

## Nathalie Uwamahoro

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### RESEARCH INTERESTS

Power System, Renewable Energy, Inverter Based Resources, Machine Learning, Topological Data Analysis

### EDUCATION

#### **Syracuse University**

*Ph.D., Electrical and Computer Engineering*

Advisor: Dr. Sara Eftekharnajad

Syracuse, NY, USA

Aug, 2022 - May, 2027 (Expected)

#### **Carnegie Mellon University Africa**

*M.S., Electrical and Computer Engineering*

Kigali, Rwanda

Jul, 2018 - Dec, 2019

#### **University of Rwanda**

*B.S., Electrical Engineering Second Class Honors, Upper Division*

Kigali, Rwanda

Jul, 2013 - May, 2017

### 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)
- Ranked among the Top 5 in the Electrical Engineering program, 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)
- Data Science with Python Scholarship by Dataquest.io and AI Inclusive (2020)
- 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 (IEEE-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)
- Rwanda Science, Technology, and Innovation (STI) Conference (2022)
- Africa regional forum for Sustainable development, Kigali, Rwanda (2022)
- Launch of Centre for the Fourth Industrial Revolution Rwanda (2022)

### PUBLICATIONS AND POSTERS

#### **Publications**

- C1 Uwamahoro, Nathalie, and Sara Eftekharnajad. "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**

- P4 Uwamahoro Nathalie, Sara Eftekharnajad. Community Detection in Power Grids with Graph-based Methods with Cascading Failure Data (Poster). *North America Power Symposium* Asheville, NC, US. October 2023.
- P3 Uwamahoro Nathalie, Sara Eftekharnajad. Predicting Power Grid Cascading Failures with Data -Driven Methods (Poster). *Syracuse University Electrical and Computer Science Research Day* Syracuse, NY, USA. March 2023.

P2 Uwamahoro Nathalie, Haben Tekie Gebrekidan, Sara Eftekharnajad, 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.

P1 Uwamahoro Nathalie, McSharry Patrick, Mburu Yvonne, Busogi Moise, Coffie Isaac, Kuffuor Ernest, Kabarere Lise, Tembine Hamidou. A Relationship between Stringency Index and Covid-19 confirmed cases in East Africa (Poster). *First Rwanda Science, Technology and Innovation (STI) Conference* Kigali, Rwanda. March 2022.

## **RELEVANT EXPERIENCE**

### **National Institute of Statistics of Rwanda**

*Data Science Team Leader*

Kigali, Rwanda  
Jul, 2021 – Jul, 2022

- Led teams of Data Scientists to drive Data Revolution and Big Data initiatives.
- Implemented Python scripts for analyzing web-scraped tourism data, enhancing data-driven insights at National Level.
- Collaborated with the UK's Office for National Statistics Data Science team to share expertise and best practices.

### **Carnegie Mellon University**

*Research Assistant*

Kigali, Rwanda  
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**

*Industrial Researcher Intern*

Tokyo, Japan  
Jun, 2019 – Aug, 2019

- Reprogrammed a Maximum Power Point Tracking (MPPT) system using C, enhancing the photovoltaic micro-grid's efficiency within a 3-month period.
- Engaged in business meetings with Hitachi's industrial partners to discuss project developments and potential collaborations

### **East African Power**

*Solar Engineer and Data Analyst Intern*

Kigali, Rwanda  
Jan, 2020 – Jun, 2020

- Designed Photovoltaic on grid systems and performed financial analysis of those systems
- Researched Renewable Energy Carbon Credit for East African Power Company, enabling entry into green finance initiatives and alignment with COP26 sustainability goals
- Developed internal research recommendations for deploying data science solutions in EAP's energy projects, driving innovation and operational efficiency.

### **Energy Development Corporation Limited**

*Project Engineer Intern*

Kirehe, Rwanda  
Aug, 2020 – Oct, 2020

- Conducted quality control during construction of the medium and low voltage transmission lines
- Ensured and ensured quality control during the construction of medium and low-voltage transmission lines across 14 villages.
- Digitized over 1,000 customer records for households receiving power meters, streamlining data management and access

### **Carnegie Mellon University Africa**

*Graduate Office Assistant*

Kigali, Rwanda  
Aug, 2018 – Jan, 2019

- Facilitated interactions between CMU-Africa's visitors and staff, ensuring effective communication and support.
- Proactively engaged with 70 prospective applicants through calls, texts, and emails, successfully motivating them to complete and submit their applications before the deadline within five days.

### **Pfunda Tea Factory**

*Electrical Engineer Intern*

Rubavu, Rwanda  
May, 2017 – Sept, 2017

- Monitored and optimized electrical machine performance, contributing to increased plant efficiency and reduced downtime.
- Installed and configured two motors with a star-delta connection, enhancing the factory's operational reliability.
- Maintained and upgraded the factory's electrical lighting systems, improving energy efficiency and workplace safety.

## **TEACHING EXPERIENCE**

### **Syracuse University**

- Graduate Teaching Assistant, CIS 351 (Data Structures) – Supported 180 students in understanding data structures and Java programming, providing tutoring, grading, and technical assistance. (Fall 2024 and Spring 2025)
- Graduate Teaching Assistant, CIS 151 (Principles and practice of programming) – Guided 150 students in fundamental programming concepts, debugging techniques, and problem-solving strategies. (Fall and Spring 2023)

**Carnegie Mellon University**

- Graduate Teaching Assistant, Orientation Program (Summer 2021)
- Graduate Teaching Assistant, Mathematical Foundation for Machine Learning (Fall 2020)
- Graduate Teaching Assistant, Advanced Power System Analysis (Fall 2019)

**PROFESSIONAL SERVICE**

**Institutional Service** Secretary of Energy and Embedded Systems at Carnegie Mellon University Africa (2019) **External Reviewing**

- North America Power Symposium (NAPS) 2023

**STUDENT MENTORING****Carnegie Mellon University Africa**

- Fidele Nsanzumukunzi (Masters)
- Ngoran Clare Joyce (Masters)

**FAWE-Rwanda Chapters**

- Neema Rosette (Undergraduate)
- Nizeyimana Aimee Christine (Undergraduate)

**PRESS COVERAGE**

- NAPS Award Congratulations (SU LinkedIn, 2023)
- TAPIA Conference( SU ECS news 2024)
- Power Up: Electrical Engineering and Computer Science Graduate Student Nathalie Uwamahoro (SU ECS news, 2024)

**LEADERSHIP AND SERVICE****Mentorship and Volunteering**

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