# Develop and deploy of the web app:

http://renewablefinland.cs.aalto.fi/

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renewablefinland.cs.aalto.fi

# Wind Power Map of Finland

Upload a load process profile which is a list stored as json file: Choose file No file chosen

Time granularity of the process (min):

Submit

Waiting for new process

Visulize the process

## Visulized Load Process

No process yet...

## Generated Map

# Frontend: HTML,CSS,JavaScript



- **Frontend user interfaces is developed by using the framework React.js**
- **Google map API is used to generate the map**

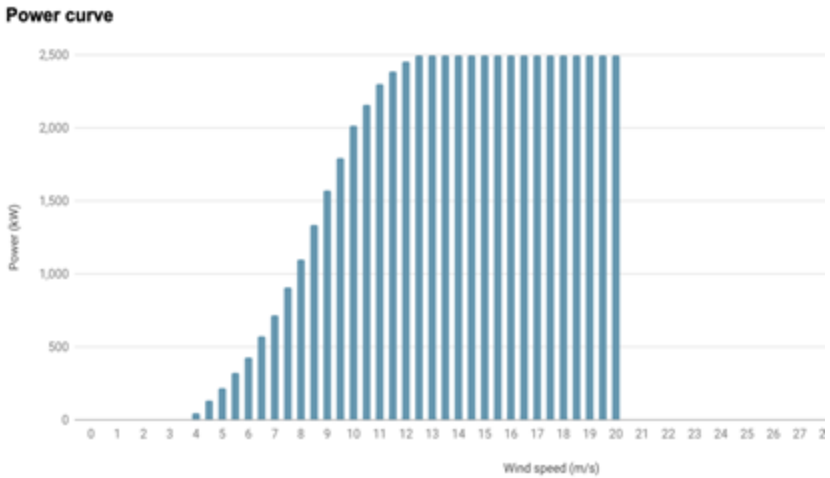
```
import GoogleMapReact from 'google-map-react';
```

# Development

## Backend: Python

FastAPI

python




```python
@app.post("/process")
async def upload_process(file: UploadFile = File(), timegran: str = Form()):
    # The load process file uploaded from browser
    with open(file.filename, "wb") as buffer:
        shutil.copyfileobj(file.file, buffer)

    # Load the process from the uploaded file
    with open(file.filename, "r") as f:
        process = json.load(f)

    # Compute the workable fractions at FMI station locations
    workable_fractions = get_fractions_FMI_parallel(
        process=process,
        battery_capacity=1000,
        time_granularity_process=int(timegran),
        time_granularity_wind=10,
        step_size=10
    )

    # Return the processed workable fractions
    return workable_fractions
```

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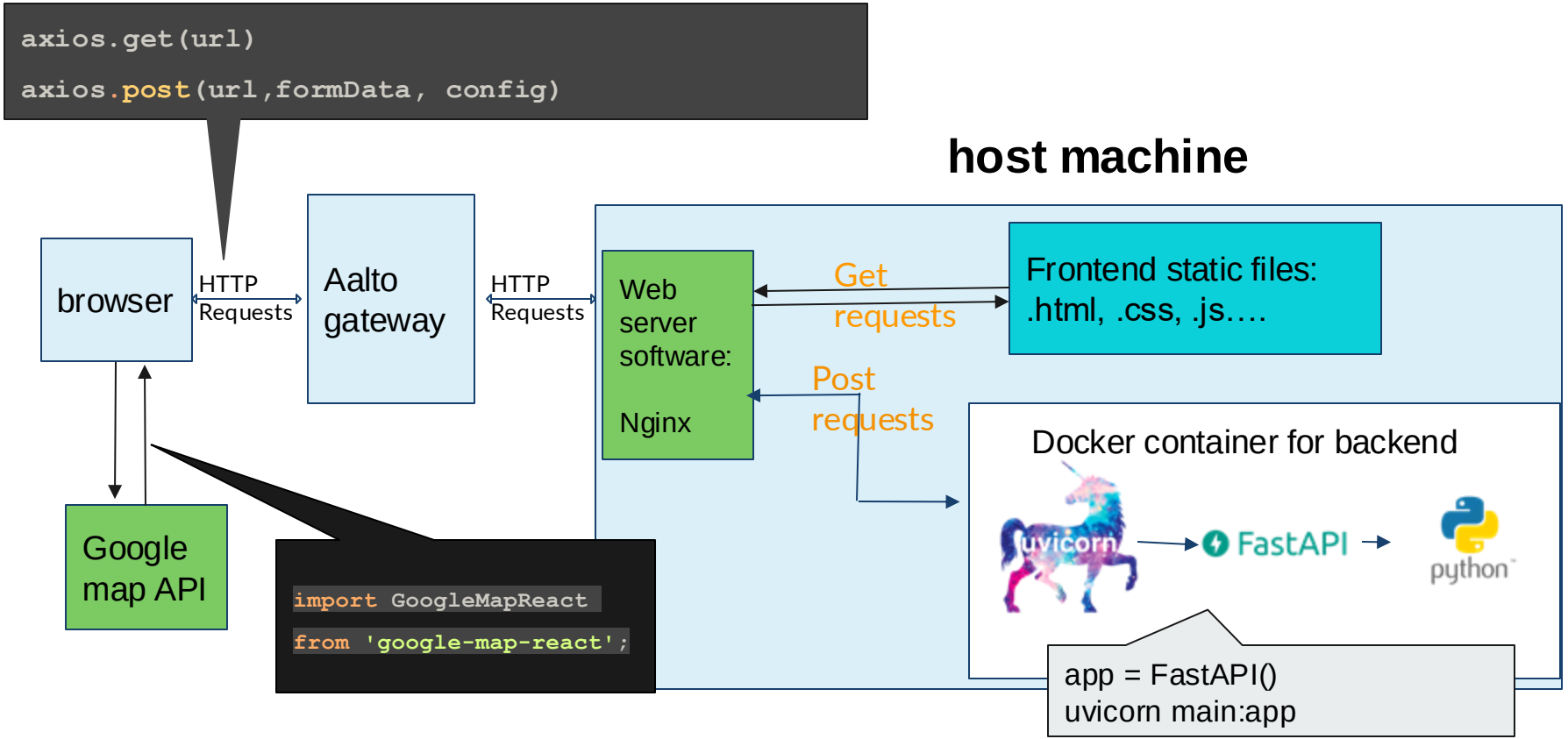
# Server deployment

1. Test everything locally.
2. Set up the web server’s environment,  install web server software(Nginx), Docker, etc.
3. Build the source code of frontend to static files and upload them to the web server (host machine).
4. Upload backend source code  to the web server and containerize it with Docker.
5. Configure Nginx to serve the frontend files, set the appropriate directory root to the location where frontend build files reside.
6. Configure Nginx to act as a reverse proxy to forward requests to the backend by specifying the backend's IP address or domain name and port.
7. Test the deployed web app, access the web application by entering the server's IP address or domain name in a web browser.

# Server deployment

URL: Renewablefinland.cs.aalto.fi IP: 130.233.195.55



# Future work

- More input options: turbine type, battery capacity, etc.
- Data format: support more data format.
- Security: protect sensitive user data.
- Leverage the asynchronous features of FastAPI and Python to handle multiple requests simultaneously without blocking, if needed.