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Embedded Systems

Repository Links

1. Telemetry
 - a. <https://github.com/weatherman-org/telemetry>
2. Dashboard
 - a. <https://github.com/weatherman-org/dashboard>
3. Model
 - a. <https://github.com/weatherman-org/model>
4. Deployment (Houses complete deployment from scratch with optional building)
 - a. <https://github.com/weatherman-org/deployment>

Building the Project

1. git clone <https://github.com/weatherman-org/deployment>
2. make build_deploy

Model Training and Details

Dataset API: <https://archive-api.open-meteo.com/v1/archive>

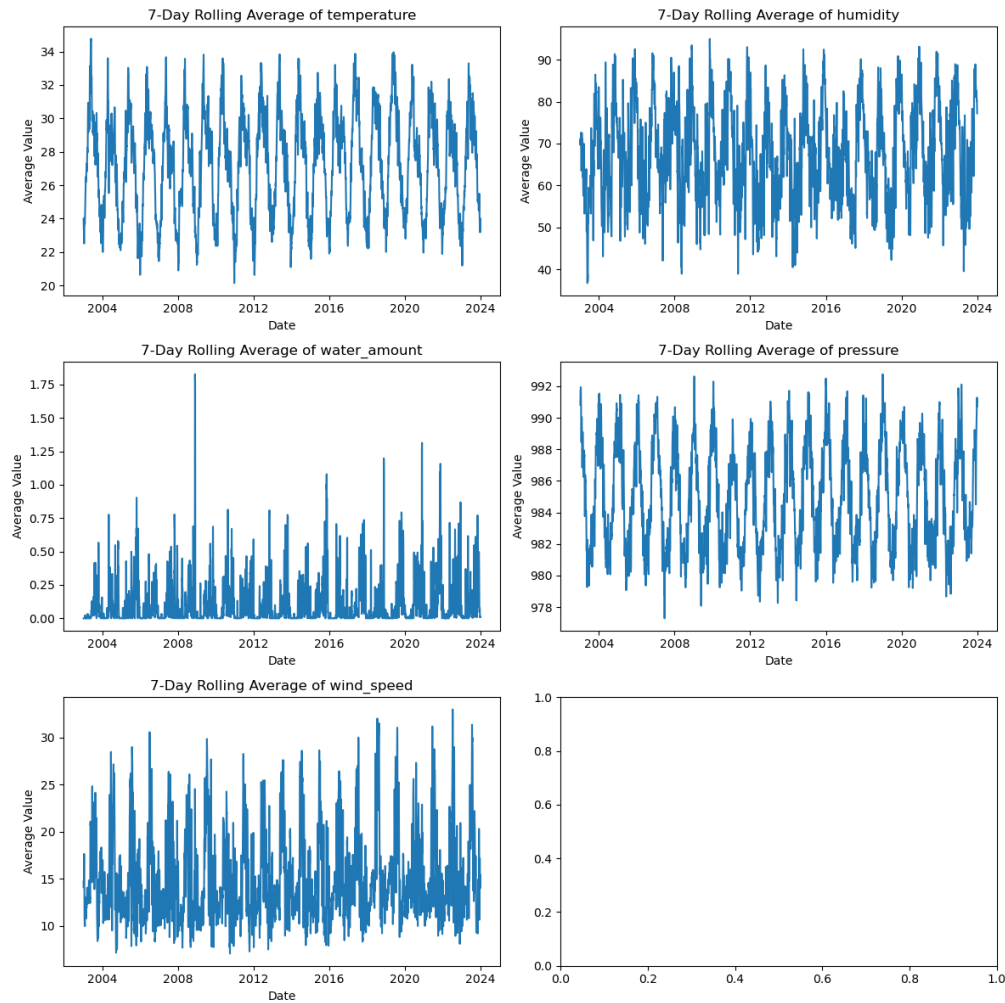
API Params:

```
{  
    "latitude": 12.9184,  
    "longitude": 79.1325,  
    "start_date": "2003-01-01",  
    "end_date": "2024-01-01",  
    "hourly":  
    "temperature_2m,relative_humidity_2m,rain,surface_pressure,wind_speed_100m,wind_dir  
    ection_100m",  
    "timezone": "auto",  
    "format": "csv"  
}
```

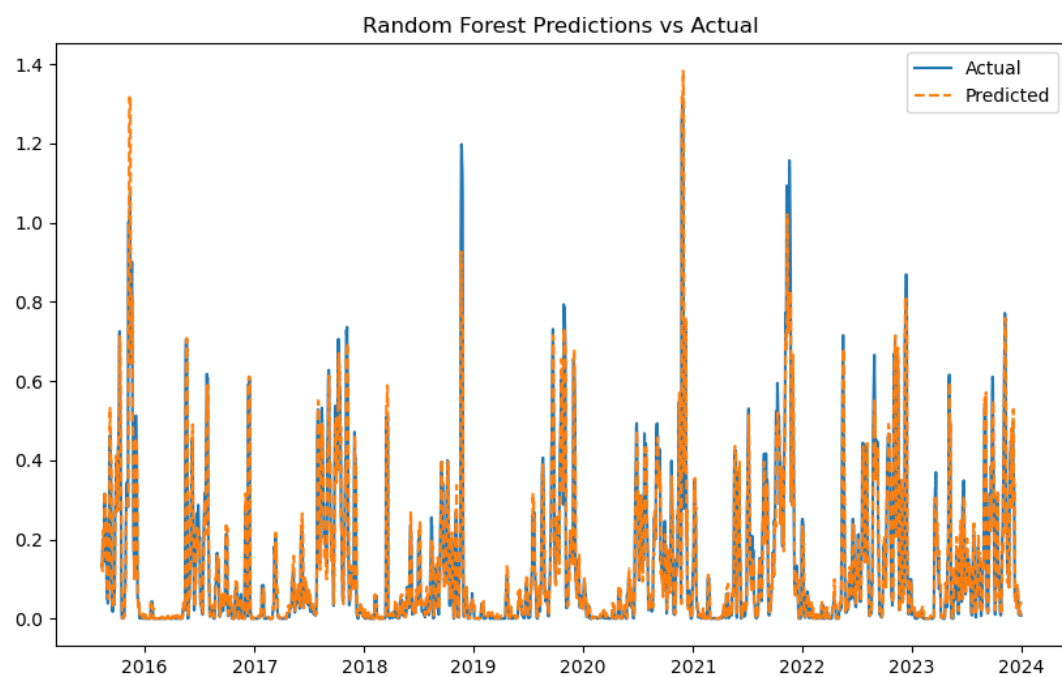
Dataset Example Rows:

	temperature	humidity	water_amount	pressure	wind_speed
time					
2003-01-06	23.980357	69.821429	0.0	990.826786	14.098214
2003-01-07	23.845833	70.880952	0.0	991.144643	14.376190
2003-01-08	23.695238	71.130952	0.0	991.263690	14.573214
2003-01-09	23.708929	70.607143	0.0	991.379167	14.778571
2003-01-10	23.615476	69.827381	0.0	991.552381	14.515476
2003-01-11	23.390476	69.964286	0.0	991.717262	14.530357
2003-01-12	23.195238	70.083333	0.0	991.696429	14.478571
2003-01-13	23.094643	69.702381	0.0	991.708929	15.035119
2003-01-14	22.924405	69.821429	0.0	991.916667	16.200000
2003-01-15	22.843452	69.863095	0.0	991.939286	16.558333

7-Day Rolling Averages of Dataset:

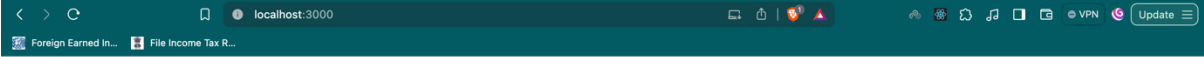


Model Prediction (Orange) vs Actual (Blue):



Dashboard Views

Prediction Page

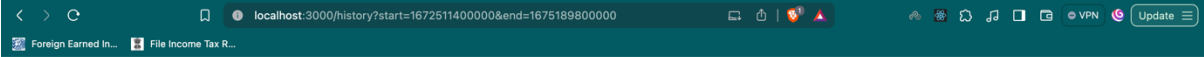


Weatherman

Prediction Data History

Prediction for water is 0.03 millimeters.

Data History Page (Top)

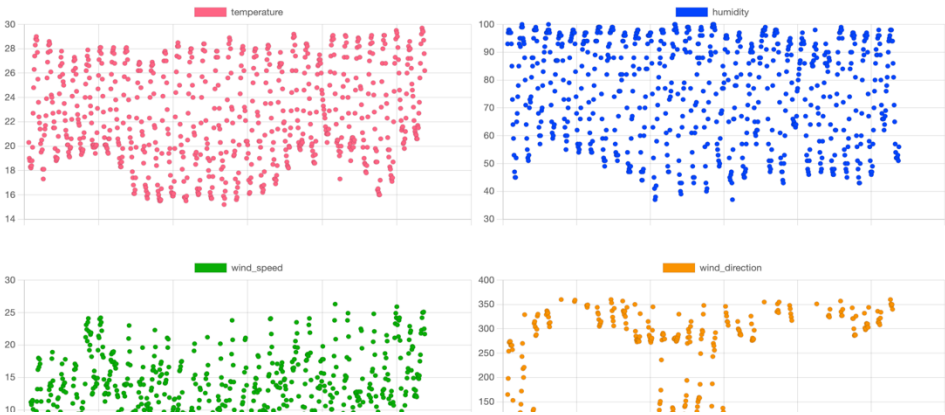


Weatherman

Prediction Data History

Select Date Range

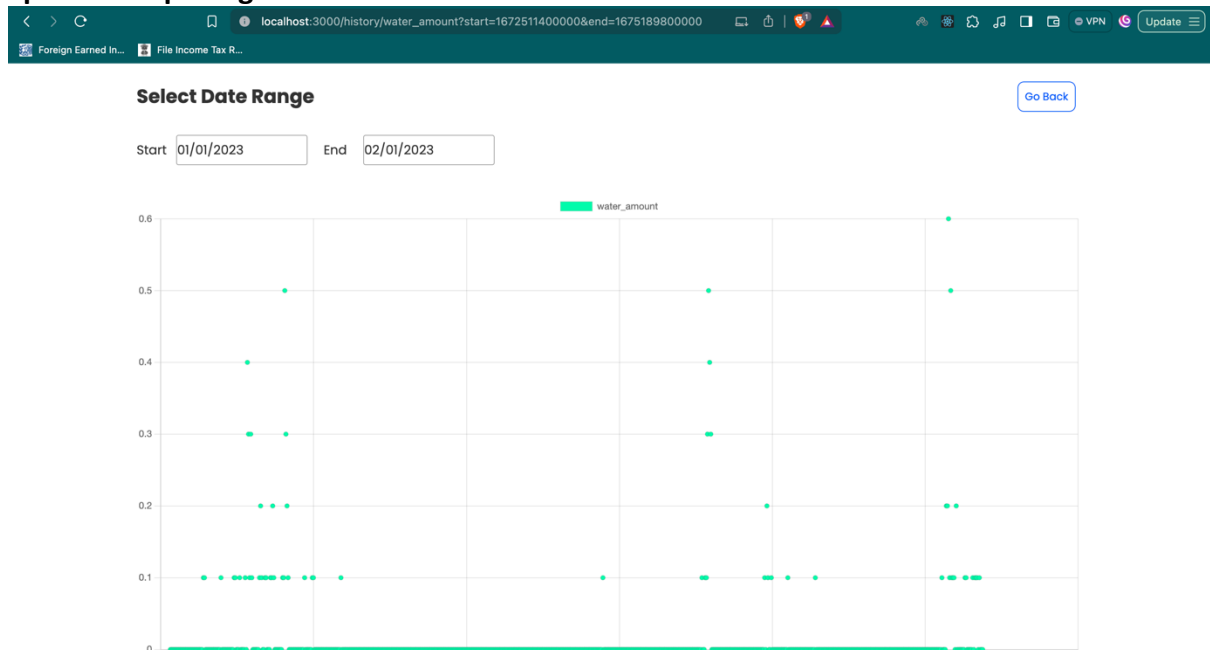
Start End



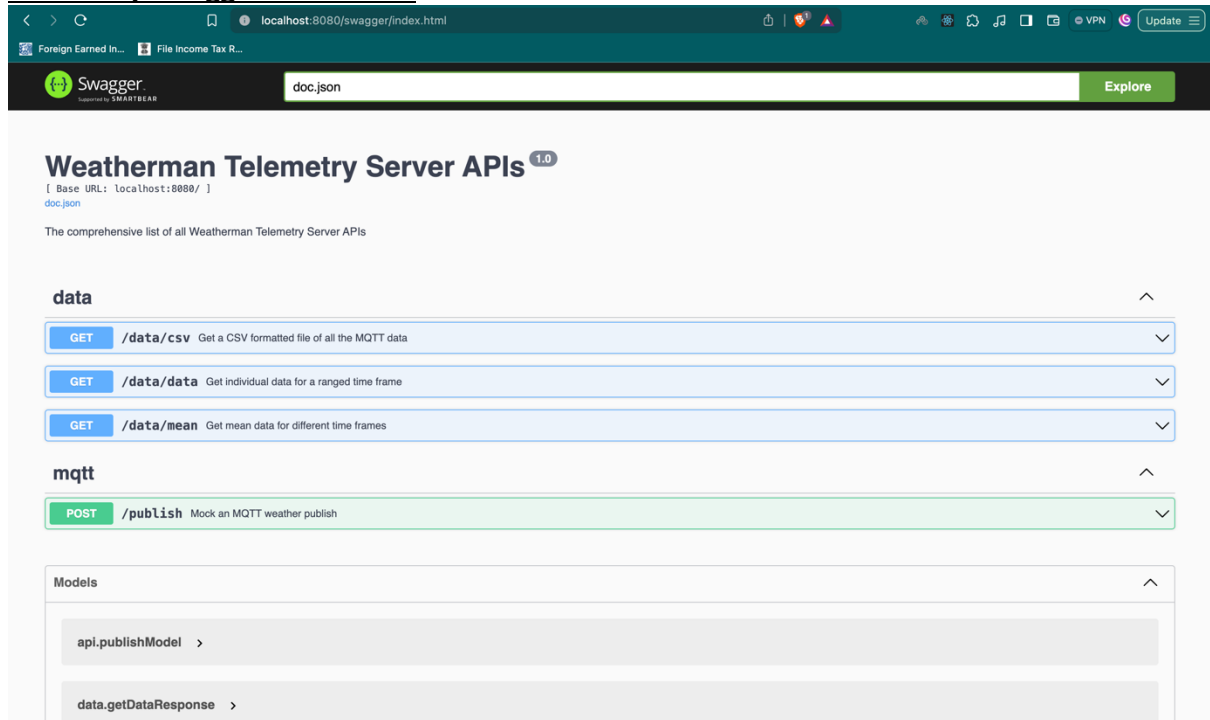
Data History Page (Bottom)



Specific Graph Page



Telemetry Swagger Dashboard



The screenshot shows the Swagger UI for the Weatherman Telemetry Server APIs. The browser address bar indicates the URL is localhost:8080/swagger/index.html. The Swagger logo and a search bar containing 'doc.json' are at the top. The main title is 'Weatherman Telemetry Server APIs' with a version badge '1.0'. Below the title, it says '[Base URL: localhost:8080/]' and 'doc.json'. A description reads: 'The comprehensive list of all Weatherman Telemetry Server APIs'. The API endpoints are categorized into 'data' and 'mqtt'. The 'data' category has three GET endpoints: '/data/csv' (Get a CSV formatted file of all the MQTT data), '/data/data' (Get individual data for a ranged time frame), and '/data/mean' (Get mean data for different time frames). The 'mqtt' category has one POST endpoint: '/publish' (Mock an MQTT weather publish). A 'Models' section is also visible, showing 'api.publishModel' and 'data.getDataResponse'.

Swagger
Supported by SMARTBEAR

doc.json Explore

Weatherman Telemetry Server APIs ^{1.0}

[Base URL: localhost:8080/]
doc.json

The comprehensive list of all Weatherman Telemetry Server APIs

data

- GET /data/csv Get a CSV formatted file of all the MQTT data
- GET /data/data Get individual data for a ranged time frame
- GET /data/mean Get mean data for different time frames

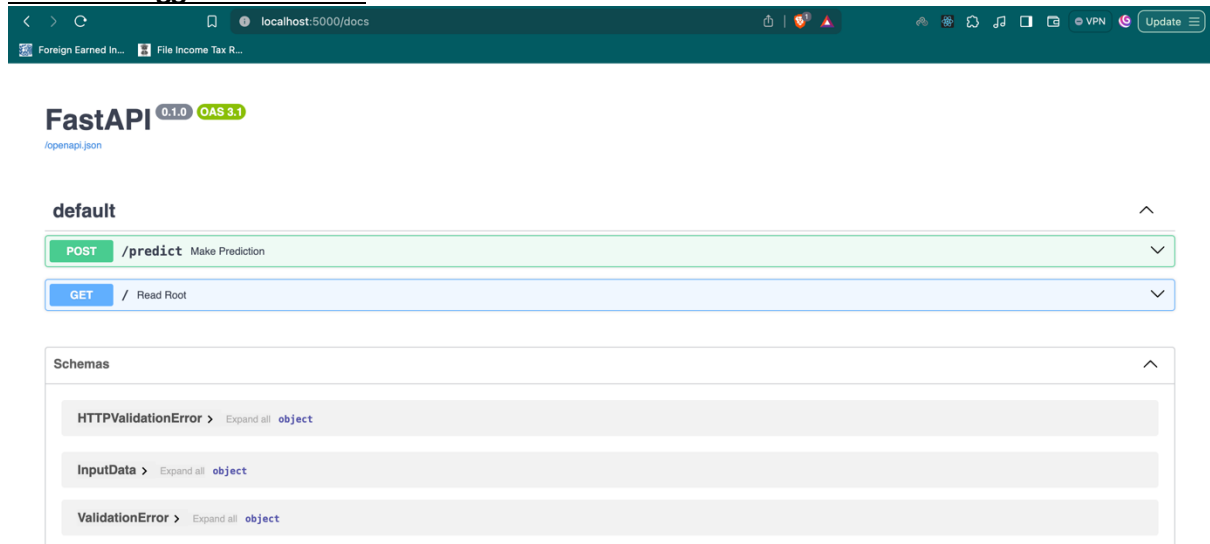
mqtt

- POST /publish Mock an MQTT weather publish

Models

- api.publishModel >
- data.getDataResponse >

Model Swagger Dashboard



The screenshot shows the Swagger UI for the FastAPI Model. The browser address bar indicates the URL is localhost:5000/docs. The Swagger logo and a search bar are at the top. The main title is 'FastAPI' with version badges '0.1.0' and 'OAS 3.1'. Below the title, it says '/openapi.json'. The API endpoints are categorized into 'default'. The 'default' category has two endpoints: a POST endpoint '/predict' (Make Prediction) and a GET endpoint '/' (Read Root). A 'Schemas' section is also visible, showing 'HTTPValidationError', 'InputData', and 'ValidationError'.

Swagger

FastAPI ^{0.1.0} ^{OAS 3.1}

/openapi.json

default

- POST /predict Make Prediction
- GET / Read Root

Schemas

- HTTPValidationError > Expand all object
- InputData > Expand all object
- ValidationError > Expand all object