Jorge MONTALVO ARVIZU

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Research engineer working at the intersection of **artificial intelligence** and **power systems** to help achieve a world powered by clean energy and fight the climate change crisis. I am particularly excited about the use of *graph neural networks, reinforcement learning,* and *causality* on the power grid of the future. I enjoy volunteering at a global climate change-focused non-profit (CCAI) in my free time.

EDUCATION

2019 - 2021	M.Sc. in SUSTAINABLE ENERGY | Study line: Electric Energy Systems **Technical University of Denmark (DTU)**, Denmark **(Pending) Thesis:** Towards an Artificial Grid Operator Assistant: Congestion Risk Assessment Indices for Model-based Agents GPA: 10/12
2012 - 2017	B.Sc. in MECHANICAL and ELECTRICAL Engineering **Monterrey Institute of Technology and Higher Education (ITESM)**, Mexico GPA: 90/100
WINTER 2016	Exchange Semester in ELECTRICAL Engineering **Ostfalia University of Applied Sciences**, Germany

WORK EXPERIENCE

CURRENT	CENTRICA - Antwerp, Belgium (Hybrid) *Research Engineer [full-time]* Developing and implementing demand response solutions using state-of-the-art machine learning models and operations research. Heavily focused on data-driven control techniques for scalability on distributed assets, e.g., data-driven frequency response with households using EVs, heat pumps, PV, and batteries.
CURRENT	FLORIDA FINANCIAL MANAGEMENT LLC - Florida, US (Remote) *Machine Learning Engineer [full-time]* I manage the whole data science pipeline using MLOps to research, design, and implement machine learning algorithms supporting the operations of the company focusing on the business side. Most tasks relate to loan classification and financial decision-making.
2022	SOLARIO - Monterrey, Mexico *Machine Learning Engineer [full-time]* I led the design, implementation, monitoring, and deployment of several load and electricity price forecasting models, as well as a power procurement model based on stochastic optimization, to operate on the day-ahead and real-time markets of the short-term Mexican Wholesale Electricity Market.
2021	RÉSEAU DE TRANSPORT D'ÉLECTRICITÉ (RTE) - Denmark/France *Intern [full-time]* Master's thesis collaboration between the ELMA group at DTU and the AI department at RTE. Focused on learning a risk assessment model to provide information about possible congestions in the power grid to a Deep Reinforcement Learning agent based on a cyber-physical system with complex automata.
2019 - 2021	EA ENERGIANALYSE AS - Copenhagen, Denmark *Student Assistant [14 hrs. per week]* Analysis of energy systems from a technical, economic and environmental approach, as well as analysis of energy and climate policy measures, using mathematical optimization. Part of the innovation group on machine learning applications for power systems.

2017 - 2019	NERA ECONOMIC CONSULTING Inc. - Mexico City, Mexico
	Associate Analyst [full-time] (Promoted from Research Associate in 2018)
	Support in the quantitative and regulatory analysis of the Mexican and international energy markets to private and public stakeholders, i.e., Energy Regulatory Commission, Energy Ministry, Gas System Operator. I was mainly involved in the modelling of the energy system of each project, e.g., PLEXOS modelling of the national network to forecast natural gas demand for the energy regulatory commission in Mexico to create the government's investment plan for the next 20 years.
SPRING 2016	DNV GL AS - Bonn, Germany
	Energy Markets and Regulation Intern [full-time]
	Provided analytic support to a highly experienced international consulting team working on a Bidding Zone Study for ENTSO-E, as well as an internal project on the simulation of the European natural gas market.

TEACHING EXPERIENCE

2020	**Technical University of Denmark**, Denmark
	TEACHING ASSISTANT - Modelling and Analysis of Sustainable Energy Systems using Operations Research
	The course introduces the basics of **optimization with mathematical programming**, the application to energy system modelling, and software implementation. I created several notebooks in Julia/Pluto to better explain the complex concepts to the students.	Notebooks/Code

SOFTWARE AND COMPUTER SKILLS

Languages	**Python**, **Julia**, SQL, GAMS, R, MATLAB, LaTeX
DL	**Pytorch**, PYOMO, PYRO/NUMPYRO (PPL), TensorFlow
Electrical	**PLEXOS**, PowerFactory, and PowerWorld
MLOps	DVC, Hydra, MLFlow, BentoML, Airflow
Misc.	Linux (BASH), Git, Tableau, Docker

PROFESSIONAL PROJECTS

2022	Multi-agent RL for renewable integration in the electric power grid [paper]
	Collaborators: **Mila, Université de Montréal** and **Polytechnique Montréal, GERAD**
	A collaborative multi-agent reinforcement learning approach to meet the algorithmic requirements for providing real-time power balancing with demand response. Presented at RL4RealLife workshop at NeurIPS 2022.
SINCE 2021	RANGL [website]
	Collaborators: **Alan Turing Institute**
	RangL is a competition platform created at The Alan Turing Institute based on OpenAI Gym. It offers a user-friendly environment to develop learning approaches to data-driven control problems, e.g. generation scheduling under uncertainty. The project is led by Professor John Moriarty from QMUL.

PROFESSIONAL ACTIVITIES

SINCE 2022	Core team member at global non-profit CLIMATE CHANGE AI. I lead a **Power Systems Working Group** with industry professionals and researchers. Reviewer for CCAI's workshop "Tackling Climate Change with Machine Learning" at several iterations of NeurIPS and ICLR.
SINCE 2022	Reviewer for the International Conference on PROBABILISTIC METHODS APPLIED TO POWER SYSTEMS (PMAPS), and POWER SYSTEMS COMPUTATION CONFERENCE (PSCC)
SINCE 2015	Member of the Institute of Electrical and Electronic Engineers (IEEE) and IEEE Power and Energy (PES) Society

LANGUAGES

GERMAN	Intermediate - GOETHE-ZERTIFIKAT B1
ENGLISH	Fluent - TOEFL IBT 109/120
SPANISH	Native