MERCY CHELANGAT KOECH

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SUMMARY

Ph.D. Candidate in Electrical Engineering with 5+ years of experience leading strategic consulting, research, and global innovation initiatives in electrified transportation, power systems, and sustainability. Proven ability to synthesize complex technical data into actionable strategies that drive investment, improve efficiency, and enable organizational growth. Recognized for strong analytical skills, stakeholder engagement, and cross-functional leadership across global teams in the academic, industry, and nonprofit sectors. Eager to learn.

EDUCATION

- **The University of Texas at Dallas - MSc - PhD in Electrical Engineering** *2023 - 2026*
  Research Area: *Sustainability of Electrified Transportation - GPA: 3.55/4.00* Dallas, Texas
  - Understanding of principles in power conversion, switching devices, circuit functionality, and electrical safety. Electric machine principles on DC & AC machines, exposure to finite element analysis, machine topologies, motor drive fundamentals, and control mechanisms. Computer-Aided Design of Electric Machines, High Voltage Transients.
- **Moi Univeristy, Kenya - B.Eng. in Electrical Electronic Engineering** *2012 - 2017*
  Final Project: *An IoT Based Electric Smart Meter integrated cost-efficient monitoring system for energy use - GPA: 3.4/4* Eldoret, Kenya
  - Power Systems Analysis, Dynamics and Control, Switchgear and Protection, High Voltage Technology, Power Transmission and Distribution, Operations Research, Renewable Energy Technology, Energy Management, and Environmental Protection.

EXPERIENCE

- **Oak Ridge National Laboratory [🌐]** *May - August 25'*
  Graduate Research Intern Knoxville, Tennessee
  - Contributed to the design and optimization of rare-earth-free electric motor technologies for medium and heavy-duty electric vehicles, with target operating specifications of 380kW, 5000–10,000 rpm supporting DOE initiatives in sustainable transportation and critical materials reduction and resilience.
  - Conducted electromagnetic modeling, thermal analysis, and material benchmarking using ANSYS Maxwell, Fluent, and Workbench to evaluate interior permanent magnet and switched reluctance machines.
  - Authored an extensive literature review and gap analysis on the application of Artificial Intelligence and Machine Learning (AI/ML) techniques in electric machine design, optimization, and performance prediction.
  - Developed simulation workflows and design parameter trade-offs to guide OEM-focused motor design decisions, considering weight, magnet composition, and energy losses.
- **The Renewable Energy and Vehicular Technology Lab [🌐]** *2023 - Present*
  Research and Teaching Assistant Richardson, Texas
  - Supported system optimization and performance analysis research on grid-connected electric propulsion systems and LCA modeling of power electronics, aligned with energy resilience and utility-scale integration goals.
  - Conduct literature reviews on power electronics components, renewable energy, sustainability, and electrified transportation system technologies; document experimental procedures, data, and results; and prepare research reports and presentations for seminars and conferences.
  - Assisted in developing technical presentations and feasibility assessments for prototype energy systems, aligning engineering results with customer and industry objectives.
- **IEEE Smart Village [🌐]** *2019 - 2022*
  Business and Fund Development Director Hybrid
  - Consulted on solar microgrid and EV integration projects to support electrification and grid resilience, including technical, financial, and regulatory stakeholder coordination and infrastructure planning.
  - Secured over 100K in funding from IEEE Smart Village and other organizations for solar microgrid projects through proposal development and collaboration, impacting sectors like healthcare, agriculture, and tourism. Raised 10K USD for Giving Tuesday.
  - Supported customer engagement and solution development by translating technical data into accessible project value propositions for stakeholders. Developed monitoring frameworks that improved data accuracy and operational reporting by 35%, enabling evidence-based investment decisions.
- **Industrial Promotion Services IPS [🌐]** *Sept 17'– Mar 18'*
  Rural Projects Development Officer Onsite
  - Conducted techno-economic analyses of solar microgrids for the Aga Khan Fund for Economic Development infrastructure department to assess the economic viability of projects, evaluating factors such as system cost, payback period, and return on investment.

◦ Conducted energy audits and feasibility studies for renewable energy technologies, including electric vehicle charging infrastructure and showcased projects portfolio to investors and clients.

- **Ofgen East Africa Ltd** *June – August 2016*
  Technical Trainee Onsite
  ◦ Collaborated with engineering and business development teams to design and optimize commercial and residential solar PV systems through client energy audits and load assessments, delivering tailored renewable solutions that improved efficiency and cost savings.
  ◦ Engaged directly with customers and suppliers throughout project delivery—preparing technical proposals, supporting tender processes, and strengthening relationships that contributed to successful deal closure and system implementation.
- **Genergy Electricals Kenya** *June – August 2016*
  Electrical Engineer Trainee Onsite
  ◦ Worked on the construction of the East Africa Data Center AIS 66/11 kV Substation and implemented technical solutions to meet the demands of a smart grid network. Supported sales engineering efforts by contributing to technical proposals and communicating product benefits to end-users and procurement officers.
- **Kenya Power [🌐]** *May - July 2015*
  Undergraduate Engineering Intern Onsite
  ◦ Supported substation automation projects and monitored national grid operations via SCADA; assisted with incident tracking and resolution using the Open Incident Management System.
  ◦ Participated in power installations, transformer setups, and switchgear configuration for new clients (overhead and underground).
- **James Finlay Kenya** *July - Aug 2013*
  Engineering Workshop Intern Onsite
  ◦ Involved in the motor rewinding process and worked with the operations and maintenance team to oversee high-tension and low-tension power lines and repaired lightning arrestors to improve electrical safety.

Skills

- **Programming Languages:** Python, Matlab
- **Software & Simulation Tools:** MATLAB/Simulink, AutoCAD Electrical, LTSpice, PLECS, Ansys (Maxwell, Fluent, Workbench), SolidWorks, Altium Designer, Cadence Suite, MS Office Suite
- **Data Analysis & Visualization:** Data Analytics, Visualization, Statistical Analysis
- **Project Management:** Project Planning & Scheduling, Budgeting, Cost Estimation, Stakeholder Communication
- **Research & Development:** Literature Review, Market Research, Experimental Design, Testing, Analysis
- **Soft Skills:** Collaboration, Communication, Problem-Solving, Critical thinking, Outreach, Reporting

Projects

◦ Designed a step-up flyback converter for solar panels for off-grid electrification applications. Utilized MATLAB Simulink and PLECS for modeling and simulation of the converter circuit, including analysis of voltage and current waveforms, efficiency calculations, and component sizing.

Leadership & Volunteer Experience

◦ Students and Young Professionals Chair, IEEE Dallas Section, IEEE PES/IAS/PELS Joint Chapter Secretary, organizing STEM events to promote engagement in the professional and academic engineering community.
◦ Institute of Electrical and Electronic Engineers, IEEE, 2017–Present—Leveraged IEEE involvement to deepen technical expertise in renewable energy, energy storage, and EV technologies, applying knowledge to develop innovative solutions for addressing climate change and advancing electrified transportation.
◦ PES Climate Change and Sustainability Member at Large Governing Board Member (2023): Led IEEE Power Energy Society committee initiatives focused on sustainable energy and climate action.
◦ Global Chair 2022, Vice Chair 2021, of IEEE Power Energy Society (PES) Day: Led a team of 700 volunteers from 52 countries for IEEE PES Day initiatives.
◦ IEEE Smart Village Marketing Committee Chair 2020-2022: Created and improved project visibility by 300 percent. Managed comprehensive databases for 35 projects report monitoring, impact tracking, and fundraising efforts.

Honors and Awards

◦ IEEE Educational Activities Board Life Member Graduate Study Fellowship Award 2024—2026 to recognize exceptional achievements in the engineering community.
◦ IEEE Women in Engineering honorable mention as Inspiring Member of the Year Award 2021 for empowering communities through electrification to achieve socioeconomic sustainability.
◦ IEEE Women in Engineering Clementina Saduwa Award 2019—for noteworthy support for women in the engineering profession.