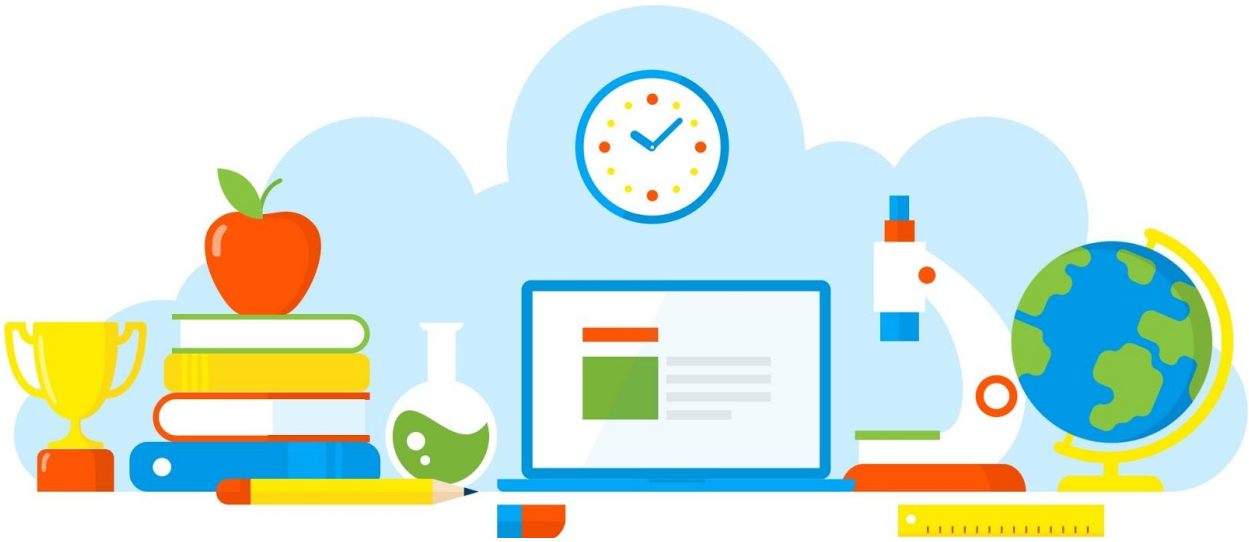

Internship Report

National Institute of Technology Andhra Pradesh

Aman Kumar Dewanagan
National Institute of Technology Raipur

25th May, 2020 - 31st July, 2020

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Respected Sir,

I am really glad to have such a wonderful experience working at your esteemed Institute of National Importance. It was an amazing experience working throughout the duration under the guidance of Dr. Sankar Peddapati(Assistant Prof. at Electrical Engineering Department, National Institute of Technology Andhra Pradesh). He guided me throughout the whole duration of the internship and helped me think in a deeper and wider perspective as a user. He let me focus on developing monitoring devices for patients that are cheap, inexpensive and concise with long lasting power, so that it can be used in current scenarios for monitoring of patients in remote areas and for people living in Home Hospitalization for regular checkup. This solution would be really great for use in the current scenario of the COVID19 pandemic. I would also thank the Institute for providing this Online Internship opportunity to students from all around the country amid this pandemic.

Thanking You

Yours Sincerely

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About Institute:

National Institute of Technology Andhra Pradesh is an esteemed Higher Education Institute of National Importance. It was established in the academic year 2015-2016. The Institute has done a lot of major development in the previous years. The institute has a vision to achieve excellence in technical education by imparting world class teaching and best practices of research, consultancy and outreach activities and promote Engineering out new Solution to current day problems of real world by utilizing there technical knowledge in various courses. The Institute secured 200th rank in NIRF Ranking among all Engineering Colleges.

Roles and Responsibilities:

I worked as an Intern in the Electrical Department, National Institute of Technology Andhra Pradesh. I was responsible for working out an IoT based Solution for medical service and allowing doctors to keep check on patients remotely. I was responsible for focusing on the Embedded IoT and Web Development part for collecting patients data, transmitting it to the Cloud and showing it at the website frontend.

Overview of Internship Experience:

At the initial stage the tasks appeared to be quite tough, as the COVID19 was spreading like boom and everything was brought online, at the initial stages there was a lot of work lagging out, lack of instruments and technical requirements, but with the time the encouragement within helped me cope up such problems and my interest on IoT took over all the drawbacks that occurred.

I started working over the work that has been previously done throughout time, i went through a no. of research papers and made a concise short solution to this problem that can be solved with ease.

I decided to develop an IoT Healthcare Web Interface for patients, hospitals, and care centers that regularly monitor the health condition and check whether the patient is stable or not or if he/she needs to be admitted to the hospital. The proposed work monitors the patient's body conditions such as pulse rate, and body temperature, etc, on a real-time basis. Such information will be used by the doctor to diagnose the patient remotely and guide the best prescription treatment.

Further, the MedIoT system apart from collecting the data ensures that the patient has taken the medicine on time, it is a box-type small system equipped with the Internet ofThings (IoT). For the proposed system we have used Wi-Fi Technology to send sensor data to a Smartphone and also to the Cloud Service Platform for archiving and study. The information available on the Cloud can be observed by the doctor by using a Mobile application or Web Portal. The mobile application also supports the scheduling of medicines as per the doctor's prescription. The overall system developed, to the best of the author's knowledge, is low cost, effective,and service-oriented as compared to the traditional healthcare practices and other e-Health solutions reviewed.

MedIoT is a IoT based Real-Time Health Monitoring System connected to the cloud that let's the users keep real timecheck on some basic parameters Heart-Rate, Blood Pressure, Temperature, ECG Function, Glucose Level, Dissolved Oxygen Level using Biosensors and then transmitted on cloud for storage over a website hosted using

Raspberry pi. This will transmit the data to ThingSpeak/Firebase for storage in the database and henceforth can be accessed by the authenticated person.

Skills Learnt and Used:

- Raspberry Pi
- Python
- Arduino
- Firebase
- Flutter
- ThingSpeak
- CAD
- Heroku
- Internet of Things
- Micro- controllers
- Electronics

Arduino: Collecting data from sensors and framing up the internal structure of the data collected.

Micro-controllers, Electronics and IoT: Connections to transmit data between different electronic components, analog to digital conversion and connecting all sensors and keeping voltage level and logic level consideration for proper data streaming and reliable connection.

CAD: For developing prototype of the final product look for casing

Heroku and Flutter: To show out data at some good looking Interface so that data can be shown in a reliable manner.

ThingSpeak and Firebase: To keep data at cloud, and backend database for the website to record real time data and to produce Web charts.

Python and Raspberry Pi: Raspberry Pi allows us to communicate with IoT in a better manner and eases the processing and uploading task, and allows the site to be hosted. It can be programmed using Python.

You can refer to the following Link for Work done during Internship: Documentation of Work

Conclusion and Experience:

National Institute of Technology Andhra Pradesh has successfully introduced me to the innovative project based on the Internet of Things(IoT). I realized that I needed to develop confidence in Embedded IoT and Web Development. It would be preferable if I finished doing work at a faster pace, as working with hardware and integrating it with Website was time-consuming. I must have also added some deep-learning models to the same by attaching a Raspberry Pi Camera to detect for symptoms of disease using OpenCV and other Machine Learning Techniques.

In conclusion, I believe I learned a lot from my supervisors and about IoT and Web Development in general.


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