ABSTRACT

During the 8 weeks of my Internship, I was involved in various sub-projects related to the main title. The overall goal of the project was to develop an efficient, fast, durable and secure system to interface with the user as well as IoT-Hardware which repeatedly charges and discharges some batteries. The hardware also consists of sensors which measure various parameters like, Voltage, Current, Internal Resistance, temperatures at various points and date-time. These sensors are read by a small microcontroller that formats the data and sends it to a server using a secure channel. The server then processes it and acknowledges the receipt of the data.

Technical Highlights of the project:
- NginX as the primary Web Interface
- MySQL as the primary Database
- Flask, a micro-web framework written in python as the Webserver
- Celery, an Asynchronous task worker
- RabbitMQ, a Message Queue which stores the upcoming jobs
- SciKit Learn, a Machine Learning Package
- SQLAlchemy as the Object-Relational-Mapping for the Database
- Amazon Web Services, a Cloud Computing Platform
- Boto3, a Python Wrapper to Interface with AWS
- RESTful API

The data received from the battery, needs to be quickly inserted into the database table and some calculations like Power, Internal Resistance and some machine learning to predict the life of the battery needs to be performed. These results need to be stored again for future reference and should be appropriately formatted in order to store the data for future use. However, the challenge in this is the volume of data that is generated and some asynchronous properties of the data was used in order to satisfy the requirements.