INTERNET OF THINGS (IOT) INTERNSHIP
8 Days 70* hours Intensive Certified Internship
India’s biggest ever course work based Internship on
Internet of Things (IoT) & Industry 4.0 Technologies

Internship Structure
No of Days: 8
No of Hours: Total 70 (50 Hands-On Training Hours) + (20 Hands-On Project Hours on Project Assigned)

What is Internet of Things (IoT)?

The Internet of Things (IoT), is the network of physical objects or things embedded with electronics, software, sensors, and connectivity to enable objects to exchange data with the production, operator and/or other connected devices. IoT helps in developing smart real-time industry and domestic applications involving safety, ease of usage, time criticality, entertainment and comfort with the help of Embedded, electronics, software, sensor and communication technologies so it opened up lot of career/entrepreneurial avenues for those who are studying electronics, instrumentation, computer science and IT engineering. This program will introduce you to the world of IoT technologies and equip you to identify the potential problems and provides a better platform to bring technological solutions. The Internship provides hands-on training to effectively use and customize sensor networks, user interaction modules, data management and device interactions. Participants will understand the essentiality of inter-connected devices through wireless sensor networks and minimize human efforts. Students will get an overview of application deployment the process involved.

Technologies you learn

• Raspberry Pi & ESP 8266 and ESP32
• IoT with Machine learning Using Python & Tensorflow
• Cognitive Computing with IBM Watson
• Cloud Platforms – Particle Cloud & UBIDOTS
• Protocols – MQTT, MODBUS
• Firebase – Realtime Database by Google
• Embedded C & Python
Day 1: IoT Landscape, Introduction to various allied technologies & Team Formation.

Introduction to IoT & Industry 4.0
• What is IoT - In-depth explanation
• IoT Applications in different domain – Commercial and Industrial IoT
• How large is the IoT Market in different domains?

Introduction to various allied technologies
• IoT Elements
• Sensor Interfaces
• Sensors and Actuators
• Cognitive Computing
• IBM Watson
• Cloud Platforms
• Real time Database
• IoT Protocols
• Software Development
• Nodes
• Gateways
• Communication Modules – Wired and Wireless
• Servers

Team Formation - Problem Statement Allocation
Internet of Things related industrial problems/Opportunity area will be allocated to participants. Participants will work in a team and present the solution to Industry panellists.

DAY 2: Introduction to Industry 4.0 & Smart Factories
• Introduction about Industry 4.0
• Introduction to existing Industrial Control systems
• Internet of Production (IoP)
• Cognitive learning and HMI
• Smart Factory of 2020
• Industrial Internet
• Predictive and Preventative Maintenance of a Machine
• Tracking the utilization and productivity of the machine
• Energy and cost optimization of manufacturing plants
• 3 layered architecture of Big Data - Physical (Sensors), Communication, and Data Intelligence
Machine-to-machine (M2M) communication
- IoT platforms
- Creating sensor network with Wireless protocols
- Security in IoT

IoT and Industrial IIoT Standardization
- IoT architectures
- Cyber-physical systems

**Day 3 and 4: IoT technology tools with Hands-on Practical**
- ESP Programming
- ESP Sensor Interfacing
- Novel IoT Protocols – MQTT
- Connecting to an Access Point using ESP
- Dual Modes of ESP
- Configuring an ESP
- Data Acquisition and Transfer
- Java based Data Management
- Connecting to IoT Platform – UBIDOTS
- Connecting sensors and Exchanging data
- Connecting to Real-time Cloud Database and Storing Data for future use.
- MQTT protocol for Communication between devices and software.
- Sensor Configuration
- Various sensors used in IoT applications
- Raspberry Pi
- R-Pi Architecture
- R-Pi based Gateway Creation
- Connecting R-Pi with IoT Platform – Particle cloud / UBIDOTS
- Connecting Real-time Database with hardware/sensors.
- MIT App Inventor
- MIT App Inventor Interface with Real time Database using IoT Protocols
- ESP Controller interface
- Data Transfer between Mobile and Controller
- Processing based Arduino application development
Day 5: Cognitive Computing Using IBM Watson & Analytics

- Predictive Analytics using IBM Watson
- Cognitive learning with IBM Watson
- Hands-on experience working with IBM Watson
- Making machines take intelligent actions using Data

Day 6 and 7 - Hands-on Lab with live projects & Demo
Participants will get a chance to do various real time IoT applications using various hardware available. Hardwares like Aurdino, Rasperry Pi, Bluetooth or wireless modules and various sensors.
IoT based startup Ideas
Entrepreneurship – Starting IoT based product/services Company.

Day 8 - Project Presentation
Solution/Project presentation – Peer to Peer learning Day – Learn from your other fellow participants about the projects they are working on and vice versa.
- Best Teams will be selected and awarded “Winner of IoT Summer'19” with prizes.
- Best Students who perform well throughout the Program will get “Best Intern Award” and certificate of Excellence.

Program Benefits
After the program the students should be able to:
- Understand IoT landscape and all emerging areas to develop products
- Understand and build IoT applications
- Understand and build Industry 4.0 Applications
- Work on Cognitive computing with IBM Watson
- Work on Various Industrial Protocols and understand them.
- Implement concepts of UI, data handling and control instructions
- Use native android applications for device control
- Develop processing based interaction modules for controllers
- Develop WSN using ESP
- Deploy IMU in multi-dimensional applications
- Emulate real time IoT application sequence
- Work on safety and automation tasks in daily life
• Conceptualize and develop products using IoT
• Develop confidence of presenting their project/Product
• Inclination towards entrepreneurship and business opportunities

Note: Expertshub has all rights to change the structure of the program based upon expert’s availability, equipment’s availability & lab conditions available at host institutions without prior notification to anybody.
*no of hours mentioned are calculated by both class room training & the time student spend outside the class room for their project work

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