Presentation

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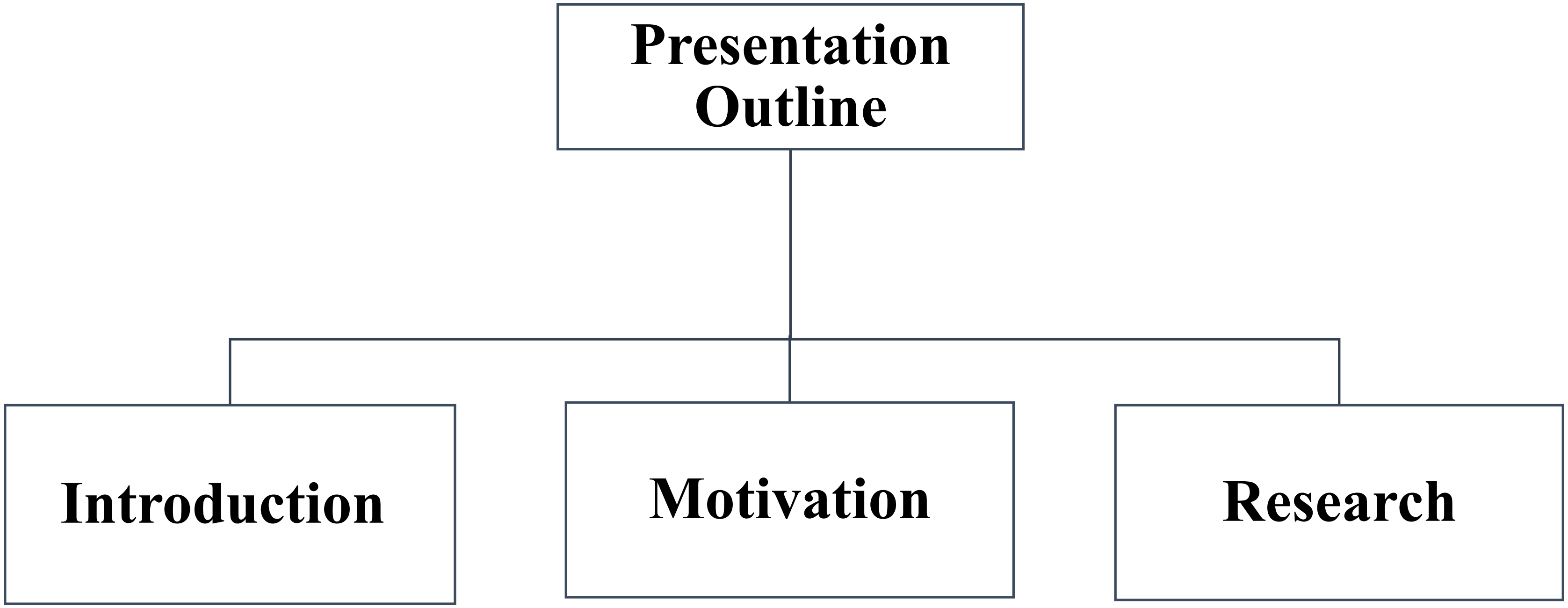
كلية التقنية الصناعية_مصراتة
The College Of Industrial Technology_Misurata

UNC CHARLOTTE
Energy Production and Infrastructure Center (EPIC)

HALMSTAD UNIVERSITY

Northumbria University NEWCASTLE


Presentation Outline
Introduction
Motivation
Research

Introduction

Mohamed Abuella
https://mohamedabuella.github.io https://www.linkedin.com/in/mohamed-abuella/

About Me..
An electrical engineer by training, traditionally is interested in Mathematical and Computational Analysis, Modeling and Optimization, and who is recently passionate in Artificial Intelligence and Data-driven Analytics.

A researcher works to modernize the electric grid and optimize its integration of distributed energy resources by applying descriptive, predictive and prescriptive analytics.

His broader interest involves utilizing Artificial Intelligence to foster Sustainability.

An adaptative to work in a diverse environment for an interdisciplinary research.

Introduction

https://mohamedabuella.github.io/cv

To sum it up in a broad sense, let's imagine that.. If my professional development was a book, its title would be **"Energy Systems Modeling and Analysis: Operation, Planning, and Integration.“**

Thus, the chapters of this book would be as follows:

Ch.1 Fundamentals of Electrical Engineering. This chapter covers Instrumentation & Control, Basics of Power Electronics such as Diodes & Thyristors as rectifiers, (maneuvered by applying Laws of Physics). With getting hands-on electrical installation & wiring and maintenance of electrical control equipment at pumping stations.

Ch.2 Power Systems Analysis. It includes Power Flow and Faults Calculations, (applying Numerical Analysis methods, such as Newton methods, Differential eqs & Integrals, etc). Get hands-on some simulations of power systems and programmable logic controllers (PLC).

Ch.3 Optimal Power Flow (OPF) and Security-Constrained Economic Dispatch (SCED). It is considering renewables as well, specifically for wind energy resources at the transmission level, (applying Optimization techniques). Get hands-on more of modeling and analysis of power systems.

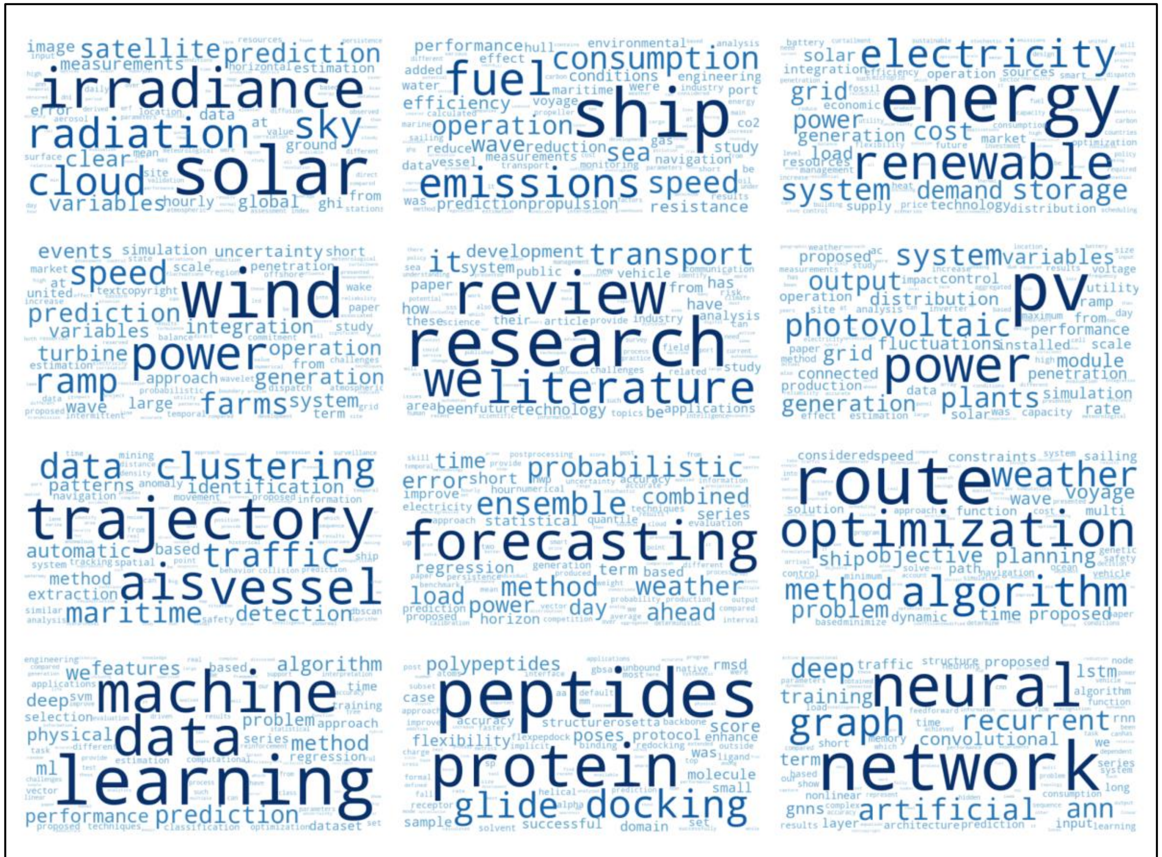
Ch.4 Optimize the Integration of Renewables into the Grid. Solar Power Modeling and Forecasting, (applying Descriptive, Predictive and Prescriptive Analytics, AI and ML techniques). Get hands-on data-driven analytics and become more familiar with conducting & publishing research.

Ch.5 Postdoctoral Researcher at the Center for Applied Intelligent Systems Research (CAISR) at Halmstad University, (Integrated Academy-Industry Collaboration, Applying AI techniques). Dig into research on AI for Sustainability.

Ch.6 Research Fellow at Northumbria University in HI ACT: Hydrogen Integration for Energy

Introduction

In a nutshell, what I am often doing is finding the optimal & root values and curve fitting of nonlinear equations.
..But usually it is not as simple as that!
For more details, you may have a look at pdf copies of my CV and Cloud of Key Skills & Interests.



Introduction

What can I bring to the team..?

- Transfer knowledge and skills to integrate the collaboration between academy and industry:
  - ✓ Energy Systems Modeling & Analysis, Optimization, AI, Geospatial Analysis.
  - ✓ Including Transportation and Maritime Systems.
  - ✓ Including Water and Wastewater experience

- An adaptatively to diverse environment and flexibility to multidisciplinary research:
  - ✓ Study and work in Middle East (Libya): Engineering, Electricity, Water and Wastewater.
  - ✓ Study and work in North America (USA): Energy, Optimization, Statistics, AI.
  - ✓ Work in Europe (Sweden): Energy, Transportation, Maritime, AI.

Motivation

- Professional Advancement
  - ✓ Get an opportunity to collaborate and work with the experts of the field.
  - ✓ To transfer, improve, and acquire knowledge and skills.

- Personal Advancement
  - ✓ Better alignment with personal values and interests.
  - ✓ Better self-esteem.
  - ✓ Better financial security.

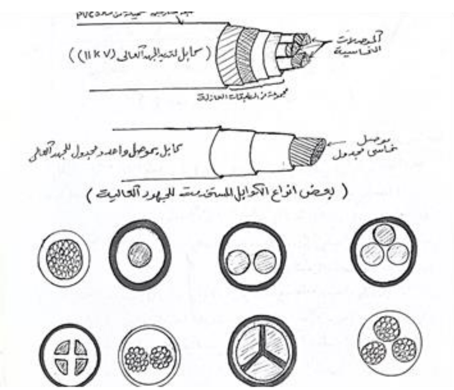
Research

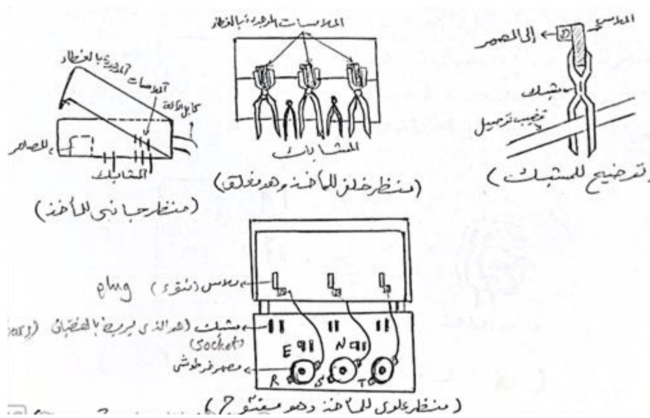
Technical Report of Operation & Maintenance, Internship at Shoes Factory in Misurata, Libya

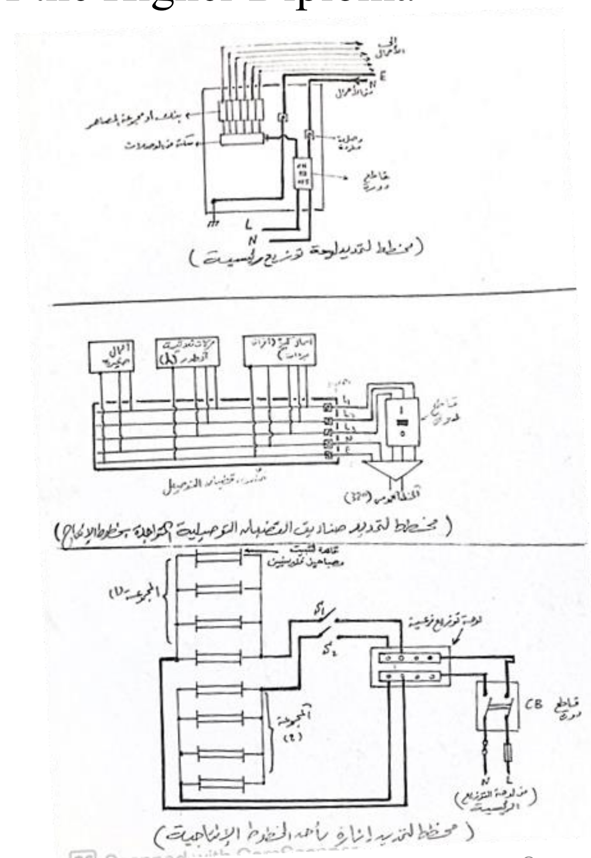
https://www.researchgate.net/publication/344772515_Technical_report_of_maintenance_and_operation_internship_at_shoes_factory_in_Misurata_Libya

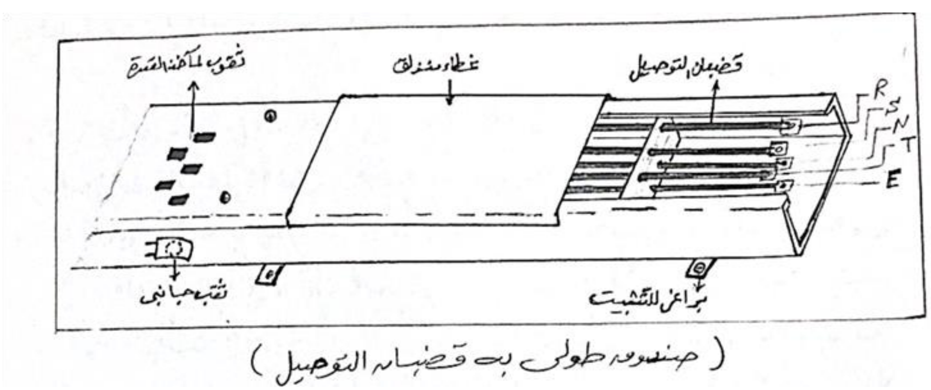
Mohamed Abuella, 2000 at Higher Center of Poly-Profession, Misurata, Libya

Electrical Operation & Maintenance for fulfilling requirement of the Higher Diploma









Research

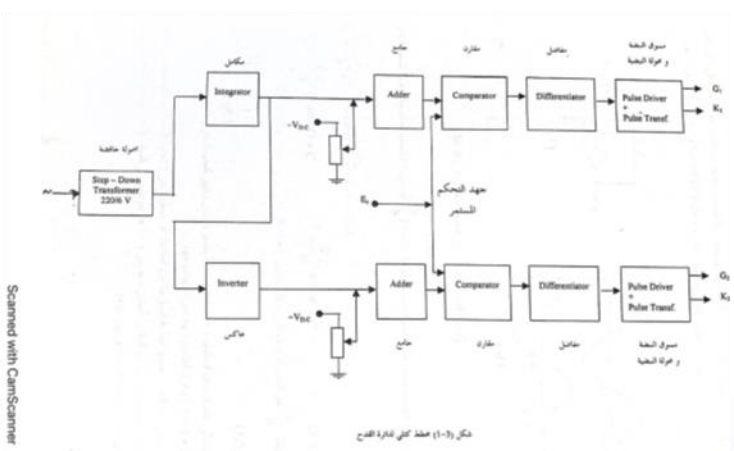
Triggering Circuit for SCR Thyristors of an AC-DC Converter

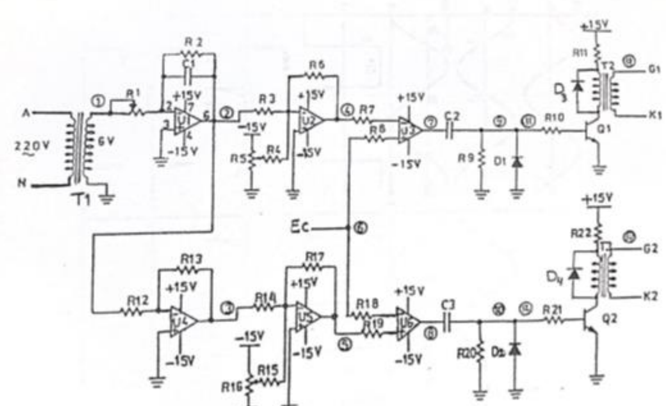
https://www.researchgate.net/publication/277109663_Triggering_Circuit_for_SCR_Thyristors_of_an_AC-DC_Converter

Mohamed Abuella, Ali Mohamed, Al Sayed Hamady,   Advisor: Safa Samarmad
Tech Diploma Project, 2001 at Higher Center of Poly-Profession, Misurata, Libya

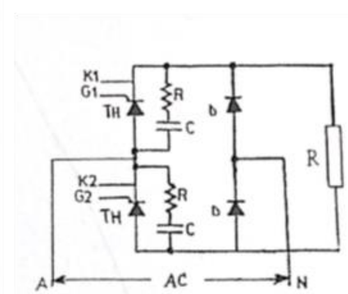
Higher Diploma project was in Power Electronics area. Since the task of the project of three-members-group was to build a triggering electronic circuit for a rectification bridge of Thyristors

Acquired Expertise: Electrical Wiring & Installations, Maintenance & Operation





الشكل (3-9) الشكل التفصيلي لدائرة القدح



Number:
Status: Production
Package Type: TO-48 (1/4)
Circuit Type: DISCRETE
Support Docs: datasheet
Product Line: SCR Phase Control (discrete)
FOD #: 30060

TO 48

Parameter	Limit	Units	Condition	Value
VDRM	MIN	Volts	NA	1200
IT(RMS)	MAX	Amps	NA	35
IT(av) comp.(a)	MAX	Amps	NA	22
@ TC	---	o C	NA	85
ITSM (50Hz)	MAX	Amps	NA	335
ITSM (60Hz)	MAX	Amps	NA	355
Vgt	Max	Volts	NA	2
Igt	Max	mAmps	NA	60
VTM comp.(a)	MAX	Volts	NA	1.7
@ ITM comp. (a)	---	Amps	NA	70
DV/DT	MAX	V/us	NA	300
Rth(JC)	MAX	o C/W	NA	.86

Research

Study of NEPLAN Software for Power Flow and Short Faults Analysis

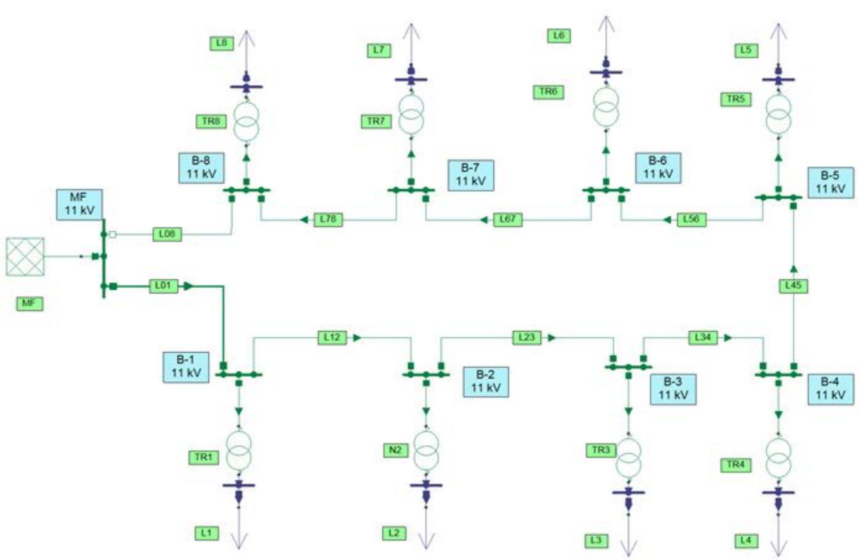
https://www.researchgate.net/publication/277110587_Study_of_NEPLAN_Software_for_Load_Flow_and_Short_Faults_Analysis/stats

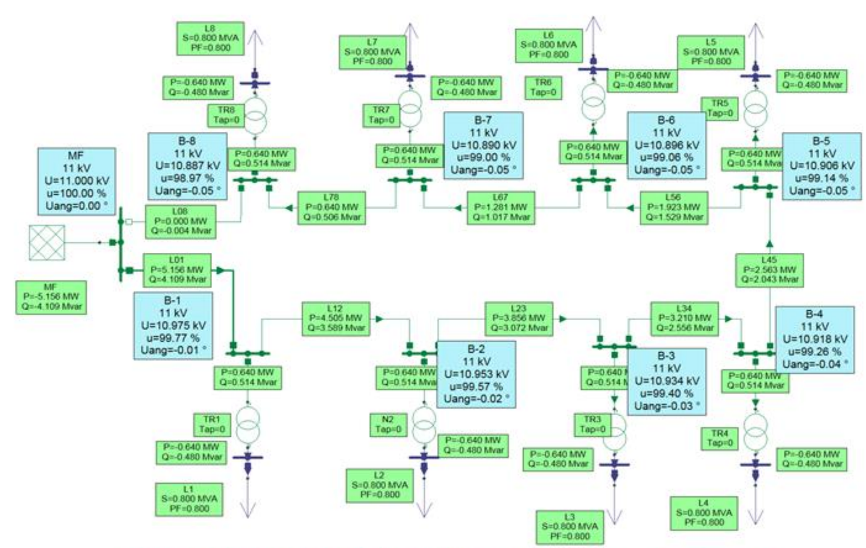
B.Tech Project, 2008 at College of Industrial Technology, Misurata, Libya
Advisor: Mohamed Shetwan

Acquired Expertise: Teaching, Tutorials, Lab Modeling & Simulations, Curriculum Revision & Prepartion, Dedication, Listening, "Try to Modeling the Student’s Way of Thinking.”
Software Tools including: MS Office, MATLAB, NEPLAN, PLC’s Ladder Logic

• حساب سريان القدرة لشبكة التوزيع:

شبكة التوزيع الكهربائية (11/0.4 KV) للوحدات السكنية





النتائج ظاهرة على مخطط شبكة التوزيع الكهربائية (11/0.4 KV) للوحدات السكنية

Research

SMART GRID, Seminar

https://www.slideshare.net/MohamedAbuella/smart-grid-37661484
Smart Grid Presentation in Seminar Course, 2012 at Southern Illinois University at Carbondale

Study of particle swarm for optimal power flow in IEEE benchmark systems including wind power generators

https://www.proquest.com/openview/21da3b4335a4c23278e9bd91d67a7784/1?pq-origsite=gscholar&cbl=18750
Master of Science Thesis, 2012 at Southern Illinois University at Carbondale, USA
Advisor: Constantine Hatziadoniu

Acquired Expertise: Power Systems Analysis, Operation and Planning, Systems Optimization, Smart Grid, Research Conducting, Software Tools: MATPOWER, PowerWorld, PSAT, LaTeX

Research

Study of particle swarm for optimal power flow in IEEE benchmark systems including wind power generators

https://www.proquest.com/openview/21da3b4335a4c23278e9bd91d67a7784/1?pq-origsite=gscholar&cbl=18750

Master of Science Thesis, 2012 at Southern Illinois University at Carbondale, USA

Advisor: Constantine Hatziadoniu

SIU CARBONDALE

$$J_{Min} = \sum^{M} C_i(p_i) + \sum^{N} C_{wi}(w_i) + \sum^{N} C_{p,i}(w_i) + \sum^{N} C_{r,i}(w_i)$$

Subject to:

$$p_{i,\min} \le p_i \le p_{i,\max}$$

$$0 \le w_i \le w_{r,i}$$

$$\sum_i^M p_i + \sum_i^N w_i = L$$

$$V_i^{\min} \le V_i \le V_i^{\max}$$

$$S_{line,i} \le S_{line,i}^{\max}$$

Where:

$$C_i = a_i P_i^2 + b_i P_i + c_i$$

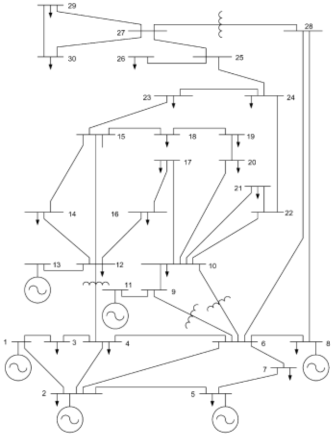
$$C_{w,i} = d_i w_i$$

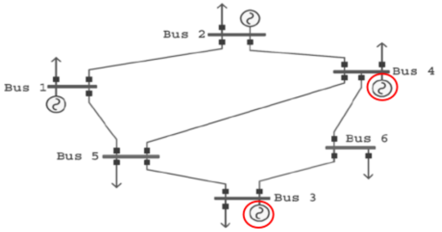
$$C_{p,i} = k_{p,i} \int_{w_i}^{w_{r,i}} (w - w_i) f_W(w) dw \text{ (underestimation)}$$

$$C_{r,i} = k_{r,i} \int_{0}^{w_i} (w_i - w) f_W(w) dw \text{(overestimation)}$$

$$C_i = a_i P_i^2 + b_i P_i + c_i$$

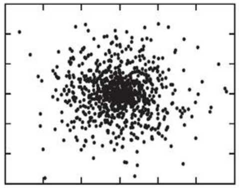
$$C_{w,i} = d_i w_i$$





Gen. No.	a ($/MW^2.hr)	b ($/MW.hr)	c	PG_low (MW)	PG_high (MW)
1	0.012	12	105	50	250
2	0.0096	9.6	96	50	250
3	0	8	0	0	$\boxed{40}$
4	0	6	0	0	$\boxed{40}$

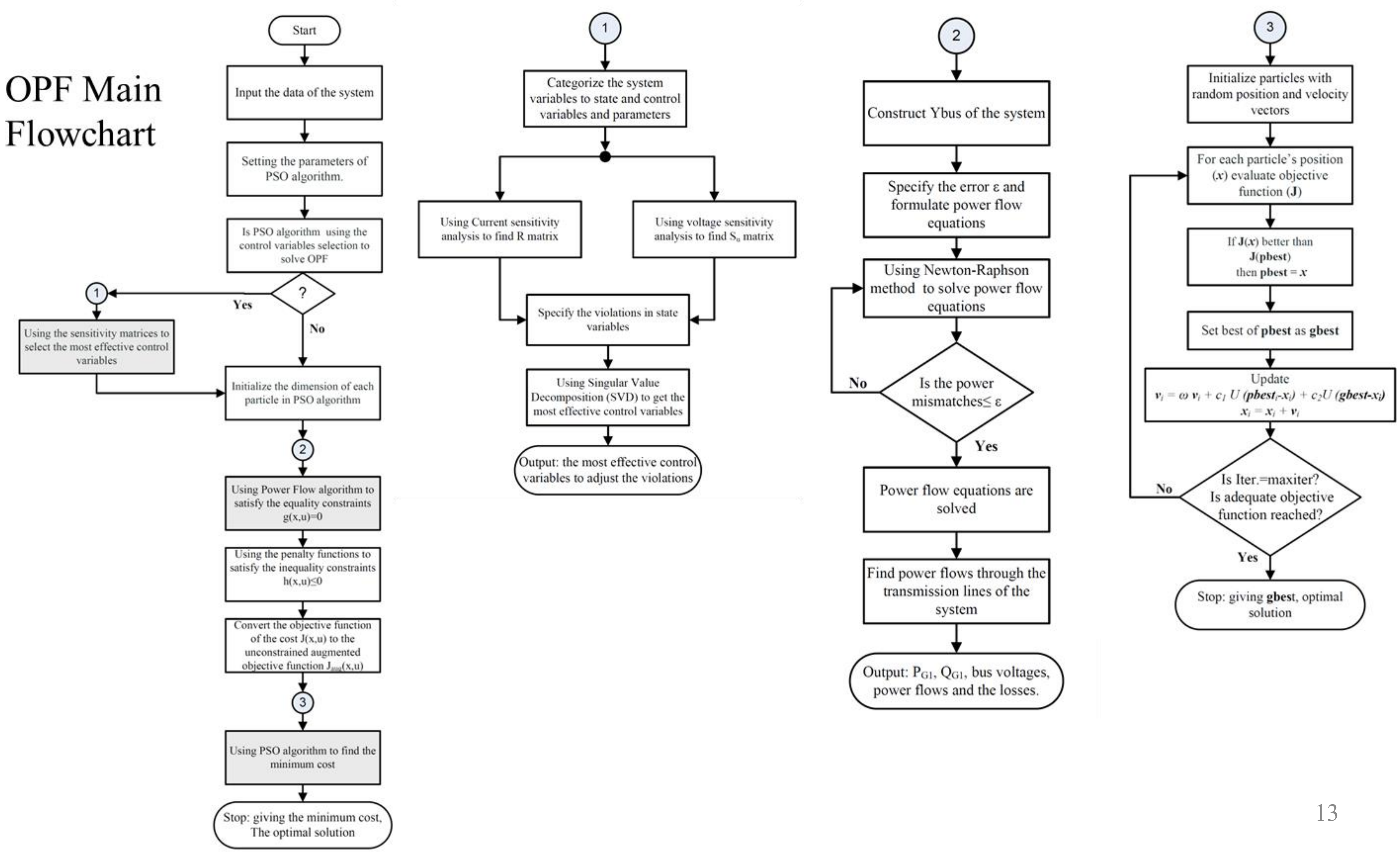
PSO



Particle Swarm Optimization (PSO) algorithm is used for solving this optimization problem.

Research

Study of particle swarm for optimal power flow in IEEE benchmark systems including wind power generators

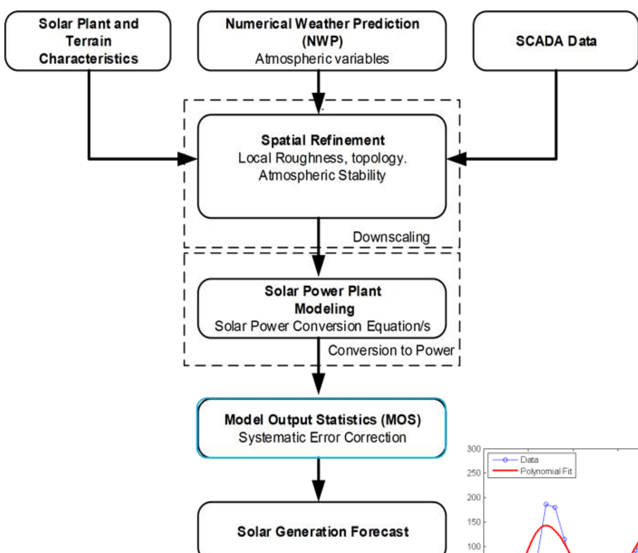


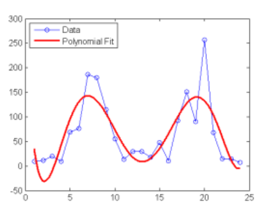
Research

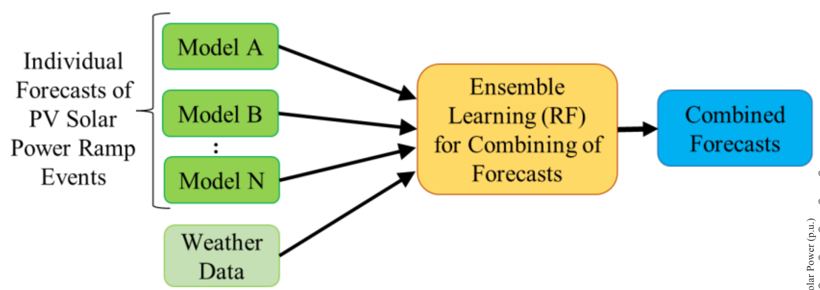
A Post-Processing Approach for Solar Power Combined Forecasts of Ramp Events
https://www.proquest.com/openview/42049145119c7760f93ea736b37a0930/1.pdf?pq-origsite=gscholar&cbl=18750
PhD Thesis, 2018 at University of North Carolina at Charlotte, USA
Advisor: Badrul Chowdhury

UNC CHARLOTTE

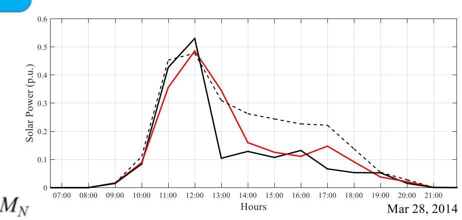
Acquired Expertise: Energy Analytics, Energy Markets, Renewable Energy Integration, Asset & Supply Chain, Time Series Analysis & Modeling, Risk & Uncertainty Quantification, Machine Learning, Big-Data Processing, Research Publishing & Peer Reviewing, Software Tools including SAS, R, and Python







General diagram of combining different models



$$F_{comb}=W_A*M_A+ W_B*M_B + W_C*M_C \dots + W_N*M_N$$

Method of Combining The Models ⇨ **Random forest (RF)** is chosen to be the ***ensemble learning*** method for combining the various models' outcomes.

Research

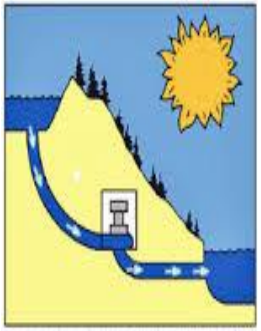
Why Forecast?

$$P_{Supply} = P_{Demand} + P_{Loss}$$

PV Solar Power Generations are Too Variable

Coordination with Operating Reserves and Energy Storage Systems

Reducing Cost and Pollution



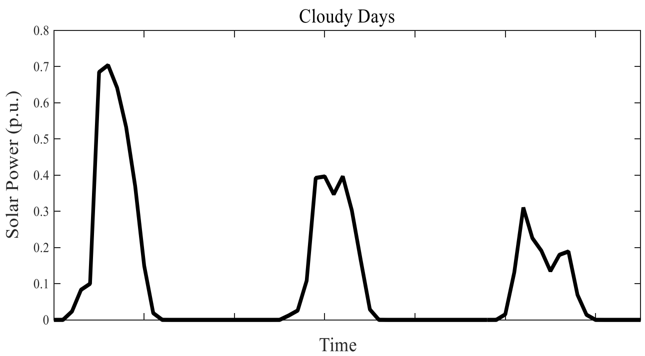


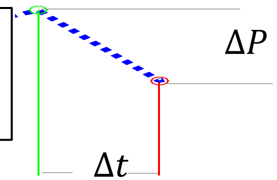
Illustration of the motivation of PV solar power forecasts

Research

Definition of Ramp Events

Solar power ramp rate (RR) is *the change of solar power during a certain time interval.*

$$\boxed{Ramp\ Rate, RR(t) = \frac{dP(t)}{dt} = \frac{P(t+D) - P(t)}{D}}$$



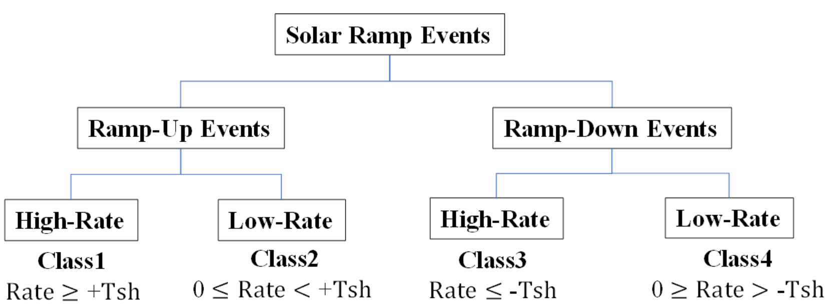
where P(t) is the solar power of the target hour, it can also be its forecast F(t); D is the time duration for which the ramp rate is determined.

For the illustrated cloudy day below:

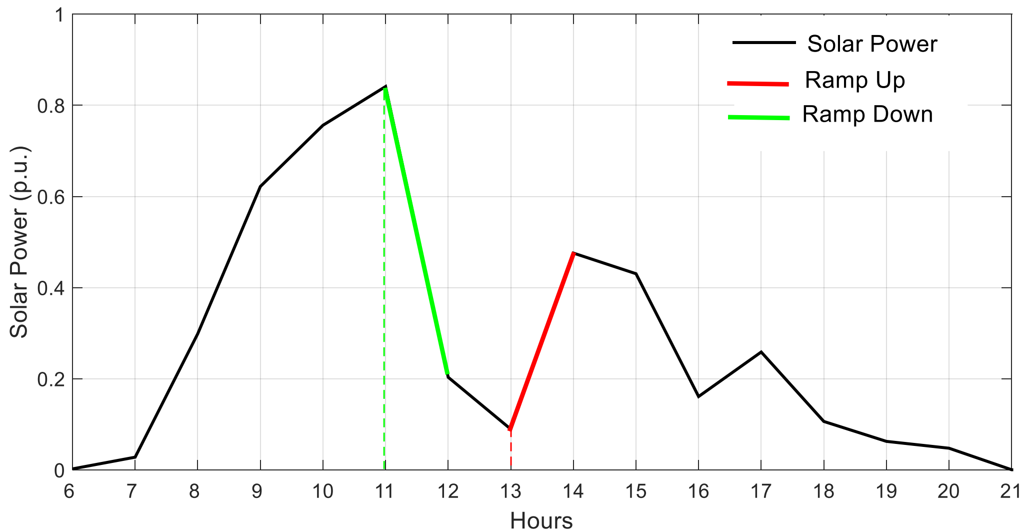
Ramp rate, $\frac{\Delta P}{\Delta t} = \frac{0.2 - 0.85}{12{:}00 - 11{:}00} = -0.65\ (-65\%)\ \mathit{ramp\ down\ of\ its\ normal\ capacity,\ (pu/hr)}$

Ramp rate, $\frac{\Delta P}{\Delta t} = \frac{0.48 - 0.1}{14{:}00 - 13{:}00} = +0.38\ (+38\%)\ \mathit{ramp\ up\ of\ its\ normal\ capacity,\ (pu/hr)}$

Some ramps are with low rates, while others with high rates.



Distribution of the classes of solar power ramp events



Ramp Events During a Cloudy Day

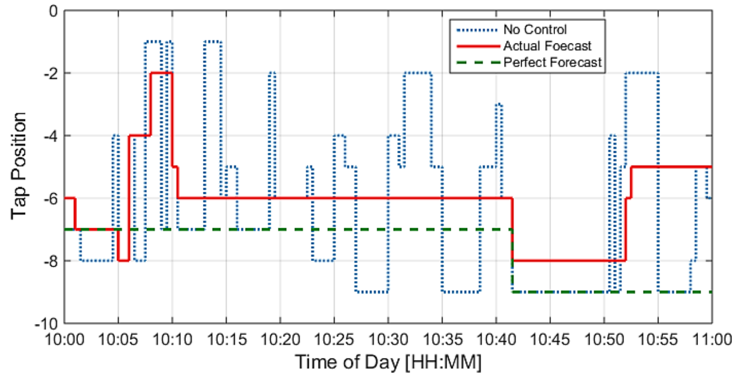
Research

Potential Applications

There are several applications of power systems that rely on solar power ramp event forecasts

Distribution level:

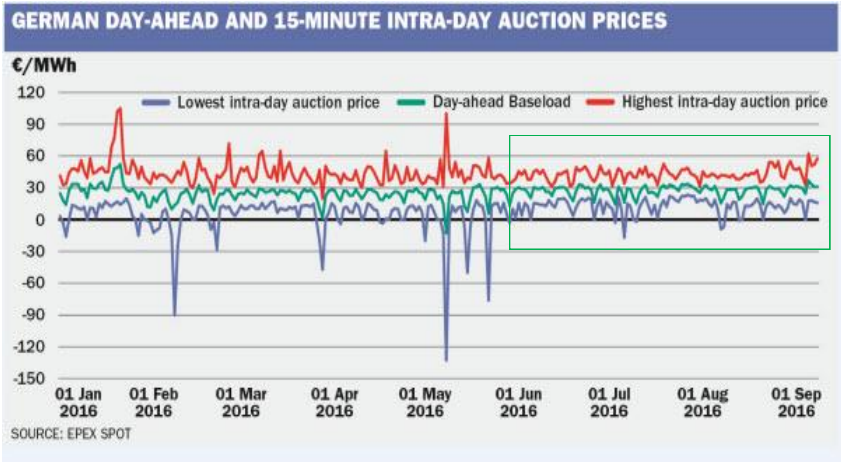
- Optimizing the voltage regulation equipment.
- Control schemes of energy storage systems.



Optimizing the Transformer's Tap Changer position sequences using the solar forecast

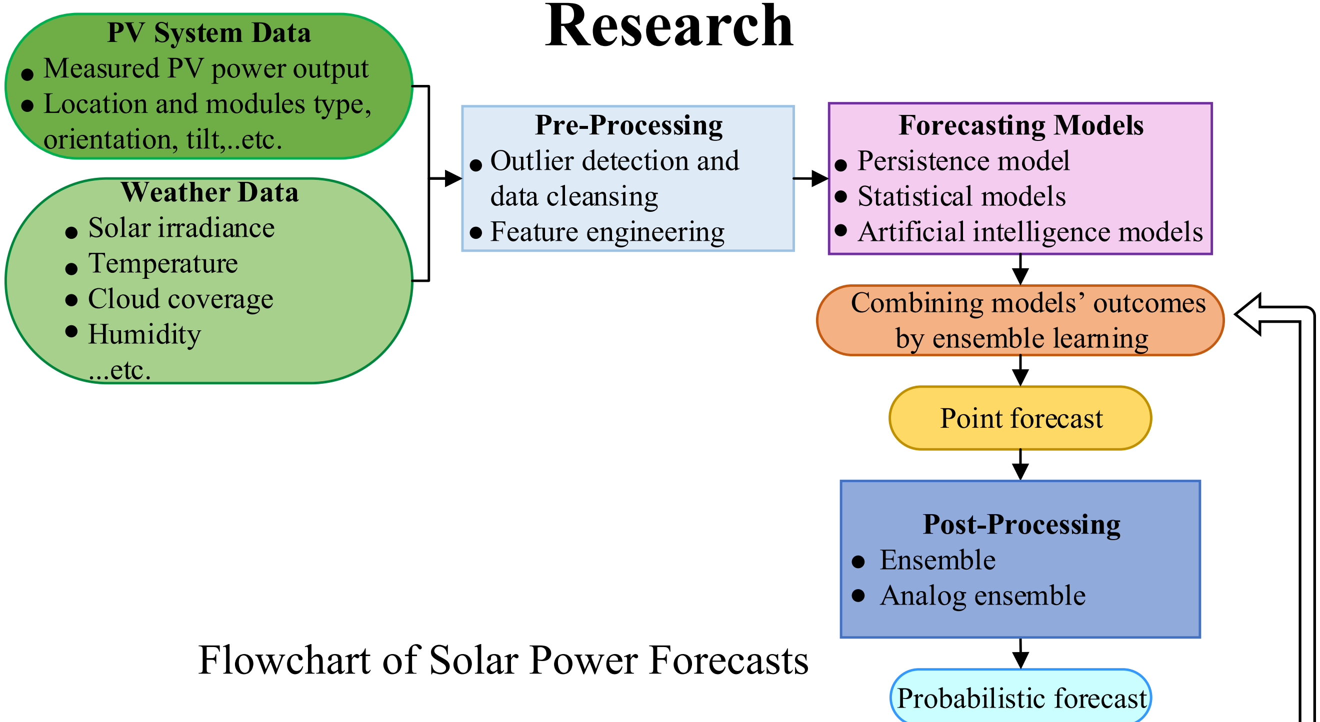
Transmission / bulk level:

- Trading & dispatching the operating reserve.
- Managing the ramp capability / system flexibility with high-level of renewable energy integration.

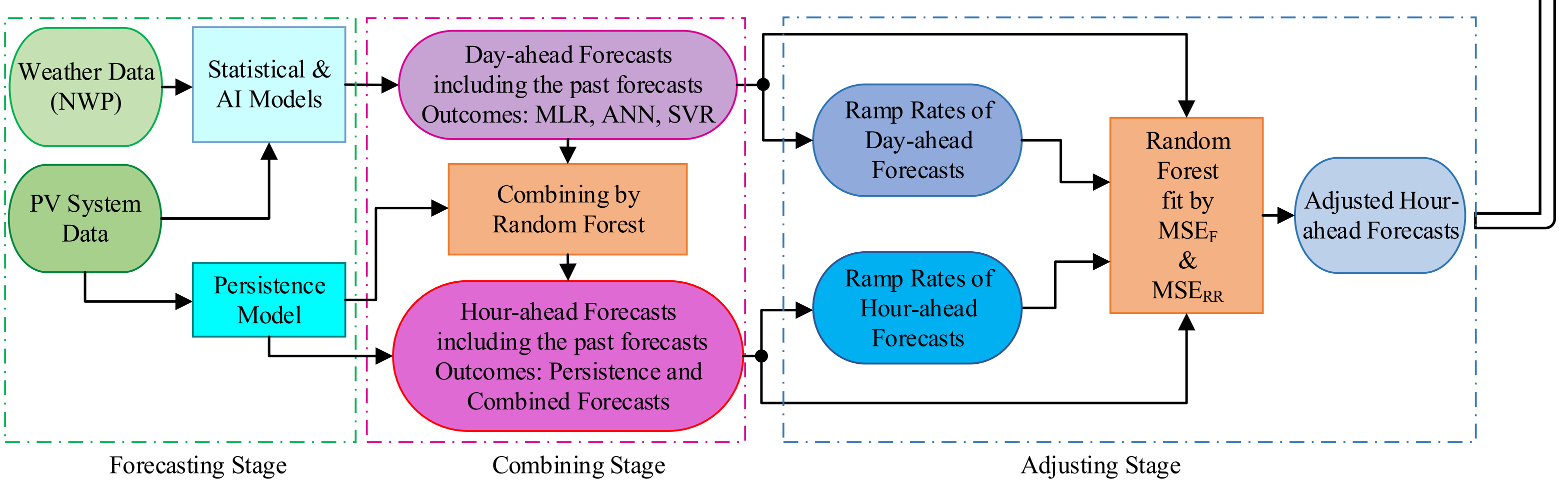


EPEX: European power exchange spot trading

Research

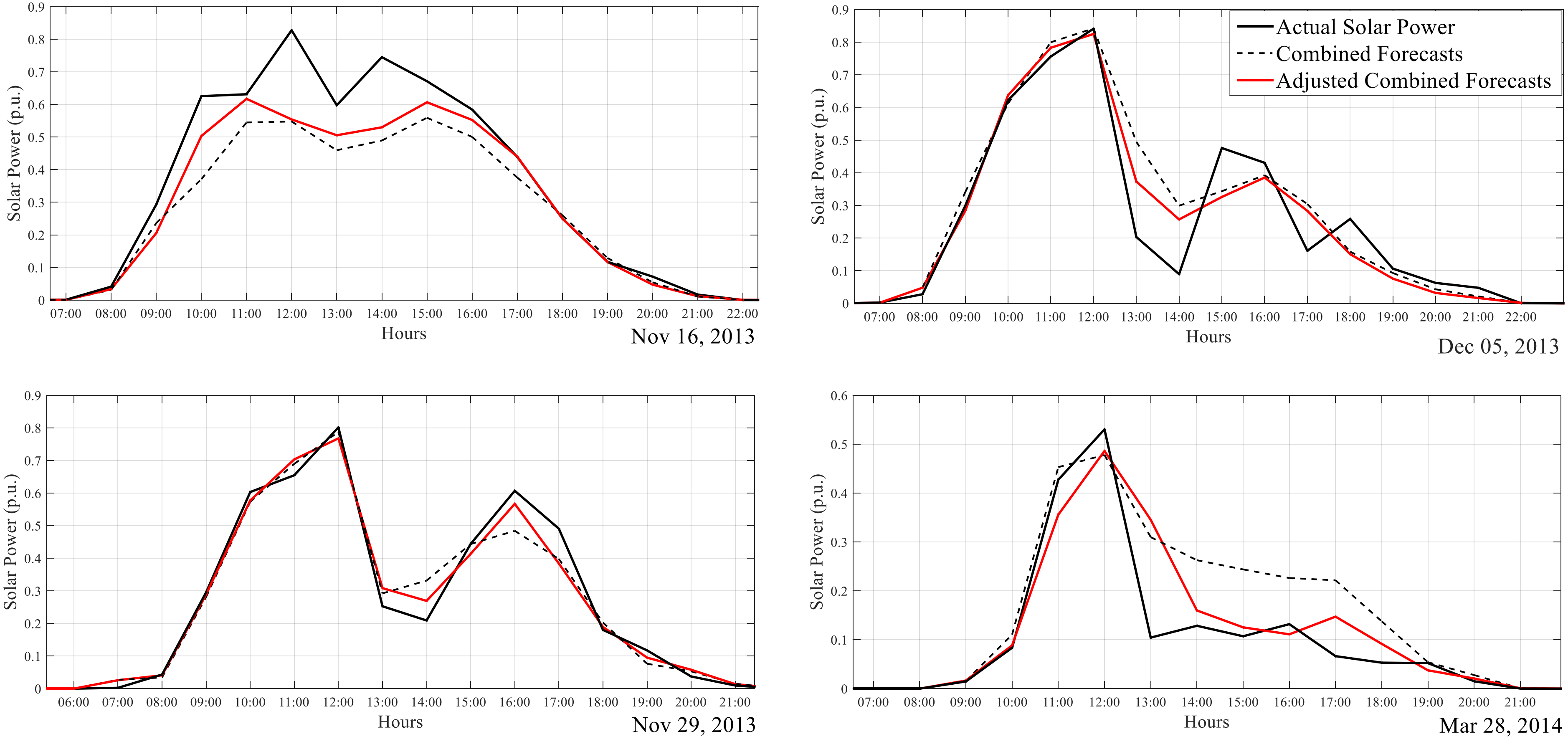


Flowchart of Solar Power Forecasts



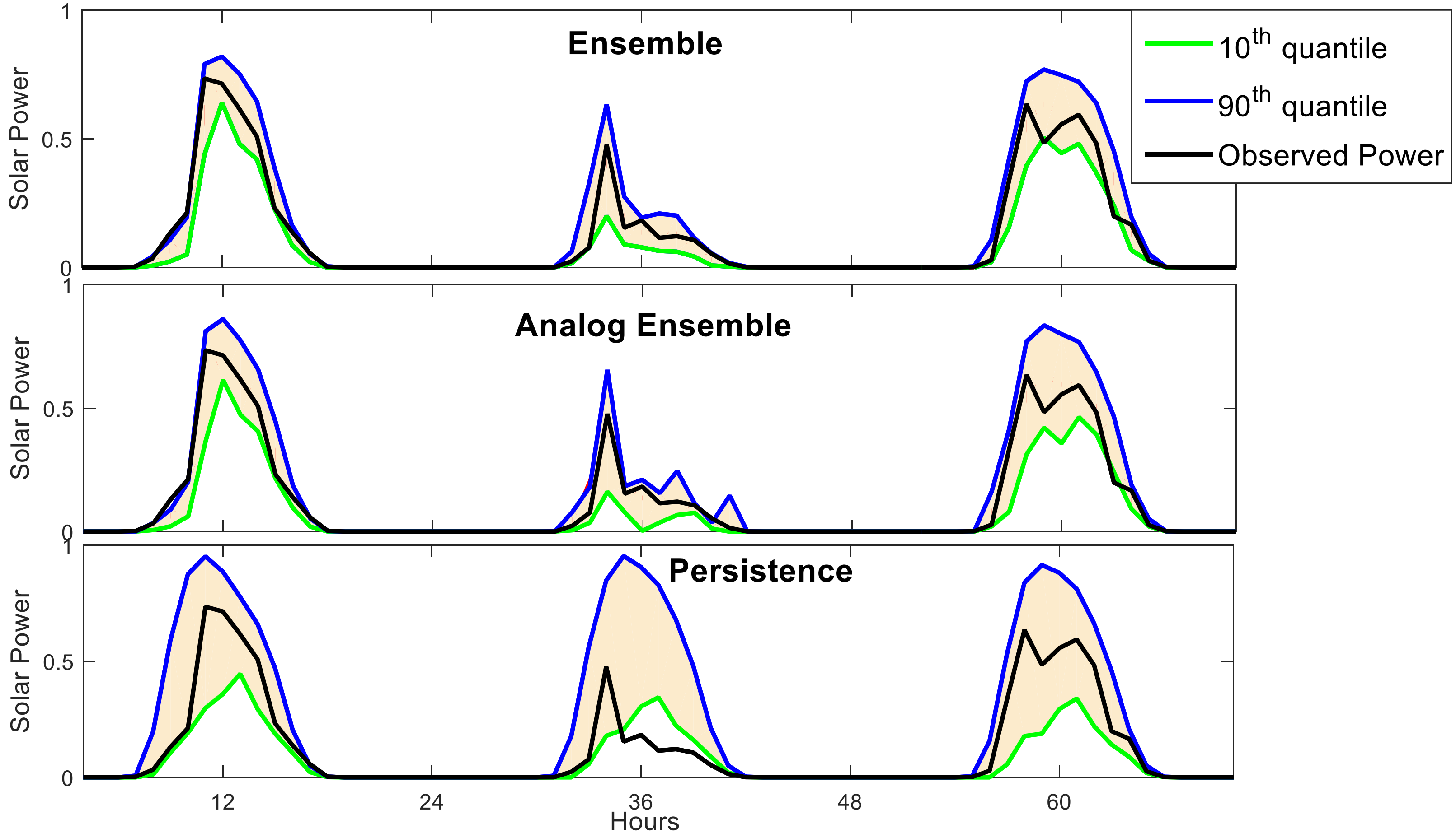
Block diagram of the adjusting approach

Research



Combined forecasts of solar power for cloudy days before and after applying the adjusting

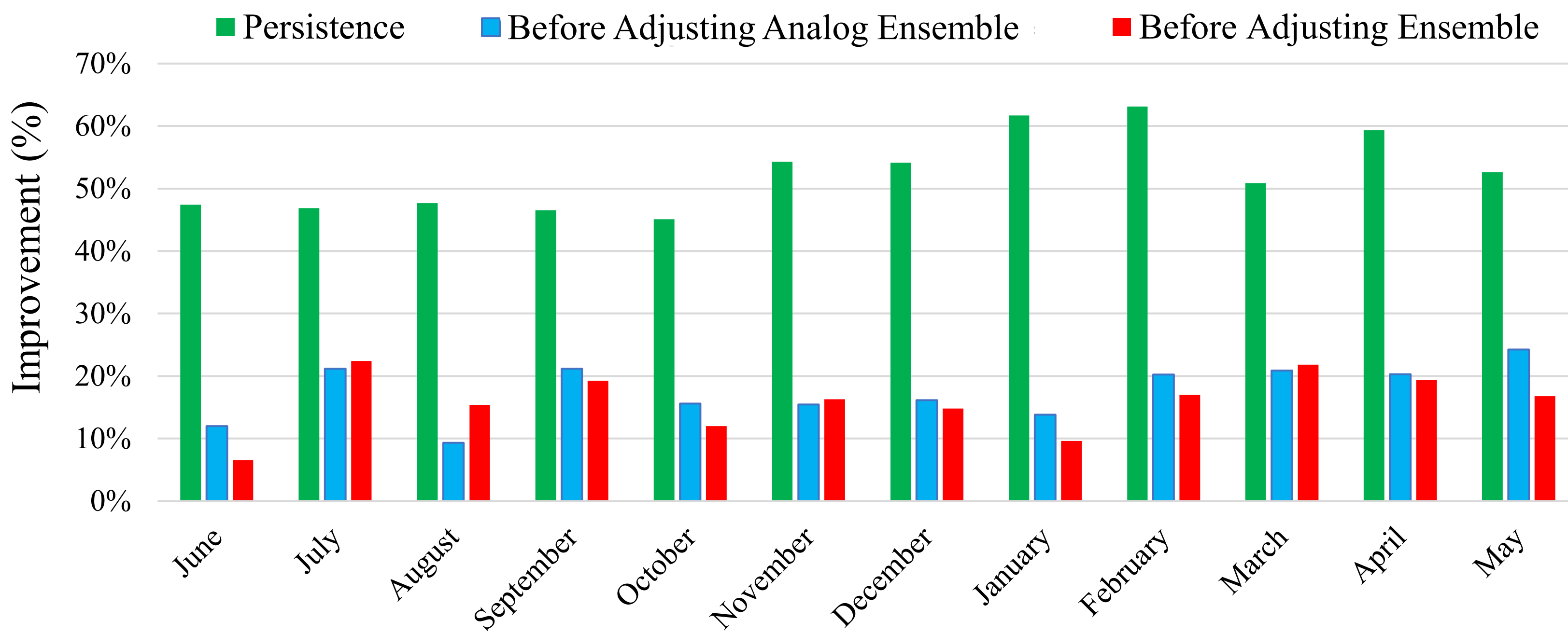
Research



Graphs of the probabilistic forecasts of the three methods for three days

Research

Improvement of Adjusted Ensemble-based Probabilistic Forecasts Over:



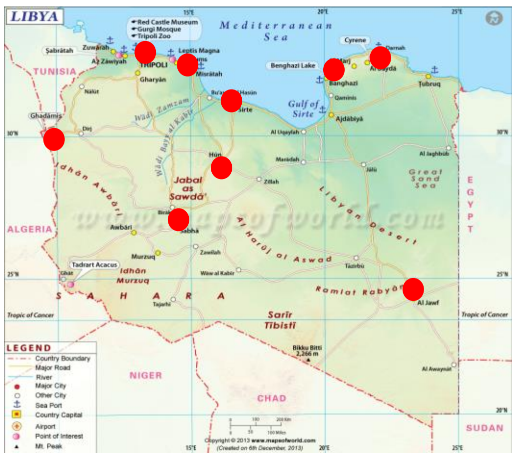
$$Skill\ Score\ (\%) = \left(1 - \frac{Metric_{method}}{Metric_{reference}}\right) * 100$$

Average Improvement of the Adjusting Approach:
51% over Persistence;
16% over Analog Ensemble;
15% over Ensemble.

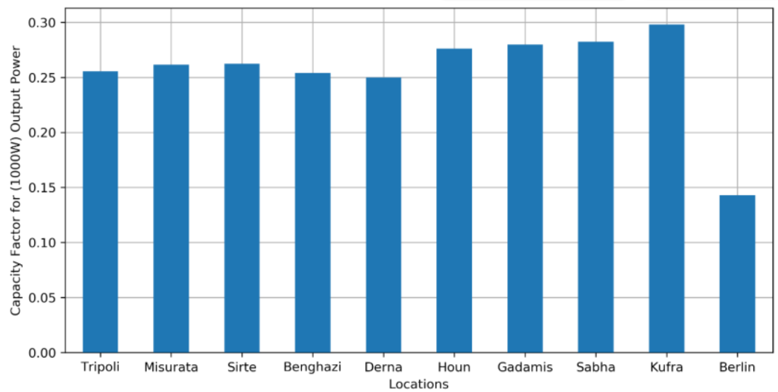
Research

Planning and Analysis for Solar Energy in Libya

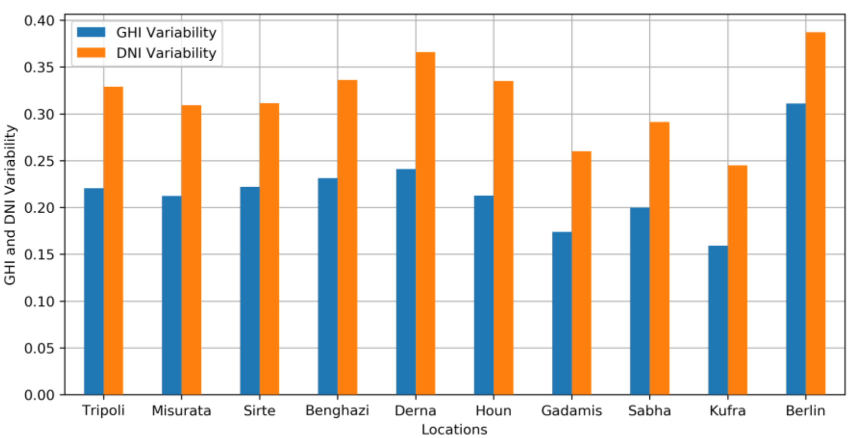
9 Locations for Comparison of Solar Energy Modeling and Analysis: Tripoli, Misurata, Sirte, Benghazi, Derna, Houn, Gadamis, Sebha, Kufra
Typical Meteorological Year (TMY) data represents the weather for a "median year". https://developer.nrel.gov/

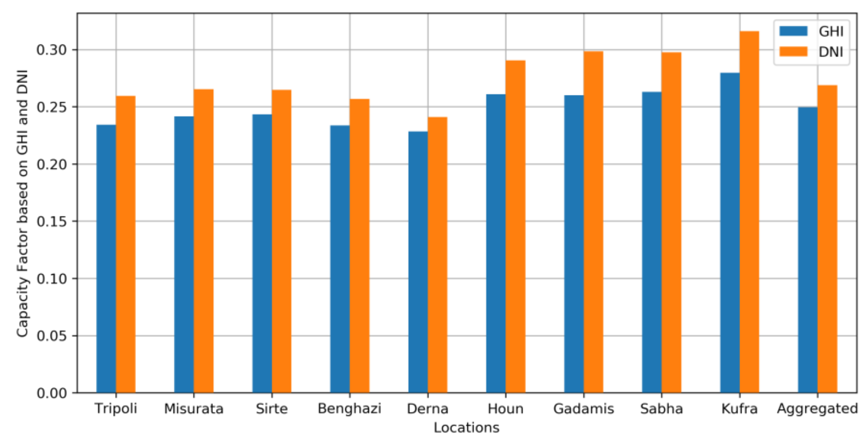


Solar Energy Modeling | **Capacity Factor of Solar Energy Resources** | **Variability of Solar Energy Resources** | **Aggregation of Solar Energy Resources**



The Capacity Factor is calculated based on output power (PWac).
The Rating of Solar PV System =1000W during an entire year = 8760 hours.



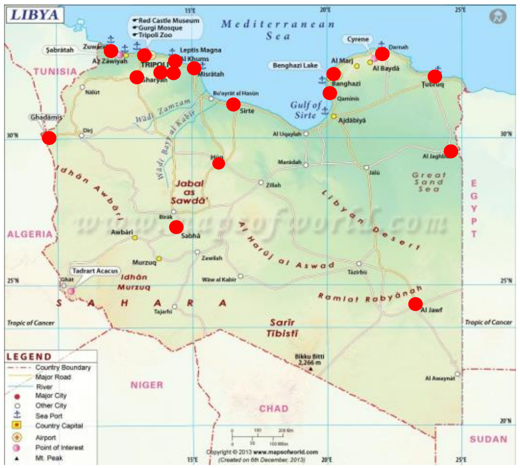


Research

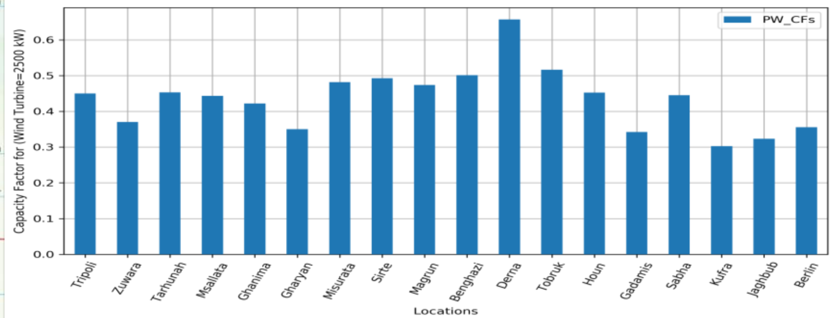
Planning and Analysis for Wind Energy in Libya

17 Locs: Tripoli, Misurata, Tarhunah, Ghanima, Msallata, Zuwara, Gharyan, Sirte, Benghazi,Magrun, Derna, Houn, Gadamis, Sabha, Kufra, Tobruk, Jaghbub

Typical Meteorological Year (TMY) data represents the weather for a "median year”. Data are retrieved from NREL’s Developer Network: https://developer.nrel.gov/ Comparison of Monthly Average Wind Speed (m/s) at Height of 10m

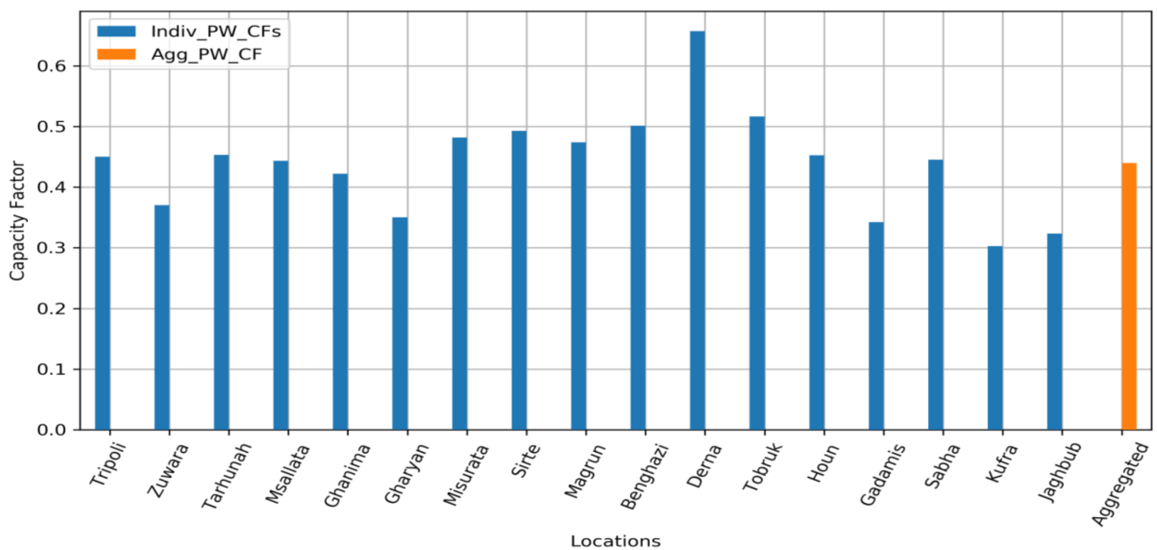


- Wind Energy Modeling
- Capacity Factor of Wind Energy Resources
- Variability of Wind Energy Resources
- Aggregation of Wind Energy Resources



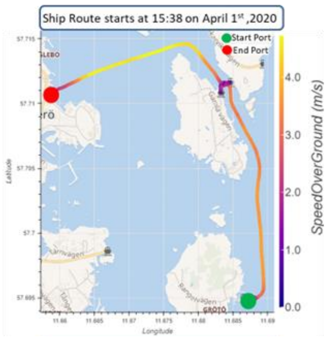
The Capacity Factor is calculated based on Output power (PWac).
The Rating of Solar PV System =1000W during an entire year = 8760 hours.

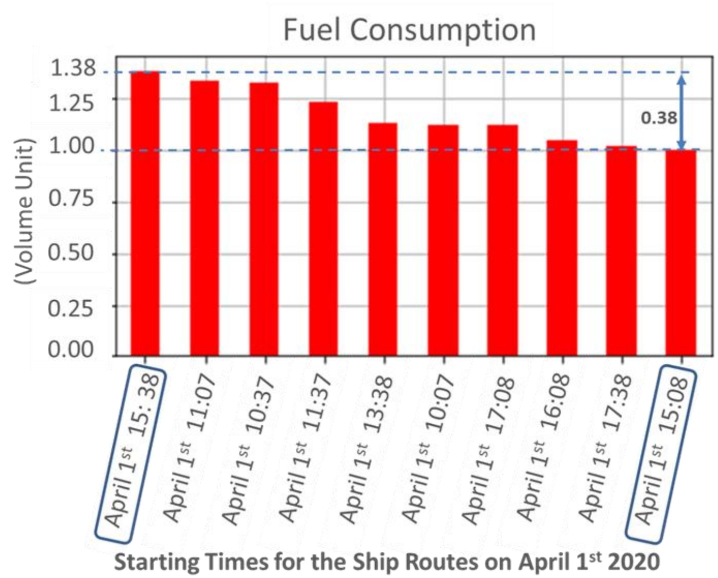
Berlin in Germany has been added just for sake of comparison.

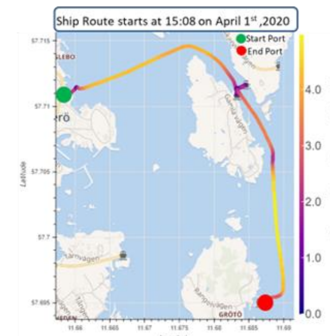


Research

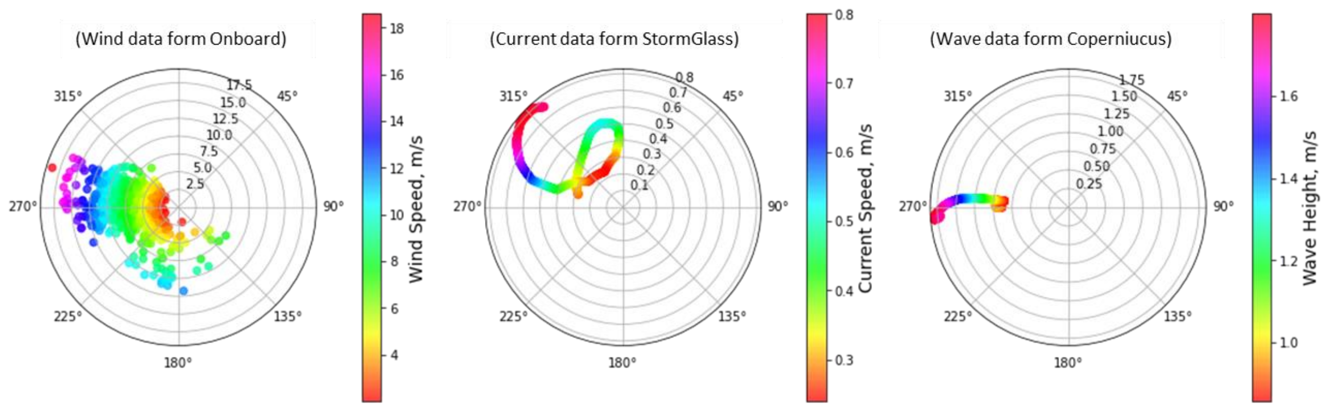
Research Work for Improving the Vessel's Energy Efficiency







Wind, Current, and Wave, 1min-Avg, April 1st 2020



Research

Data Analytics for Improving the Vessel's Energy Efficiency

Descriptive Modeling

Input: Data of vessel's operational and environmental data, from onboard and external sources.

Outcome: Dataset for training and validation the predictive and prescriptive models.

Predictive Modeling

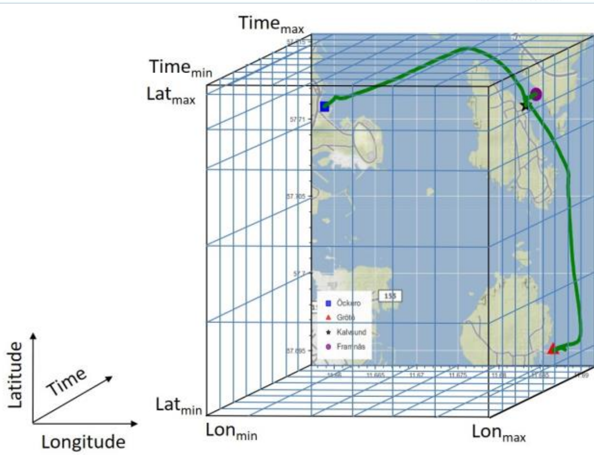
Input: Preprocessed data include operating and weather variables, such as vessel's speed and course, wind, wave, current, etc.

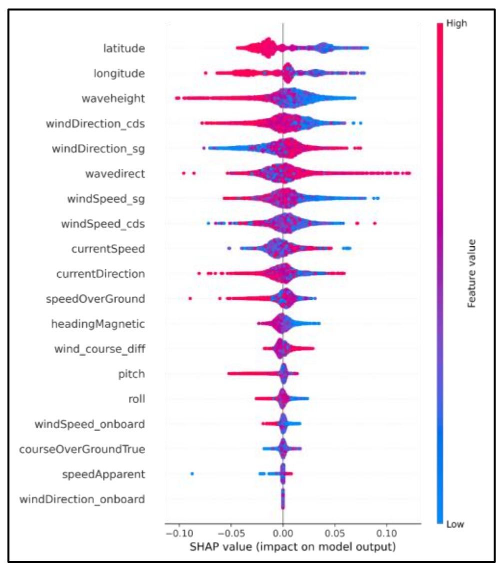
Outcome: Validated predictive models for fuel, distance and time.

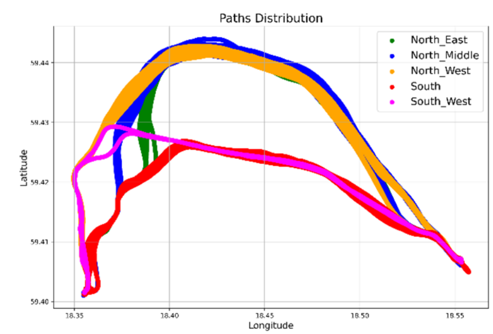
Prescriptive Modeling

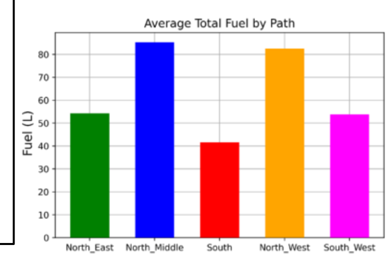
Input: Using solving algorithms, with control variables, such as vessel's speed and course, to find the optimal fuel and time.

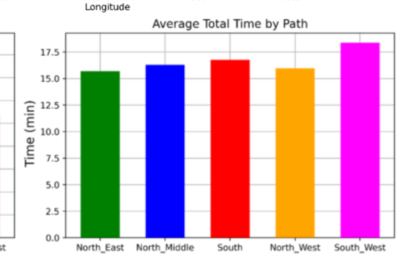
Outcome: Improving fuel consumption and meeting the operational conditions





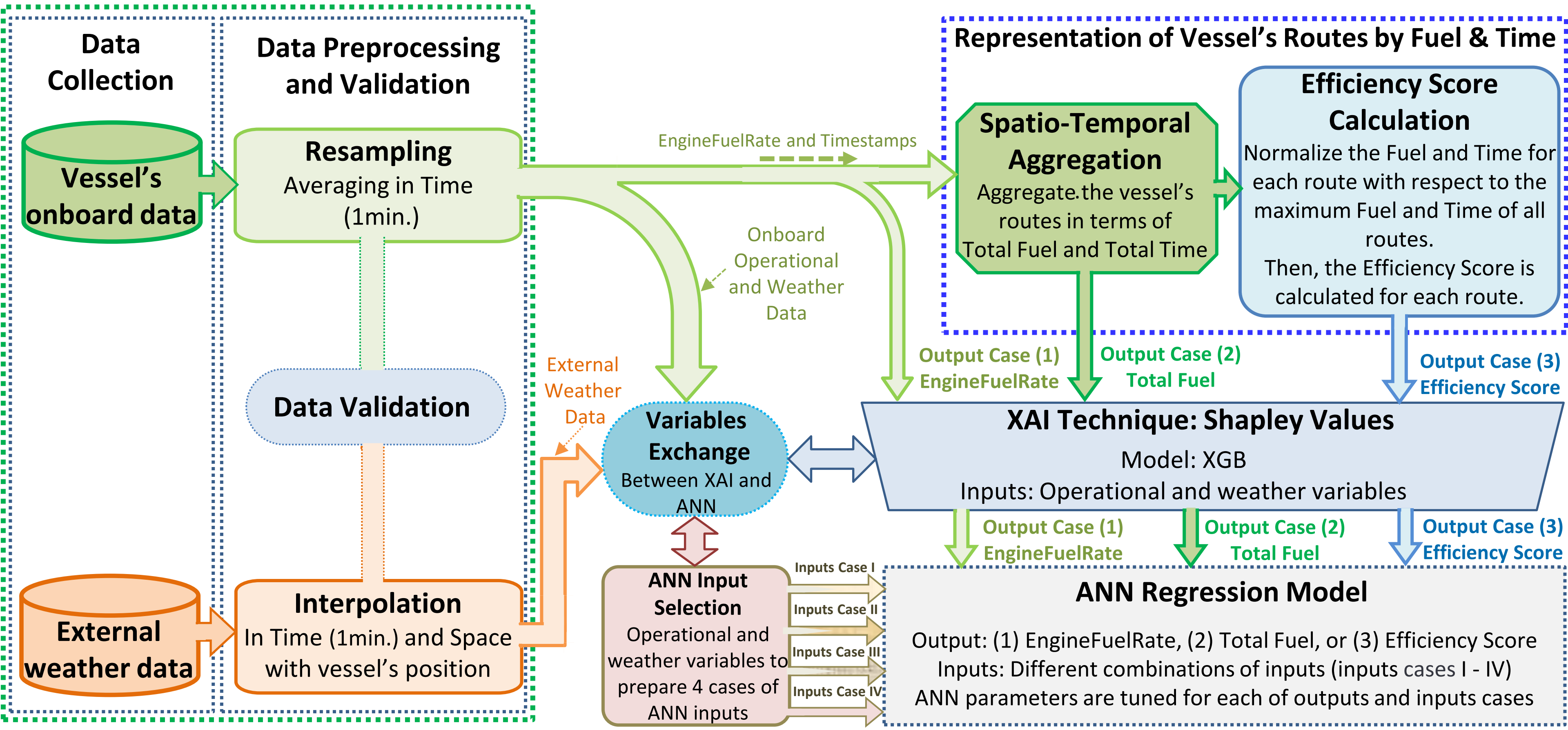






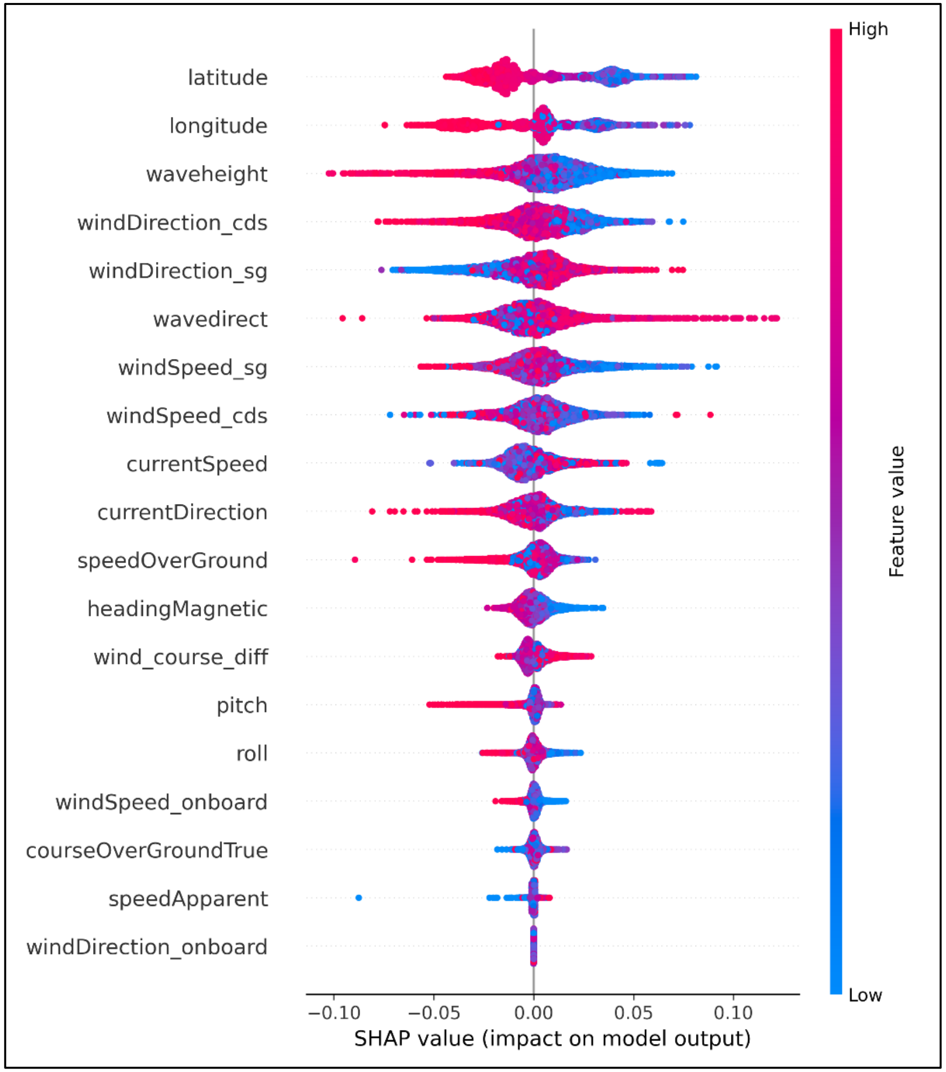
Research

Workflow of Applying XAI for Improving the Vessel's Energy Efficiency



Research

Predictive Analytics



Shapely values for Regression of Eff-Score (Global, where Fuel and Time are normalized based on values of all routes)

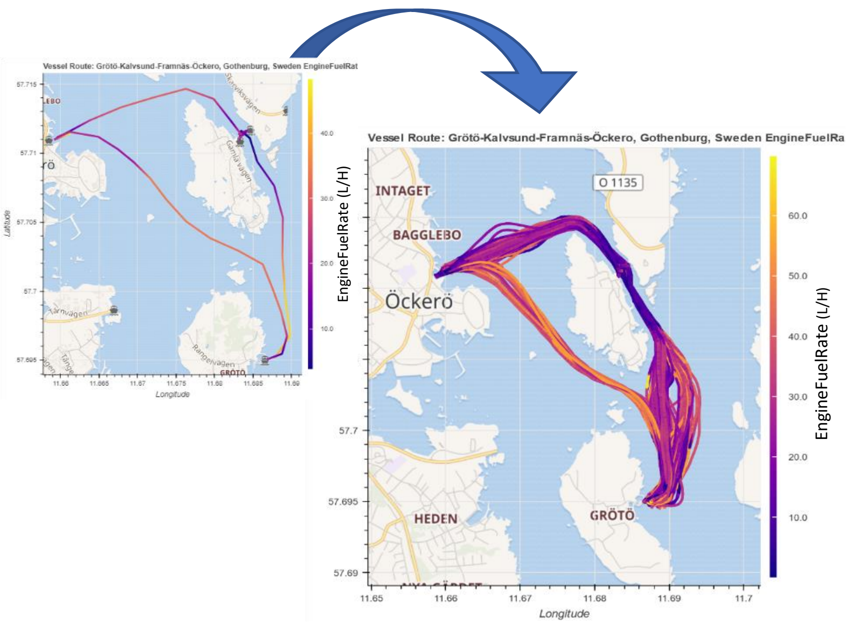
The spatio-temporal aggregation and using the efficiency score (Global) leads to the ***causality***

Research

Predictive Analytics

Effeciency Score

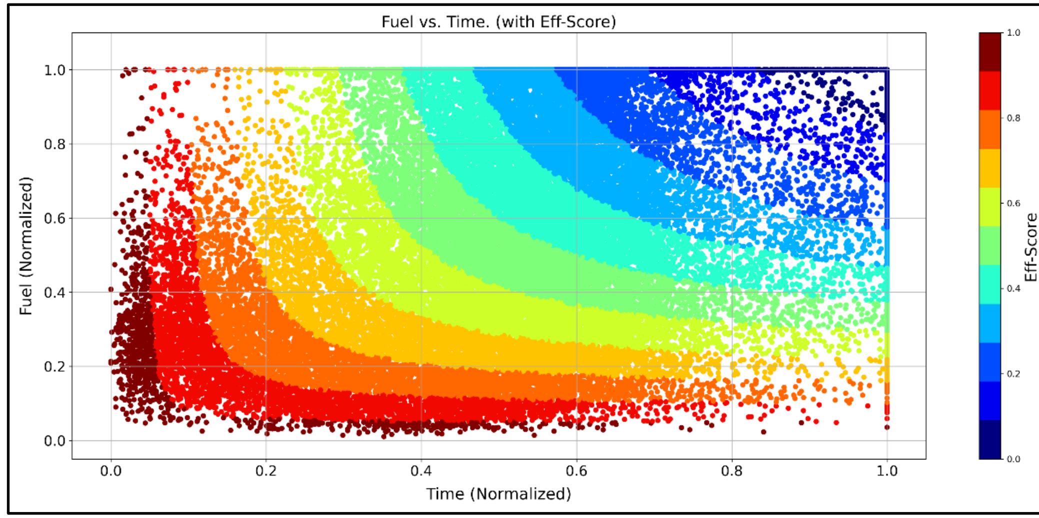
It is calculated once for the entire route.

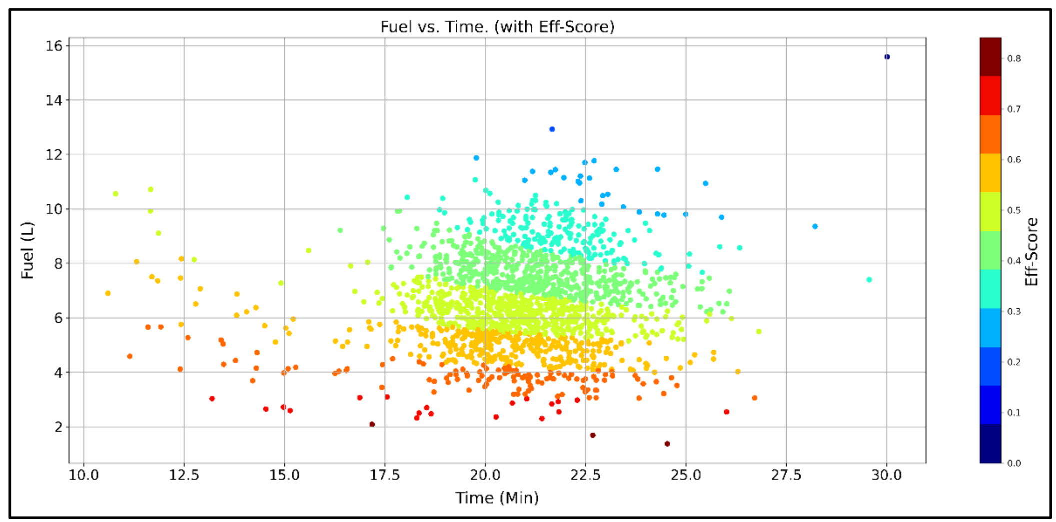


1754 sequences (Routes)

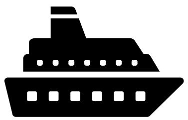
$$Eff_{Cost} = \frac{2*(Fuel\ Total_{norm} * Time\ Total_{norm})}{(Fuel\ Total_{norm} + Time\ Total_{norm})}$$

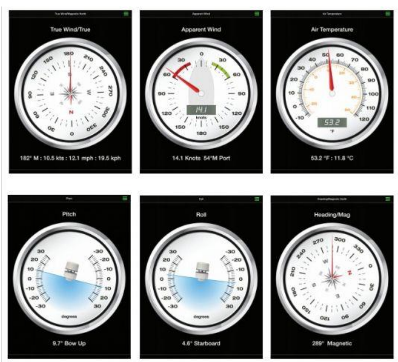
$$Eff_{score} = 1 - Eff_{Cost}$$

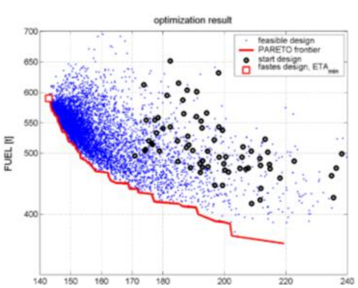




Research







Problem Formulation

Objective Function:
Minimizing the fuel consumption

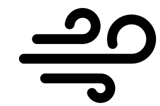
Solutions Finding

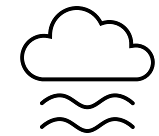
Solving algorithm:
Modeling and managing the engine power at any weather conditions by using a fuel estimation model

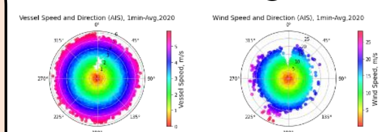
Control variables:
Ship's speed and course

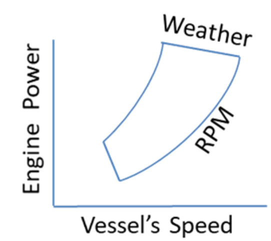
Constraints:
Arrival time, geographic, safety, route smoothness, the ship's roll, and the engine power

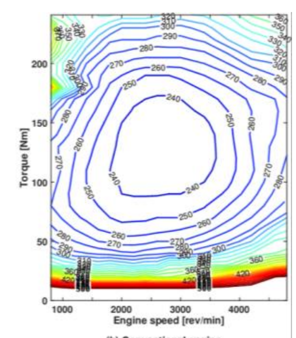
Objective:
Minimum fuel consumption







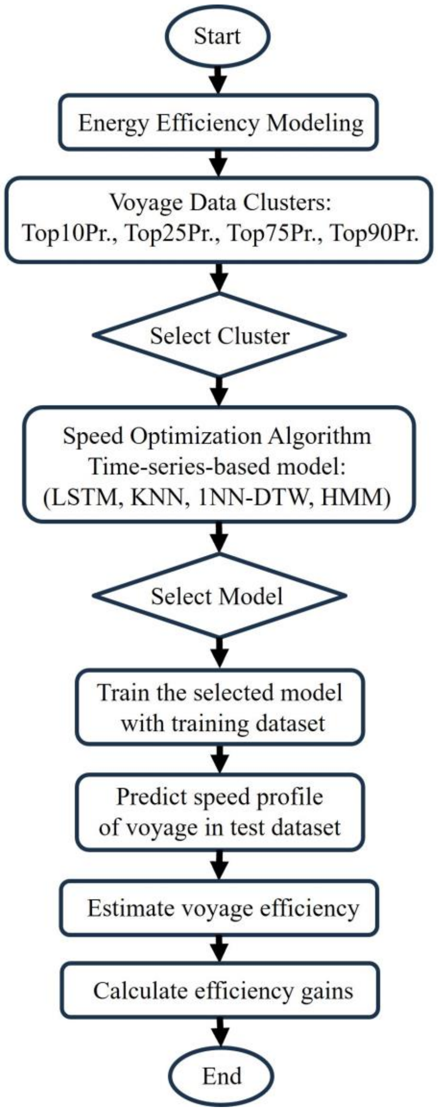


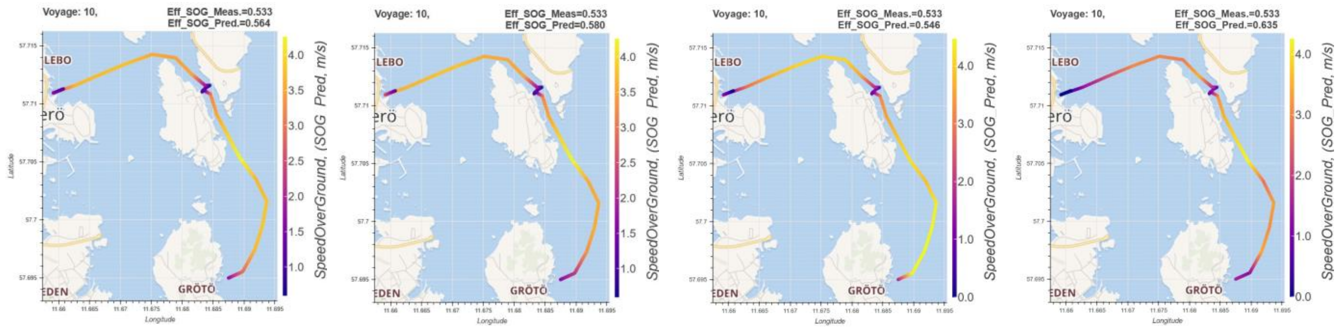


Research

Predictive Analytics

Framework of vessel voyage optimization





(a) LSTM-based model (b) KNN-based model (c) 1NN-DTW-based model (d) HMM-based model

Cluster	Efficiency Score	LSTM	KNN	1NN-DTW	HMM
Top10Pr	Eff. Gains (%)	2.61	2.13	3.20	6.05
	IV Count (#)	134	114	127	139
Top25Pr	Eff. Gains (%)	2.38	1.58	3.23	1.30
	IV Count (#)	129	107	128	107
Top50Pr	Eff. Gains (%)	0.97	0.98	2.58	7.34
	IV Count (#)	100	106	117	140
Top75Pr	Eff. Gains (%)	-0.84	0.50	2.28	9.31
	IV Count (#)	60	93	119	141
Average	Eff. Gains (%)	1.28	1.30	2.82	6.00
	IV Count (#)	105.75	105.00	122.75	131.75

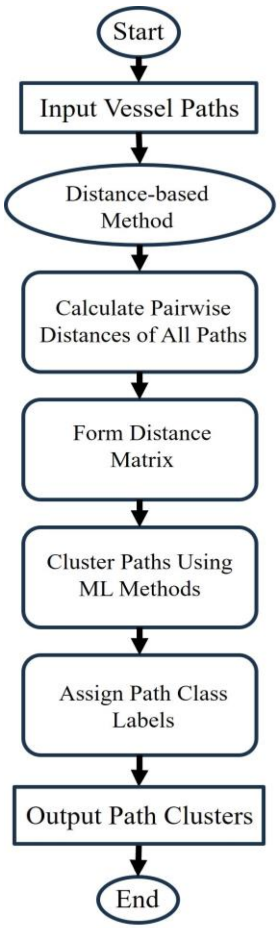
where,

$$Eff._{Gain} = \frac{Eff.Score_{Pred.} - Eff.Score_{Meas.}}{Eff.Score_{Meas.}} \times 100$$

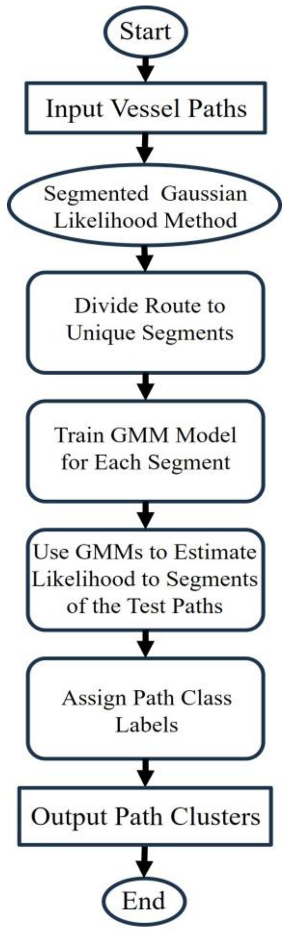
Counts of improved voyages (IV Count#) out of 162 voyages in the test dataset

Research

Spatial Clustering Approach for Vessel Path Identification

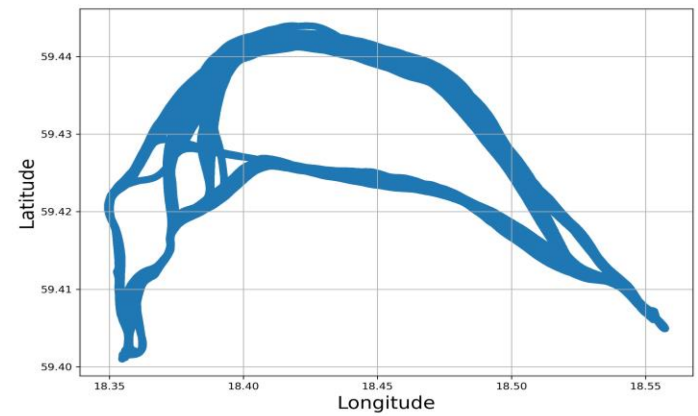


(a)

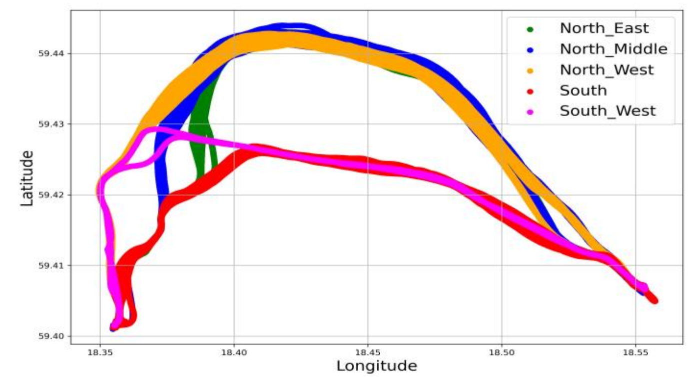


(b)

Framework of vessel path identification.
(a) Flowchart of distance-based method.
(b) Flowchart of segmented Gaussian likelihood method.



The vessel route



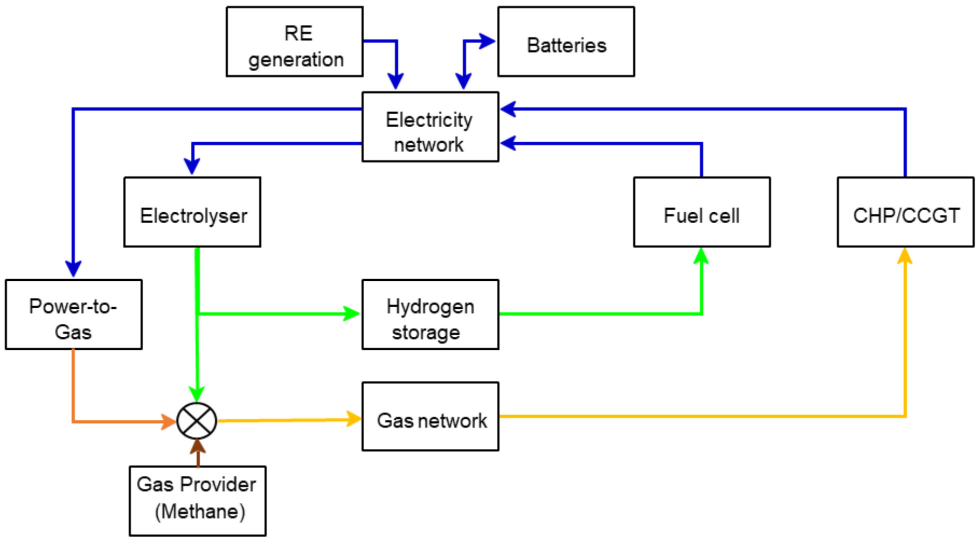
Main classes of path

Research

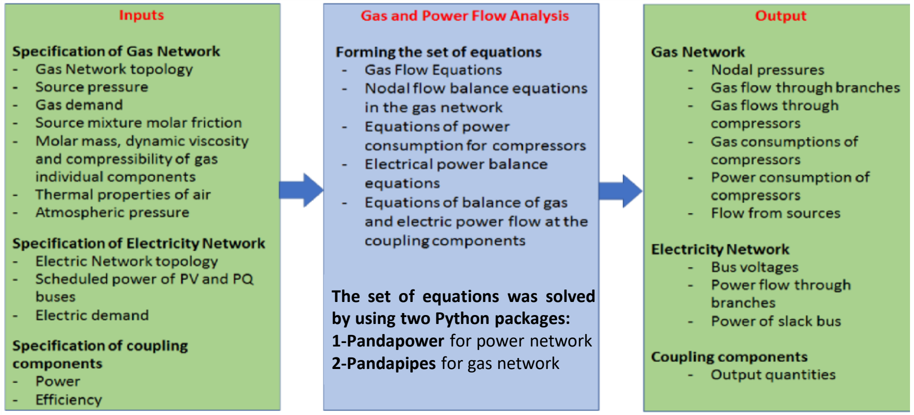
Multi-Energy Model

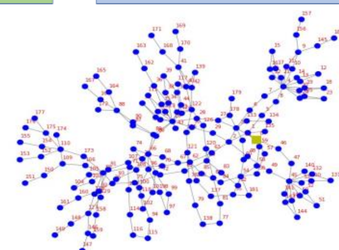
HI ACT: Hydrogen Integration for Accelerated Energy Transitions

Schematic Diagram

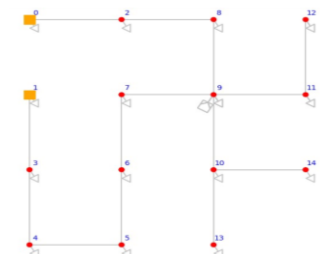


Framework for the Multi-Energy System



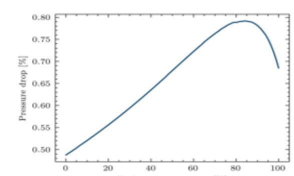


Power Network

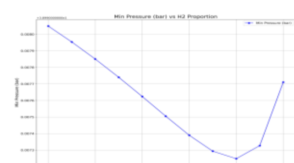


Gas Network

H2_prop	Total_cost	Optimal_q_e	Optimal_q_g	qg_H2	qg_gas	H2_mdot	Gas_mdot	Source_mdot
	(£)	(MWh)	(MWh)	(MWh)	(MWh)	(kg/s)	(kg/s)	(kg/s)
0	10442.183	308.507	2.219	0.000	2.219	0.000	0.152	0.152
0.1	10442.671	308.507	2.269	0.080	2.190	0.002	0.150	0.152
0.2	10443.262	308.507	2.330	0.176	2.154	0.004	0.147	0.152
0.3	10443.994	308.507	2.405	0.296	2.110	0.008	0.144	0.152
0.4	10444.925	308.507	2.501	0.448	2.053	0.011	0.140	0.152
0.5	10446.147	308.507	2.627	0.648	1.979	0.016	0.135	0.152
0.6	10447.824	308.507	2.799	0.922	1.877	0.023	0.128	0.152
0.7	10450.266	308.507	3.050	1.321	1.729	0.034	0.118	0.152
0.8	10454.152	308.507	3.450	1.956	1.494	0.050	0.102	0.152
0.9	10461.302	308.507	4.184	3.124	1.061	0.079	0.073	0.152
1	10478.799	308.507	5.983	5.983	0.000	0.152	0.000	0.152



$$Q = C_{pipe}\sqrt{\frac{P_i^2 - P_j^2 - E}{GZ}}$$



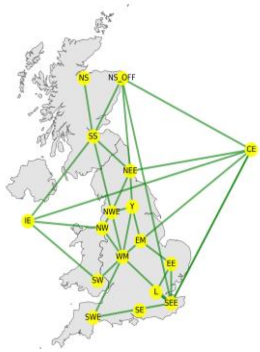
Research

GB's National-Scale Multi-Energy Model

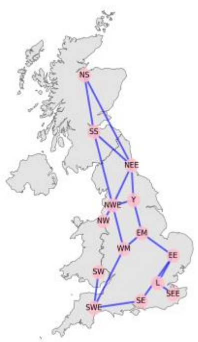
HI ACT: Hydrogen Integration for Accelerated Energy Transitions

The GB's energy system:

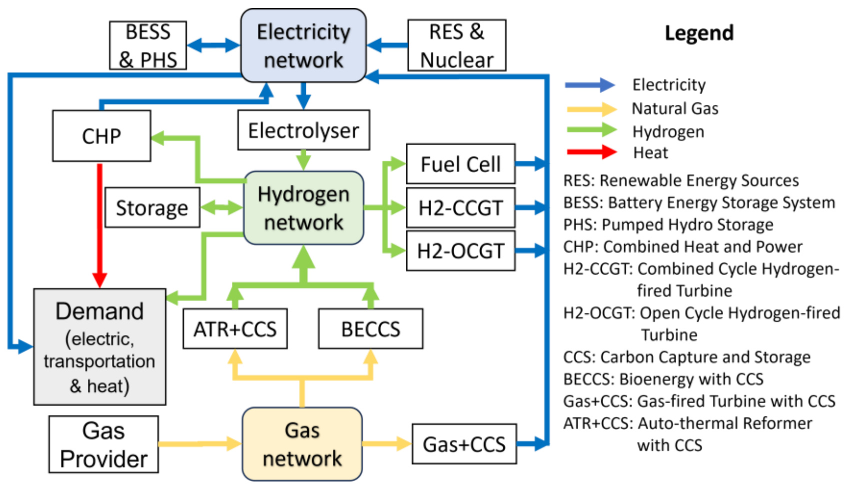
Electricity and gas networks have been built using pandapower and pandapipes in Python.



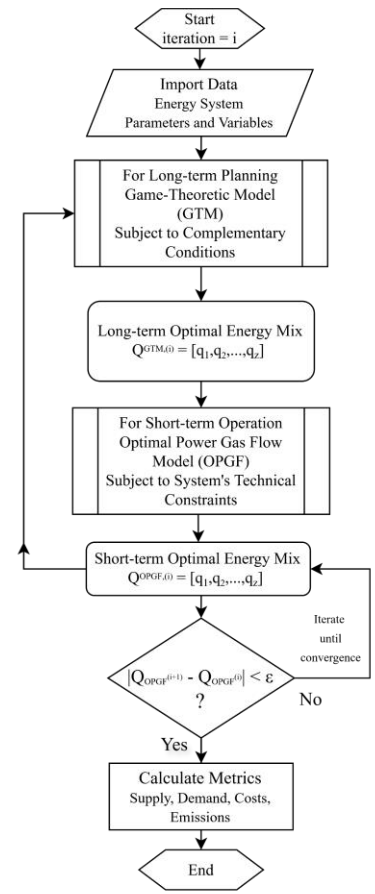
Electricity Network



Gas/Hydrogen Network



Integrated multi-vector energy system framework



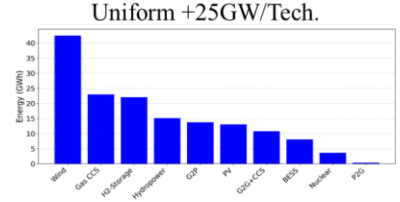
Flowchart for Short-term operation & long-term planning

Results:

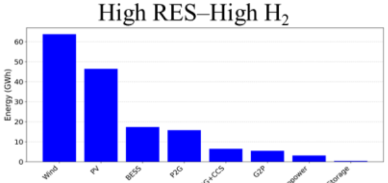
Simulation results for 2050 peak demand under different capacity allocation scenarios.
The electric peak demand is 102.17GWh, while hydrogen peak demand=14.27 GWh.

Metric	Uniform +25GW/Tech.	High RES–High H_2	High RES–Low H_2	High H_2–Low BESS
Total Demand [GWh]	152.51	158.1	117.75	182.75
Electric Demand [GWh]	119.2	136.22	103.1	149.44
Hydrogen Demand [GWh]	33.31	21.88	14.65	33.31
Total Energy Supply [GWh]	152.51	158.1	117.75	182.75
Total Operational Cost [£]	870,046	862,128	581,663	979,281
Total CO_2 Emissions [Tonnes]	734	0	0	0

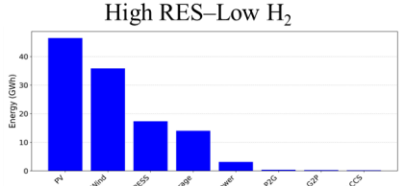
Uniform +25GW/Tech.



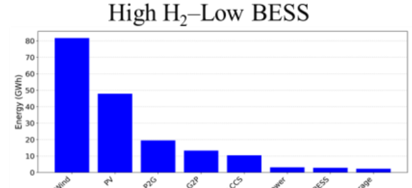
High RES–High H_2



High RES–Low H_2

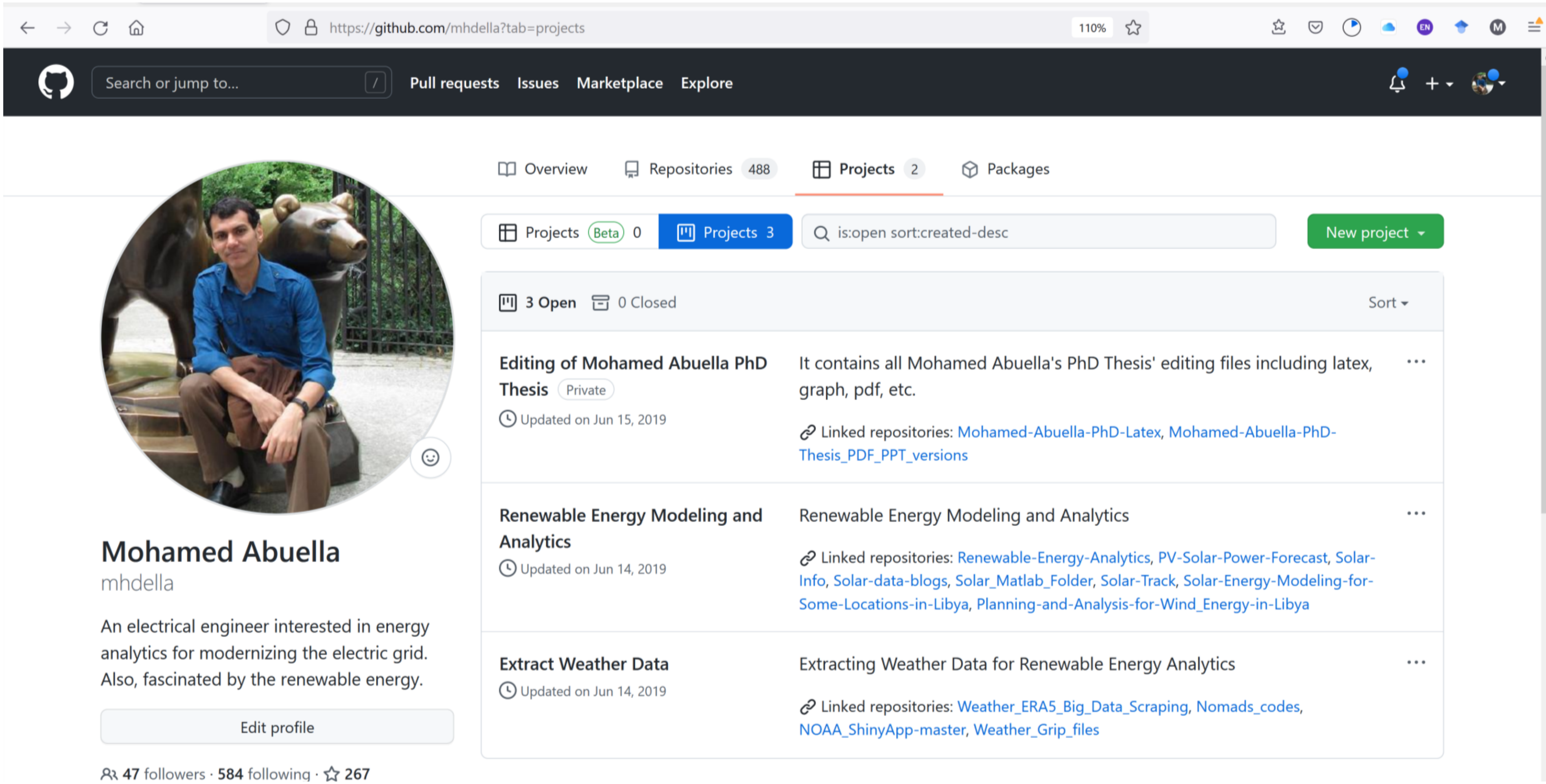


High H_2–Low BESS



Research (Miscellaneous)

Some other Projects in GitHub: https://github.com/mhdella?tab=projects



Research (Miscellaneous)

Keep up some blogs on : https://mohamedabuella.github.io/blog/

Blogs

09 Jun 2025 » Blog Interactive Levelized Cost of Thermal Energy (LCOT) Calculator

06 May 2025 » Blog Decarbonizing Residential Heating in the North of Tyne

06 Apr 2025 » Blog Interactive Tool for Long-Term Planning of Different Energy Assets

04 Apr 2025 » Blog Profit Allocation in a Simple Energy System Using Cooperative Game Theory

05 Oct 2024 » Blog Hydrogen Blending for Sustainable Energy: A Case Study in the North of Tyne Region

01 Jun 2024 » Blog Hydrogen Integration: Lessons from Solar Energy Integration

24 Mar 2024 » Blog iHelm Project: Data Analytics for Improving Energy Efficiency in Short Sea Shipping

05 Feb 2024 » Blog Tools for Energy Systems Modeling and Analysis

23 Dec 2023 » Blog Systematic Analysis of Mendeley Documents with ChatGPT as a Coding Utility

06 Dec 2023 » Blog iHelm Project: Data Analytics for Improving Energy Efficiency in Short Sea Shipping

06 Dec 2023 » Blog Data Analytics for Vessel Path Planning in Short-Sea Shipping

06 Dec 2023 » Blog Data Analytics for Improving Energy Efficiency in Short-Sea Shipping

15 Dec 2021 » Blog Using pandapower for Modeling and Analysis of Energy Systems

01 Sep 2021 » Blog Planning and Analysis for Wind Energy in Libya

19 Jul 2021 » Blog Planning and Analysis for Solar Energy in Libya

11 Dec 2019 » Blog Reading and Reflection on a Book of Solar Energy

19 Aug 2019 » Blog Does the Educational Curricula Keep the Pace with the Advancements in Energy ..?

09 Aug 2019 » Blog Wind and Solar Energy Resources Modeling and Analysis

30 Jul 2019 » Blog Net Load Forecasting for Microgrid Resiliency

29 Jul 2019 » Blog How a Subtle Lack of Knowledge Could Lead to Catastrophic Consequences

23 Jun 2019 » Blog Reading a Big-picture Book after a While of Focusing on Elaborate Technical Stuff

17 Jun 2019 » website Website Launched

Research (Miscellaneous)

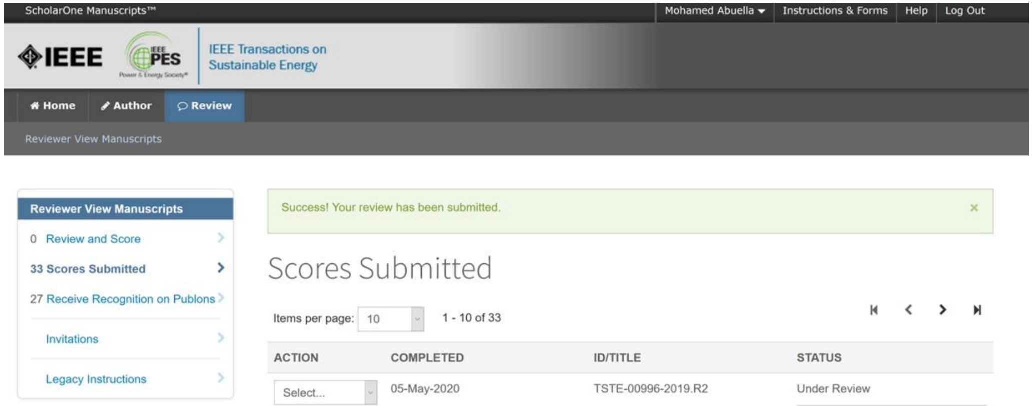
- Power System Flexibility and DG resources management, I have been working on Forecasting and Machine Learning approaches, since 2014

- Techno-economic analysis of HOMER, NREL SAM, and PVLib Toolbox for Python.

- Writing using Latex (Eqs, Biblio.), Mendeley (~14000 docs, tags), Evernote (organize notes, share them), Dropbox, Google Drive (clouds to back up), iCalendar, etc.

- Research Outreach and Knowledge Dissemination: depending extensively on the online tools, such as Blogs on personal website, LinkedIn, Twitter, Researchgate, Newsletter from relevant groups of interest (ESIG, AI in Smart Grids, ISES, WEMC, etc.)

- Review of IEEE Transactions on Sustainable Energy



Thanks for Your Listening

Any Question?

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mhdabuella@gmail.com