# Edward Quarm

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## CAREER SUMMARY

Applied mathematics data scientist specialized in AI, ML, CV and numerical optimization. I possess 5 years' experience in developing end-to-end data science solutions from cloud REST API data ingest to user tools.

## RELEVANT SOFTWARE SKILLS

Oracle Cloud Infrastructure (Data Warehouse, APEX, OML4PY, OCI functions, SQL), RNNs, CNNs, PyTorch, TensorFlow, Scikit-Learn, MATLAB, Gurobi & IBM ILOG CPLEX , CVXPY, MATLAB CVX, PYOMO, MOSEK.

## PROFESSIONAL EXPERIENCE

**XEROX CORP., Cary, NC**
*Data Scientist (Print Quality & Systems Integration), January 2022 - Current*

- Doubled productivity of print quality analysis team by automating ingest of print quality data (image and csv) to Oracle Cloud Infrastructure Object storage using REST API endpoints.
- Developed algorithm for anomaly detection of 3D printer IOT sensor data using RNN Long Short-Term Memory (LSTM).
- Doubled productivity by developing logging Application for recording mechanical faults and quality defects in print process to calculate Operational Equipment Efficiency (OEE) using Oracle Application Express (APEX)
- Presented monthly analysis of printer OEE metrics to Technical Program Managers.

**PACIFIC NORTHWEST NATIONAL LABORATORY, Richland, WA**
*Analytics Intern, June 2021–September 2021*

- Designed and implemented stochastic scheduling optimization algorithm for multi-scenario contingency on grid network using large dataset which is 10x faster than Gurobi & CPLEX.
- Developed a faster and highly efficient python algorithm to minimize operations costs and network losses subject to system constraints on sparse datasets.
- Developed the 1st SDP implementation of stochastic multi-scenario optimization problem in the Energy group.

**ENSTOA INC., New York, NY**
*Machine Learning Intern, June 2019–August 2019*

- Developed and implemented learning algorithm to train CNN in identifying objects such as walls, windows, rooms etc. in thousands of 2D rasterized floor plans for clients in the construction industry using PyTorch and Opencv.
- Developed efficient python code for objective and constraints in a project scheduling optimization problem for clients in the construction industry to maximize profits. Code performed 5x times faster than previously developed.

**UT ARLINGTON, Arlington, TX**
*Research Assistant, June 2017–June 2021*

- Published 5 articles in top IEEE journals on topics: mathematical optimization, nonlinear programming, mixed-integer programming, machine learning, statistics and systems control.
- Developed faster and highly efficient python algorithm to reformulate Mixed-Integer Program (MIP) to Semidefinite Program (SDP) which performed 10x faster than CPLEX and GUROBI solvers for large-scale problems.

## EDUCATION

**University of Texas at Arlington, Arlington, TX**
*Ph.D., Electrical Engineering, December 2021(Expected)*
Research Focus: Massively Scalable Optimization Methods for uncertainty scheduling in Electricity Markets

**Universite Grenoble Alpes, Grenoble, FRANCE**
*MSc., Systems Control and Information Technology, November 2016*
Research Focus: Robust Multivariable Control of a HIL simulation for a 4MW system test bench for wind turbine

**KNUST, Kumasi, GHANA**
*BSc., Electrical & Electronics  Engineering, July 2013*

## RELEVANT PROJECTS

- Computer Vision image prediction using Keras on MNIST dataset (Repo: https://tinyurl.com/CNNdigits)
- Anomaly detection using machine Learning (Repo: https://tinyurl.com/anomalyML)
- ML prediction and Regularization algorithms on dataset (Repo: https://tinyurl.com/MLalgorithms)

## PUBLICATIONS

- **E. Quarm Jnr.,** X. Fan, M.A. Elizondo, and R. Madani. "Proactive Posturing of Large Power Grid for Mitigating Hurricane Impacts." – Accepted for publication in 2022 IEEE PES Conference on Innovative Smart Grid Technologies (ISGT 2022).
- **E.Quarm Jnr** and R. Madani, "Scheduling under transient uncertainty via cone programming relaxation" – In preparation for publication in IEEE Transactions on Power systems
- **E. Quarm Jnr** and R. Madani, "Scalable Security-Constrained Unit Commitment under uncertainty via cone programming relaxation"- IEEE Transactions on Power systems, vol. 36, no. 5, pp. 4733-4744, Sept. 2021
- **E. Quarm Jnr**, F. Zohrizadeh and R. Madani, "A Scalable Computational Method for Security-Constrained Unit Commitment with Energy Storage" Abstract presented at INFORMS Annual Meeting 2018
- F. Zohrizadeh, M. Kherandishfard, **E. Quarm Jnr** and R. Madani, "Penalized Parabolic Relaxation for Optimal Power Flow Problem" 57th IEEE Conference on Decision and Control, 2018