Nathalie Uwamahoro

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EDUCATION

Syracuse University — Syracuse, NY, USA
Ph.D., Electrical and Computer Engineering — Aug, 2022 - May, 2027 (Expected)
Advisor: Dr. Sara Eftekharnejad

Carnegie Mellon University - Africa campus — Kigali, Rwanda
M.S., Electrical and Computer Engineering — Jul, 2018 - Dec, 2019

University of Rwanda — Kigali, Rwanda
B.S.,Electrical Engineering Second Class Honors, Upper Division — Jul, 2013 - May, 2017

SKILLS

- **Theory**: Machine Learning, Reinforcement Learning, Computer Vision, Optimal Power Flow, Probabilistic Power Flow, Uncertainties Modeling, Topological Data Analysis
- **Microsoft Office**: Excel, Power Point, Outlook, Word
- **Programming Language**: Python, MATLAB,
- **Toolkit**: Git, MySQL, NetworkX, Pytorch, Numpy, Scipy, Sklearn, OpenCV, Networkx, Giotto-TDA, Linux

RESEARCH INTERESTS

- Fault detection, diagnosis, and predictive maintenance using machine learning
- Topological data analysis and its applications in high-dimensional data modeling
- Optimal resource allocation in smart systems leveraging AI and optimization techniques

RELEVANT EXPERIENCE

National Institute of Statistics of Rwanda — Kigali, Rwanda
Data Science Team Leader — Jul, 2021 – Jul, 2022
- Accelerated data transformation by leading Data Scientists in Data Revolution and Big Data Department.
- Enhanced national insights via Python scripts analyzing web-scraped economics data, enabling data-driven decisions.
- Strengthened collaboration with the UK's Office for National Statistics, sharing data science expertise and best practices.

Carnegie Mellon University — Kigali, Rwanda
Research Assistant — Jun, 2021 – Aug, 2022
- Researched the impact of the Covid-19 Stringency Index in Africa, analyzing economic and social effects - A Data-Driven Approach.
- Contributed to the development of a Covid-19 dashboard, enhancing data visualization and public access to critical health statistics across the African continent.

Hitachi Research and Development — Tokyo, Japan
Industrial Researcher Intern — Jun, 2019 – Aug, 2019
- Boosted photovoltaic micro-grid efficiency within 3 months by reprogramming a Maximum Power Point Tracking (MPPT) system in C.
- Expanded strategic opportunities by coordinating business meetings with Hitachi's industrial partners to discuss project developments and collaborations.

East African Power — Kigali, Rwanda
Solar Engineer and Data Analyst Intern — Jan, 2020 – Jun, 2020
- Boosted Return on Investment on renewable investments by designing photovoltaic on-grid systems and conducting comprehensive financial analyses.
- Enabled entry into green finance initiatives and aligned with COP26 goals by researching renewable energy carbon credit strategies for East African Power Company.

Energy Development Corporation Limited — Kirehe, Rwanda
Project Engineer Intern — Aug, 2020 – Oct, 2020
- Increased infrastructure reliability across 14 villages by ensuring quality control during medium and low-voltage transmission line construction.
- Streamlined data management and access by digitizing over 1,000 customer records for households receiving power meters.

Pfunda Tea Factory Rubavu, Rwanda
Electrical Engineer Intern May, 2017 – Sept, 2017
- Increased plant efficiency and reduced downtime by monitoring and optimizing electrical machine performance.
- Enhanced operational reliability by installing and configuring two motors with a star-delta connection.

HONORS AND AWARDS

Paper Awards
North American Power Symposium (NAPS) 2023: First Place for Best Graduate Paper "A Comparative Study of Data-Driven Power Grid Cascading Failure Prediction Methods..."

Achievements and Recognitions
- Teaching Mentor for new Teaching Assistants, Syracuse University (2024 and 2025)
- Represented the Electrical Engineering and Computer Science Department of Syracuse University at the Tapia Conference, San Jose, CA, US (2024)
- Selected by CMU-Africa to complete the final semester at CMU Pittsburgh, USA (2019)
- Bachelor of Science in Electrical Engineering, Second Class Upper Division, University of Rwanda (2017)
- Nominated by the University of Rwanda to apply for a Master's in Aerospace Engineering at Cranfield University at the request of the Rwandan Presidency (2017)
- Selected by the University of Rwanda to attend the Smart Africa Congress (2017)
- Selected by University of Rwanda for IEEE Power System Protection Training (2017)

Scholarships and Fellowships
- PhD Summer Fellowship, Syracuse University (2024)
- Grace Hopper Celebration Europe, Middle east and Africa 2021 Scholarship (2021)
- Grace Hopper Celebration Women of Color in Technology Scholarship (2020)
- Cranfield University Master of Science in Aerospace Engineering Scholarship (2018)

Conference and Travel Scholarships
- IEEE Conference on Artificial Intelligence (IEE-CAI),Santa Clara, California, USA - All expenses (2023)
- TAPIA conference, San Diego, CA, USA - All expenses (2024)
- 55th North American Power Symposium (NAPS), Asheville, NC, US - All expenses (2023)

PUBLICATIONS AND POSTERS

Publications

C1 Uwamahoro, Nathalie, and Sara Eftekharnejad. "A Comparative Study of Data-Driven Power Grid Cascading Failure Prediction Methods." In 2023 North American Power Symposium (NAPS), pp. 1-6. IEEE, 2023.

Posters

P3 Uwamahoro Nathalie, Sara Eftekharnejad. Community Detection in Power Grids with Graph-based Methods with Cascading Failure Data (Poster). *North America Power Symposium* Asheville, NC, US. October 2023.

P2 Uwamahoro Nathalie, Sara Eftekharnejad. Predicting Power Grid Cascading Failures with Data -Driven Methods (Poster). *Syracuse University Electrical and Computer Science Research Day* Syracuse, NY, USA. March 2023.

P1 Uwamahoro Nathalie, Haben Tekie Gebrekidan, Sara Eftekharnejad, A Novel Metric for Power Grid Flexibility Considering Uncertainty from Renewable Energy Sources (Poster). *Syracuse University Electrical and Computer Science Research Day* Syracuse, NY, USA. March 2023.

LEADERSHIP AND SERVICE

Mentorship and Volunteering
- Mentor, FAWE Rwanda (2020-2021)
- Volunteer, PowerHer Rwanda (2020 - 2021)
- Volunteer, IEEE Power Conference, (2021)

References available upon request.