EMMANUEL ANIOS FILS MOMPREMIER

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EDUCATION

KTH Royal Institute of Technology, *Stockholm, Sweden* Sep 2021 - Jul 2023
Université de Lorraine, *Nancy, France*
Degree: ***Joint Master in Decentralized Smart Energy Systems***
Achievements & Awards: Erasmus Mundus Scholarship (2021 - 2023)
Master Thesis: A Methodology for End-to-End Digitalization of Battery Cell Production

National Taiwan University, *Taipei, Taiwan* Sep 2017 - Jul 2021
Degree: ***Bachelor of Science in Mechanical Engineering***
Achievements & Awards: MOFA Taiwan Scholarship (2017 - 2021), Presidential Award (top 5% of class, 2021)

SKILLS

Programming:	Python (NumPy, Pandas, Matplotlib, Pyomo, Tkinter, Streamlit, scikit-learn, Keras, TensorFlow), SQL, MATLAB/Simulink, OpenModelica, HTML/CSS
Software Tools:	Git, Bitbucket/Github, Jupyter Notebook, Atlassian Suite (Confluence, Jira), Excel, Power BI, Tableau, Kafka, Grafana
Other Skills:	Mathematical Optimization, Data Analytics, OPC UA, Data Modelling, Machine Learning, Deep Learning, Technical Writing, Public Speaking
Certifications:	Deep Learning Specialization (Coursera), Student Leadership in Renewable Energy (IRENA), Design Thinking, Strategy & Innovation (ESADE)
Languages:	Haitian-Creole (native), French (native), English (fluent), Mandarin (advanced), Spanish (advanced), German (basic)

WORK EXPERIENCE

BMW Group, Munich, Germany Jan 2023 – Jul 2023
Internet-of-Things and Data Analytics Intern
- Collaborated with IT & process engineers using digital twin tech, PLCs and edge devices to commission battery cell manufacturing equipment and optimize data transfer efficiency
- Built machine-to-cloud data pipelines with OPC UA, Kafka and cloud services to store large timeseries data
- Designed real-time dashboards using Grafana and Power BI for monitoring battery cell production performance
- Created thorough project documentation using JIRA & Confluence to facilitate the onboarding of new team members

Advanced Skills: Data Engineering, Data Modelling, OPC-UA, Grafana, Kafka, JSON, Python, JIRA, Confluence

Laboratoire Lorrain de Recherche en Informatique et ses Applications (LORIA), Nancy, France Jul 2022 – Aug 2022
Co-Simulation Summer Intern
- Updated the model of an EV powered by fuel cells and supercapacitors, adding rigorous physical constraints and increasing the model's accuracy by 20%
- Wrote 500+ lines of code to integrate trajectory, physics of the engine and driver behavior into the EV simulation, resulting in an improvement in simulation speed
- Co-simulated the subsystems developed in Modelica using Python/FMUs to determine the time variation of the SCs' SOC

Advanced Skills: Software Engineering, Python, Modelica, Algorithms, FMI/FMU, Modeling of Electric Vehicle, Research

First Code Academy, Taipei, Taiwan Jun 2021 – Aug 2021
STEM and Coding Instructor
- Led 30+ students aged 7-15 in online coding bootcamps, boosting their coding interest & achieving 95% satisfaction rate
- Guided students to create personal projects and provided their parents with prompt feedback on the learning progress
- Covered programming topics included Python, HTML, CSS, Roblox Studio (Lua), MIT App Inventor and Scratch

Advanced Skills: Programming, Teaching, Communication, Teamwork, Time Management, Adaptability

Industrial Technology Research Institute (ITRI), Hsinchu, Taiwan Jul 2019 – Aug 2019
International Marketing & Communication Intern
- Collaborated with technical experts to edit and review ITRI's annual report and research project updates
- Conducted user market research and wrote publications to improve international outreach and company recognition

Advanced Skills: Technical Writing & Presenting, Expert Interviews, Research, Team Collaboration

PROJECTS

EV Charging Station Controller *(Skills: Python, Pyomo, Mathematical Optimization, MILP)*
- Developed a MILP optimization model with Python, Pyomo and CBC solver for efficient charging of an EV pool
- Implemented a controller with SOC and power flow constraints achieving 98.48% accuracy in charging predictions
- Used Python to design dashboards allowing to monitor the station performance

Energy+ (*Skills: Python, Tkinter, NumPy, Pandas, Matplotlib, Data Analysis*)
- Programmed an energy management app reducing residential energy consumption by 30% via behavior-based design
- Utilized Python, Tkinter, OpenWeatherMap APIs and third-party structured data to create the app
- Conducted data analysis using NumPy, Pandas and Matplotlib to evaluate energy savings

Propeller-Driven Autonomous Robot Car (*Skills: Programming, Automatic Control, CAD Design*)
- Managed team of 5 to build a propeller-driven car with autonomous abilities for line tracing and obstacle avoidance
- Designed and implemented sensor-integrated control system using Arduino (C Programming) with a budget under €100
- Achieved target speeds and reduced robot car body weight by 10% lower than average during final relay

Point & Quantile PV Generation Forecasts (*Skills: Machine Learning, Data Modeling, Python, scikit-learn*)
- Developed ML models to forecast PV generation from irradiance and temp. data, achieving test set errors <10%
- Fine-tuned hyperparameters of scikit-learn models (MLR, MLP, GBR) to optimize MAE, RMSE, and CRPS metrics
- Generated both point and quantile forecasts for accurate prediction of PV generation for the solar plant

Demand Management for Off-Grid Industrial Applications (*Skills: Data Analysis, Load Shedding, Python, MATLAB*)
- Devised a load shedding strategy to minimize power outages and delays, resulting in preventing downtime up to 30 mn
- Engineered a MATLAB/Simulink-based controller that balances power demand and generation within 10 milliseconds
- Validated the controller's effectiveness by testing on datasets from a real industrial grid and measuring key performance indicators (KPIs) such as frequency deviation, voltage stability and active power delivered
- Implemented dashboards using Python & Streamlit to visualize controller's performance on the KPIs

Optimal Sizing of Microgrids (*Skills: Genetic Algorithm, Optimization, Renewable Energy Systems*)
- Developed a microgrid system with PV and BESS for a football stadium to sell excess electricity to the main grid
- Optimized the size of the PV panels and battery cells using genetic algorithm resulting in 181 panels and 2589 cells with an initial SOC of 62%
- Achieved a total cost of €1.82 million, yearly revenue of €1.15 million, and payback period of approximately 19 months with the optimized system

VOLUNTEERING & EXTRACURRICULAR ACTIVITIES

National Taiwan University (NTU) – Office of International Affairs, *Taipei, Taiwan* Sep 2019 – Jul 2021
Student Ambassador
- Coordinated student-led events and welcomed foreign delegations, demonstrating effective communication and collaboration skills
- Led a team of 3 to create NTU's first International Freshmen Student Handbook, benefiting 1000+ students and improving their orientation week experience

Advanced Skills: Team Leadership, Project Management

International Companion for Learning (ICL), *Taipei, Taiwan* Sep 2017 – Jul 2021
Instructor
- Hosted weekly Skype sessions to instruct primary and middle school Taiwanese students in intercultural exchanges, showcasing effective teaching and communication skills
- Devoted 55 service hours per semester to teaching, training, school visits, and assessment, demonstrating strong work ethic and dedication to the success of the students

Advanced Skills: Communication, Collaboration, Digital Work Environment