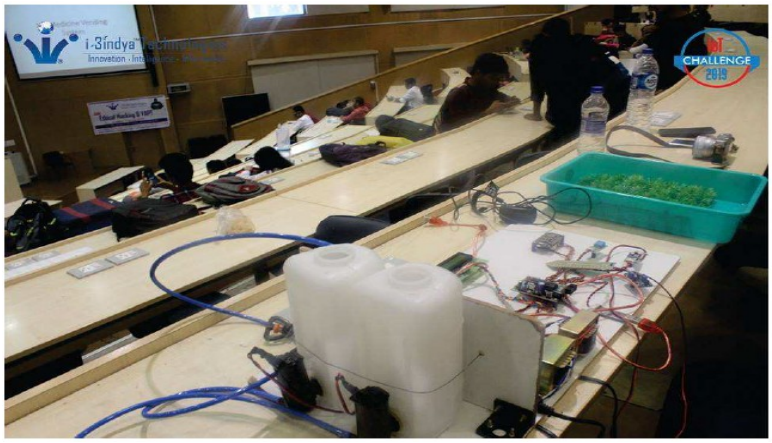
3. First Prize in **Project Presentation** Competition in **VOC Government Engineering College** Thoothukudi.

4. First Prize in **Idea Presentation** at **National College of Engineering**, Kovilpatti.

5. First Prize in **Project Presentation** at **Government Engineering College**, Tirunelveli.
6. Winners in **Texas Instruments Online contest** on Digital Electronics.
7. Winner in **Texas Instruments Online contest** on Electronic Devices.
8. First Prize in **Project Expo** held at **Sri Vidhya College of Engineering**, Virudhunagar.

Participated in the following Competitions:

1. **IoT Challenge 2019** at **RADIANCE - IIT Mumbai. (Finalist)**



2. **IoT Challenge 2020** at **AAKAR - IIT Mumbai. (Finalist) - Postponed**
3. **Project Expo** at **Velammal College of Engineering**, Madurai.

Photograph of the model developed

4. **Project Expo** at **SRM University**.

Students Presentation in SRM University

5. **Daksh 2020**, **Hackathon at Sashthra University**, Thanjavur.

Product developed by our IoT Applied Lab students (Smart Rain Gauge)

6. **Quarter Finalist** in **Texas Instruments "India Innovation Challenge Design Contest - 2019**"
7. **Shortlisted in Internal Smart India Hackathon 2019 & 2020**.
8. Participated in **Project Expo** at **Muthayammal college of Engineering College**, Nammakal.

Other Activities:

- IoT Applied Lab Students was invited as a **Resource Person** for training the **Sri Jeyendra Golden Jublee school** students on **Arduino** and **Raspberry Pi**.

- **District captain of Entrepreneurship Development and Innovation Institute** selected by **Anna University Regional Campus** and trained many school students in various innovation activities.


ATAL
TINKERING LAB
Hello, beauty!