CarbonFootprint-API

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Education

University: Chitkara University, Punjab
Degree: Bachelor of Engineering - Computer Science
Expected Graduation Year: 2020

Courses and Performance:

Course Taken	Grade
Operating System	O
Computer Networking	A
Database Management System	A
Object Oriented Programming	O
Introduction to Linux	O
Algorithm Design and Implementation	O
Advanced Programing Concepts	O

Abstract:

Enhancing the CarbonFootprint-API to add and refactor new functionalities like:

- Writing more test cases related to the API.
- Displaying the daily user emission data in form of heatmap in the profile page.
- Enhance the UI/UX of the profile page. Increasing the user interactions.
- Allowing the user to add daily activity to calculate emissions.
- Use the latest version of react and shift the code to create-react-app which will help in creating stable and small size production builds.
- Adding swagger(documentation app), which will improve how a user will learn and interact with the API.

Current Status of the project:

- Current API explorer doesn't help a first time user to make API calls because he have to enter all the data by himself. This is solved by swagger as it lets the user to send API requests directly from the documentation page without any prerequisites.
- Tests which are written currently do not cover all the different API requests.
- User interaction is low because of no user side functionality. Adding features which a user can use daily can increase the interaction time of the user.
- I'll
- We are not using latest react version plus production react build is also not efficient. We should use react-scripts to build frontend react build files.

Project Goals:

1. The aim of this project is to give users access to the CarbonFootprint emission data so that they can create applications to make people aware of the adverse effects of their daily activities. The idea of letting people see their CO2 emissions on travelling via different maps services is really unique and exciting.
2. By providing user the interface alongside the API will help overcoming the ignorance of the general public of how their little doings is increasing the Carbon Dioxide generation.
3. I believe CarbonFootprint Project really has a great potential to reach out to the community of people who want to do good for the planet and also rise awareness among the rest of the population.
4. I would like to enhance the quality of the code written and also how end user interacts with our platform.
5. I would also like to improve how the code is tested and deployed.

Technology Stack:

1. ExpressJS (API endpoints)
2. ReactJS (Client side)
3. Swagger (Documentation)
4. Sinon, mocha and supertest (Testing)
5. Docker (Deployment)

Timeline:

GSoC is about 12 week duration, with about 20 days of community bonding period in addition. I will be spending 60% time in sorting out the bugs left out in the current version of the app, improving previous written code along with new functionalities, and rest of the 40% in writing tests and documenting the API as well as the code.

The detailed timeline is discussed below:

Community Bonding Period

May 06 - May 10

- Requirement gathering and documentation

May 11 - May 14

- Interact with the community, provide and take feedback from fellow contributors.
- Finalise the decisions of the work I have to do.

May 15 - May 27

- Break for semester final exams.

Blog posts on starting my GSoC and How I started planning for GsoC

Phase I Evaluation

May 28 - Jun 10

- Re-configure the client directory and shift to **create-react-app**.
- Also update the version of react to 16.8
- Edit all the react files accordingly and make sure everything works same.

Jun 11 - Jun 15

- Set up build scripts for client side to work accordingly with create-react-app and configure CI.

Jun 16

Celebrating birthday with contributions to GSoC.
Best birthday ever! 🥳🥳🥳

Jun 17 - Jun 28

- Work on completing the new profile page.
- Add all the ways a user can enter his/her daily activities and count emissions using drop downs in the modal.

Blog post on how tests can help make contributions maintainable for Open Source.

Phase II Evaluation

Jun 29 - Jul 10

- Start writing unit tests for the services and controllers using **mocha** and **sinon.**
- Writing integration tests at API level using **supertest.**

Jul 11 - Jul 18

- Continue the work done in **swagger** for docs and exploring the API endpoints.

Jul 19 - Jul 26

- Adding a landing page for developers who want to use the API and explain the details about using it.
- Also add a link on the landing page which will lead to the newly created swagger documentation.

Blog post on how we can increase the API response time by caching (using redis)

Final Evaluation

Jul 27 - Aug 07

- Start strategizing how code is deployed and look to the options available to advance the DevOps of the project.

Aug 08 - Aug 18

- Containerize the API server using docker and discuss the idea of using kubernetes for orchestration of the application.

Aug 19 - Aug 26

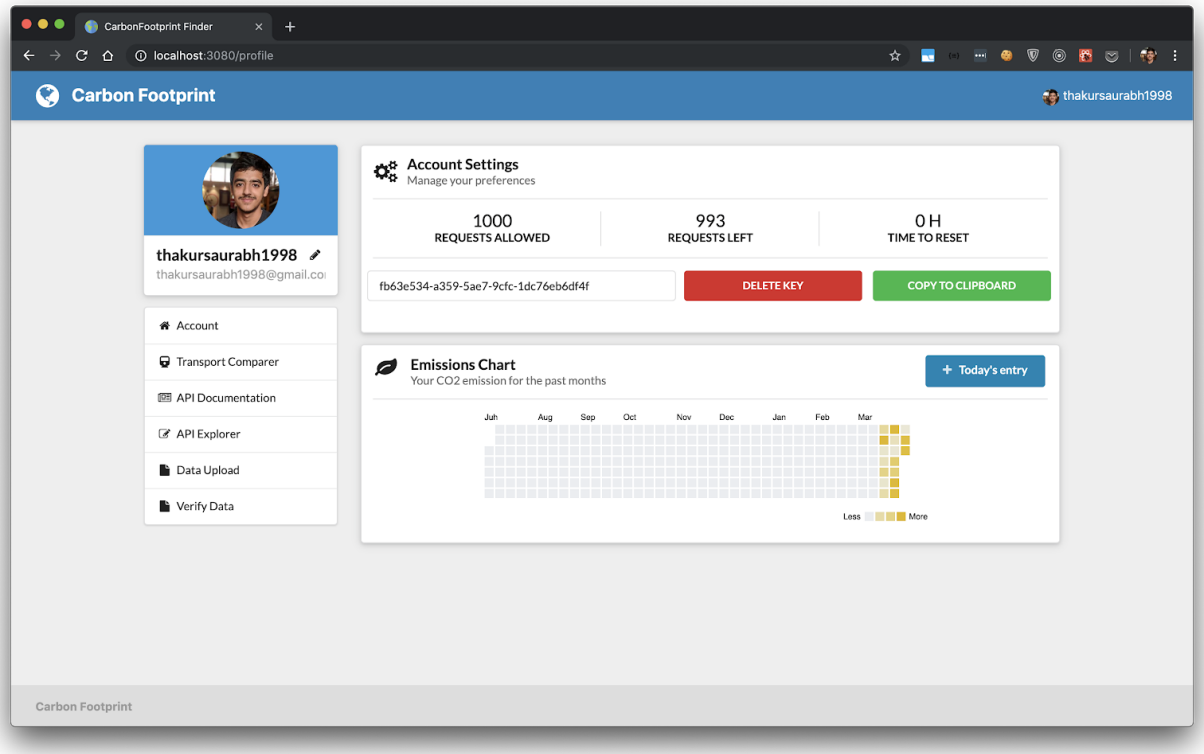
- Updating documentation/wikis adding up all the work I did and why the changes were made and how it affected the project.

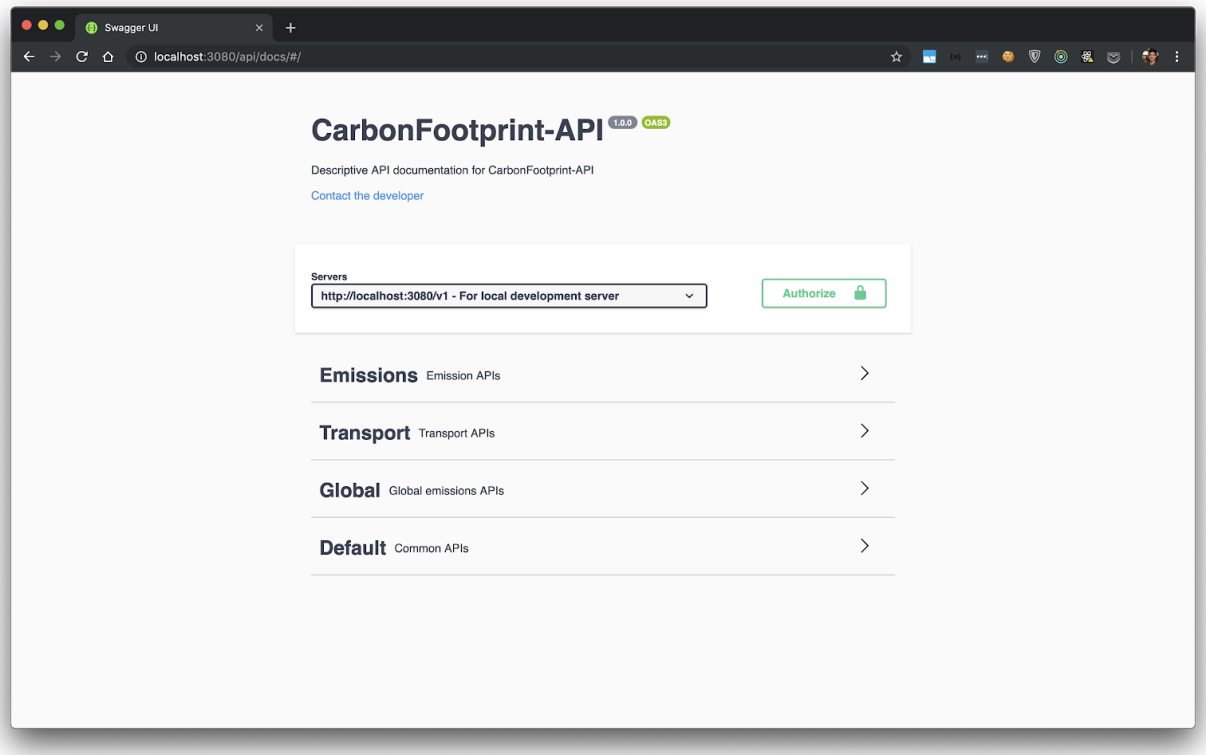
Blog posts on GSoC Experience and Writing Documentation

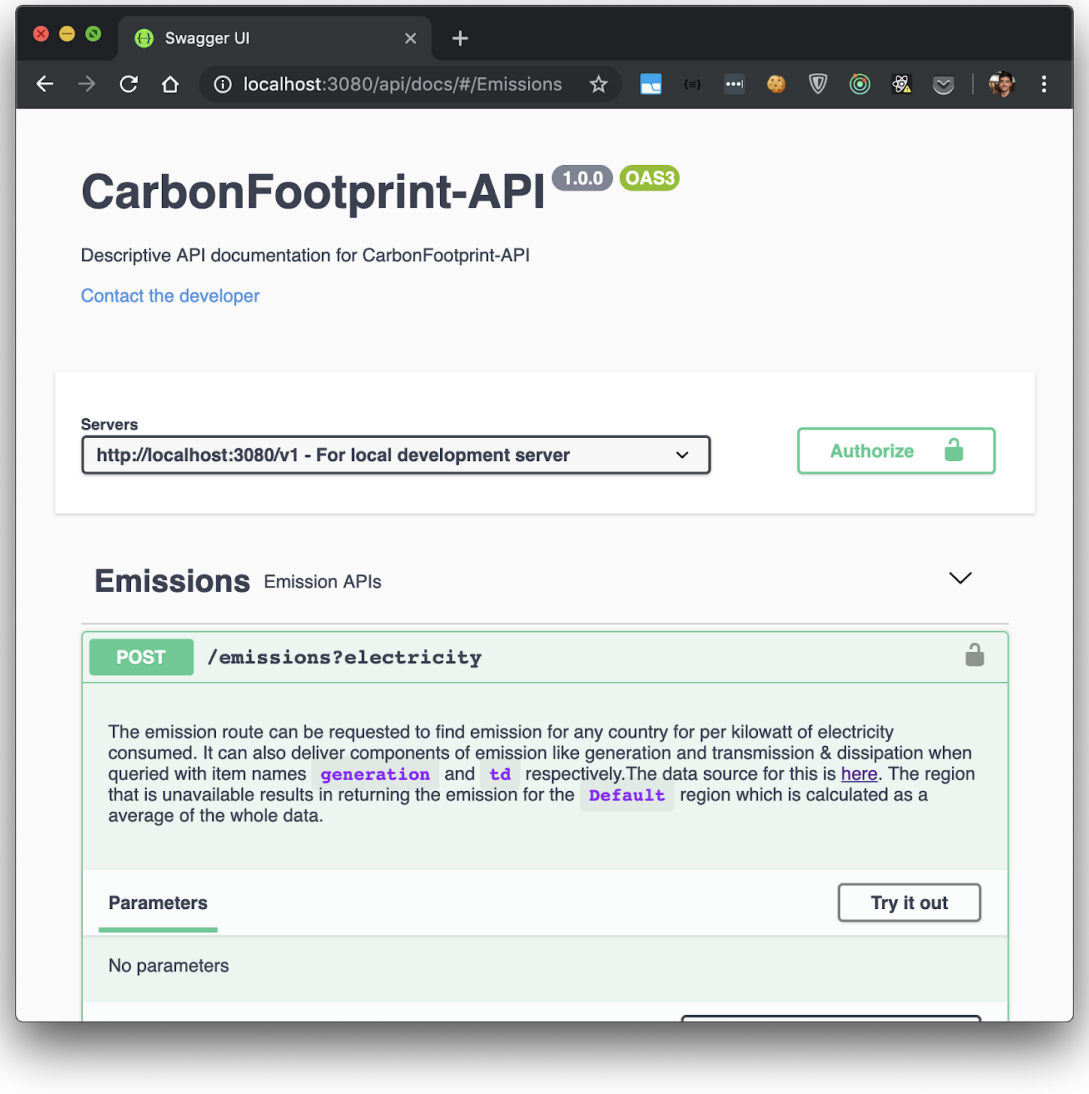
End Results

The API will be more optimized and will be more usable by developers and general public by the end of the summer. The new features will be tested rigorously to provide high quality API and data for any project.

UI Mockups:


CarbonFootprint Finder
localhost:3080/profile
Carbon Footprint
thakursaurabh1998
thakursaurabh1998
Account
Transport Comparer
API Documentation
API Explorer
Data Upload
Verify Data
Account Settings
Manage your preferences
1000
REQUESTS ALLOWED
993
REQUESTS LEFT
0 H
TIME TO RESET
fb63e534-a359-5ae7-9cfc-1dc76eb6df4f
DELETE KEY
COPY TO CLIPBOARD
Emissions Chart
Your CO2 emission for the past months
Today's entry
Jun
Aug
Sep
Oct
Nov
Dec
Jan
Feb
Mar
Less
More
Carbon Footprint


Swagger UI
localhost:3080/api/docs/#/
CarbonFootprint-API
1.0.0
OAS3
Descriptive API documentation for CarbonFootprint-API
Contact the developer
Servers
http://localhost:3080/v1 - For local development server
Authorize
Emissions Emission APIs
Transport Transport APIs
Global Global emissions APIs
Default Common APIs


Swagger UI
localhost:3080/api/docs/#/Emissions
CarbonFootprint-API
1.0.0
OAS3
Descriptive API documentation for CarbonFootprint-API
Contact the developer
Servers
http://localhost:3080/v1 - For local development server
Authorize
Emissions
Emission APIs
POST
/emissions?electricity
The emission route can be requested to find emission for any country for per kilowatt of electricity consumed. It can also deliver components of emission like generation and transmission & dissipation when queried with item names generation and td respectively.The data source for this is here. The region that is unavailable results in returning the emission for the Default region which is calculated as a average of the whole data.
Parameters
Try it out
No parameters

About Me:

I am a 3rd year undergraduate student pursuing my degree in Computer Science and Engineering from Chitkara University, Punjab, India.

I am a full stack web developer and have worked on many projects. I also have experience working with ethereum blockchain.

I am an open source enthusiast and my work can be found at github and gitlab profiles.

I also love participating in hackathons, and have won quite a few of them including **Call for Code Global Hackathon conducted by Topcoder and IBM**.

Previous Projects:

- **Blockchain Certificate Generation (Ethereum, NodeJS, React, Docker)**

  Generation and storing verified certificate serial numbers with signature of issuing authority in Ethereum Blockchain to validate the origin and time period of the certificate. This project makes you 100% sure that you have an authentic certificate.

  This project was **made part of an open source organization named Yogdaan** as they really liked the idea and wanted to take the project forward.

  Checkout the project here.

- **NGO - Helper (NodeJS, React, Heroku)**

  Decentralized app for making **donations**. An app where donors and people in need can get together directly. All the donations are managed with a blockchain in a decentralized manner. Each transaction made is saved in the blockchain hence working as a public ledger.

  Checkout the project here.

- **EndPrep (Django, jQuery, Google Compute Engine)**

  EndPrep is a notes sharing web app. The main motive of this project is notes sharing. Students can upload and share notes. All the data gets uploaded and stored to the server. Students get a link through which they can directly share the documents with their peers.

  Checkout the project here.

My timezone is GMT +5:30 and I can devote 35 - 40 hours per week to the project. Apart from this I can also post blogs highlighting the development of my projects.

My contribution to the AOSSIE's CarbonFootprint-API repository as of November 2018 are:

Merge Request	Title
!124 [open]	lifecycle methods updated (link)
!125 [closed]	updating yarn package (link) The issue was resolved in MR 139 (link given below)
!126 **[merged]**	URL changes in documentation and ajax requests (link)
!127 **[merged]**	Fix wrong links (link)
!134 **[merged]**	Improve responsiveness of profile page (link)
!138 [open]	User's daily activity collection and CO2 emission visualization (link)
!139 **[merged]**	Google maps API dependency removed and Microsoft Bing Maps API added (link)
!140 **[merged]**	pipeline error fix, correction in assertion value (link)
!141 **[merged]**	Documentation change: adding gitlab env config (link)
!143 [open]	Initialized swagger (link)
!144 **[merged]**	Region value changed to default (link)

Check Merge Requests in Gitlab

Check Issues created in Gitlab

I am sure I will be able to meet the requirements and dedication this project needs. I will communicate effectively with my mentor and receive any criticism open heartedly. I would love to be a part of the project and contribute even if I am not selected for the program, I definitely will try my level best to make this project successful and will love to keep working with AOSSIE's other projects even after the summer.

Looking forward to work with you.

Thank you so much.

Regards

Saurabh Thakur