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chargeTimeAnalytics / README.md

kevinTheQuigley Update README.md

1 contributor

69 lines (46 sloc) | 3.41 KB

CHARGE TIME ANALYTICS

Hello! The goal of this project is to provide analytics to energy consumers to predict optimized charging times for batteries and EV's based on the weather. The following are generated

- A set of AI algorithms which predict the total supply of wind electricity
- A comparison of each algorithm against a set baseline from Eirgrid
- An analytics graph showing a forecast highlighting windows of cheaper-then-average electricity

For more information on the project, please see the Thesis. It is also located on overleaf:- https://www.overleaf.com/read/dwbzdpvkynrg

These files pull data from Met.ie, smartgriddashboard.com and semo.ie

File	Purpose
dataDownloadAndJoin.sh	Executes all download scripts, moves downloaded data to storage and joins historical data
download/fileDownloader*_*.sh	Downloads 1 years worth of data from the smartGridDashboard website. Files downloaded singly to minimize site crash risk
download/metDownload.sh	Downloads Historical data from Met Eireann for eight stations
data/joiner.py	Joins SmartGrid and Met data together into a signle file (weatherMerged.csv)
download/timeGenerator.py	Generates a list of date-times, starting from now and working back 1 month (dateList.txt)
download/priceFinder.sh	Using dateList.txt, pulls all xml files into a single electricity price csv (ePrice.csv)
forecastData/forecastPull.sh	Forecasts for the eight weather stations across Ireland are generated for the coming week
ChargeTimeAnalyticsNotebookFinal.ipynb	This notebook generates an analysis of all csv's and generates a transformed csv, chargeML.csv

File	Purpose
ChargeTimeMLFinal.ipynb	This notebook analysis various ML algorithms and saves some in the models/ folder
predictionTraining.ipynb	This notebook uses the forecast weather data for the coming week to generate a forecast image (forecast.png) of the coming predicted charge time windows
dashboard/chargeTimeDashboard/streamlit_app.py	This python file is used to generate a rudimentary analytics dashboard using the forecasted charge windows

Execution Order

All notebooks are executed using jupyter notebook

Data download- (In a linux Terminal)

- bash downloadAndJoin.sh

Data Analytics:-

- Execute ChargeTimeAnalyticsNotebookFinal.ipynb

ML model generation (Note this must be executed on a suitable linux server, as some packages are unix-specfic

- Execute ChargeTimeMLFinal.ipynb

Prediction Generation

- Execute predictionTraining.ipynb

Dashboard creation

- streamlit run streamlit_app.py --server.port 8070

Creating a schedule to pull wholesale price data

- launch with
- crontab -e
- First program runs every week Sunday at 12:00
- 0 0 * * 0 /bin/bash /home/ubuntu/chargeTimeAnalytics/chargeTimeAnalytics/download/priceFinder.sh

launch with
crontab -e

First program runs every week Sunday at 12:00
0 0 * * 0 /bin/bash /home/ubuntu/chargeTimeAnalytics/chargeTimeAnalytics/download/priceFinder.sh

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