Kabato Burka

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Education

Northeastern University — *Boston, MA*

Masters of Science in Electrical and Computer Engineering with Concentration in Power System — *May 2026*

GPA: 3.83
Selected coursework: Electric Drives, Electric Vehicles Powertrains, Electromagnetic Devices, Power Electronics, Power Systems Analysis

Northeastern University — *Boston, MA*

Bachelor of Science in Electrical Engineering — *December 2024*

GPA: 3.55
Honors: Dean's List, Global Scholar
Study Abroad: Thessaloniki, Greece
Selected coursework: Electronic Design, Integrated Circuit Devices, Research

Publication

Heat Energy Harnessing via Seebeck Generators

American Society For Engineering Education Conference

- Katikaneni, R. R., & Farah, M., & Martinez, C. M., & **Burka, K**., & ANIAGBOSO, T. C., & Maheswaran, B. (2022, April), *Heat Energy Harnessing via Seebeck Generators* Paper presented at ASEE-NE 2022, Wentworth Institute of Technology, Massachusetts. 10.18260/1-2–42179

Research and Work Experience

Energy Efficient Circuits and Systems Group — *Boston, MA*

Research Assistant — *August 2025 - Present*

- Principal Investigator: Aatmesh Shrivastava
- Design and simulate DC/DC converter topologies and compensation networks for a high-efficiency 48 V to 1.8 V point-of-load power stage
- Develop Altium PCB layouts of converter circuits, integrating specified inductors and resonant components into the design
- Characterize and test custom inductors and circuit parameters to validate performance against power density and efficiency targets

Programmable and Reconfigurable Soft Engineered Systems (PARSES) Laboratory — *Boston, MA*

Research Assistant — *July 2025 - Present*

- Principal Investigator: Kris Dorsey
- Engineer a robotic splint prototype with a programmable hinge joint, emphasizing long-arm actuation for soft wearable rehabilitation systems
- Assist with power delivery by configuring DC/DC converter and applying compensation networks for system stability
- Evaluate hinge motion and sensor responsiveness through iterative experimentation, refining control strategies and mechanical adaptability

Renesas Electronics Corporation — *Boston, MA*

Field Application Engineer — *January 2025 - Present*

- Support design-in and integration of Renesas Power and Analog products across customer projects in the Americas East region by providing consultations, application guidance, and on-site engineering support
- Deliver schematic reviews and system-level design guidance to accelerate product adoption and design wins
- Collaborate with sales and product engineering teams to resolve technical challenges and align solutions

Fleet Robotics — *Somerville, MA*

Robotics Test Engineer Intern — *September 2024 - December 2024*

- Researched magnetic system behavior, focusing on field interactions and their adhesion to ship hulls
- Conducted experimental testing and data analysis to evaluate sensor reliability and magnetic interference in real-world environments
- Informed design improvements based on magnetic field characterization and system response

Amazon — *Boston, MA*

Hardware Development Engineer Intern — *June 2024 - September 2024*

- Directed Failure Modes and Effects Analysis for the 20lb Universal Item Sorter system across NA and EU/UK, establishing and monitoring KPIs to drive asset cost reduction for Amazon Reliability Maintenance Engineering
- Examined the use case and development of systems along with their sub-components at traveled sites in NA
- Consulted with key stakeholders to align project objectives and drive successful outcomes of asset reliability

Kostas Research Institute — *Burlington, MA*

RF Research Engineer Intern — *January 2024 - June 2024*

- Validated antenna project designs for the Assured Communications and Electromagnetic Dominance Division
- Co-developed and executed tests for electromagnetic designs alongside research engineers
- Prepared lab equipment, including function generators, oscilloscopes, and vector network analyzers, for testing

Advanced Materials and Microsystems Laboratory — *Boston, MA*

Research Assistant — *January 2024 - April 2024*

- Principal Investigator: Nian Xiang Sun (Presently on Leave of Absence for Industry)
- Researched and prototyped a resistive circuit for breath-based SARS-CoV-2 detection using glucose aerosol sensors
- Tested a low-power design to capture and differentiate respiratory resistivity signatures
- Validated sensor performance and explored applications in non-invasive diagnostics

SharkNinja — *Needham, MA*

Electrical Design Engineer Intern — *July 2023 - December 2023*

- Collaborated with senior members in designing analog circuits and development of novel concepts for next-generation cordless vacuum
- Performed design, debugging, and board bring-up of analog real-time embedded electronics
- Led PCBA reworks of field products and analyzed consumer-reported issues with EE, PD, FW, and SW teams

Technical Projects

Solar Panel Electrode Cleaning Drone — *Boston, MA*

EECE 4790/EECE 4791: Electrical and Computer Engineering Capstone 1 and 2 — *June 2024 - December 2024*

- Principal Investigator: Masoud Salehi
- Integrated a high-voltage DC system delivering up to 10 kV to create an electrostatic field for panel dust removal
- Led testing of subsystem components and supported end-to-end integration using ESP32 microcontrollers and custom sensor inputs
- Demonstrated the working system at Northeastern University's Capstone Showcase, earning 2nd place among 20+ engineering teams

Wilkinson Power Divider — *Boston, MA*

EECE 5693: Electromagnetic Devices for RF and Wireless Communications — *May 2024 - June 2024*

- Designed and fabricated a 2.45 GHz RF power divider using Ansys HFSS and LPKF ProtoMat PCB Milling System
- Assembled the PCB on RO4003C substrate and tested performance with SMA connectors and surface-mount resistors
- Measured return loss, insertion loss, and port isolation using a vector network analyzer to validate performance against design targets

Multi-static Sensing and Affecting in Distributed RF and Radar — *Burlington, MA*

Kostas Research Institute Assured Communications and Electromagnetic Dominance Laboratory — *March 2024 - June 2024*

- Principal Investigator: James Vedral
- Investigated interference-resilient radar sensing using distributed RF arrays for scene change detection in GPS-denied environments
- Contributed to development focused on interference mitigation, adaptability, and low-observability sensing

PCB-Based Breath Resistivity Sensor for SARS-CoV-2 Detection — *Boston, MA*

Nian Xiang Sun Group: Advanced Materials and Microsystems Laboratory — *January 2024 - April 2024*

- Principal Investigator: Nian Xiang Sun (Presently on Leave of Absence for Industry)
- Designed a circuit to detect glucose aerosols in breath by measuring resistive changes linked to COVID-19 biomarkers
- Integrated a resistive sensing element with analog front-end circuitry for real-time signal conditioning and data capture
- Analyzed breath samples in a controlled setup to assess sensor accuracy and reliability for non-invasive viral screening applications

Electrocardiogram Heart Monitor — *Boston, MA*

EECE2150: Circuits and Signals — *November 2022 - December 2022*

- Built a three-stage amplifier system to extract ECG signals and display heart rate with analog filtering
- Applied signal processing fundamentals to refine and analyze biosignal data
- Implemented MATALB signal porcessing to determine the rate of a beating heart in connection with the ECG circuit

Self-Tutor Translator — *Boston, MA*

EECE2140: Computing Fundamentals — *November 2022 - December 2022*

- Programmed a speech-based Python program for real-time voice-to-text translation
- Implemented voice input, translation API, and iterative prompts to improve user interaction
- Provided 92% speech accuracy detection

Heat Energy Harnessing via Seebeck Generators — *Boston, MA*

GE 1501/1503: Cornerstone of Engineering 1 and 2 — *September 2022 - December 2022*

- Prototyped thermoelectric generators using Peltier modules to convert waste heat into electricity
- Investigated temperature-to-voltage characteristics and optimized module placement to maximize power output from a 100°C gradient
- Presented research findings at the ASEE Northeast Conference following recognition for innovation in sustainability

Teaching

EECE 2150: Circuits and Signals: Biomedical Applications

Boston, MA

Teaching Assistant

September 2025 - Present

- Course instructor: Prof. Nicol Mcgruer
- Planning and running lab section for understanding of application of passive components and introduction of active components such as Operational Amplifiers, Instrumentation Amplifiers, and Light Emitting Diodes
- Grading assignments of weekly homework and quizzes for over 50 students
- Support students with hosted weekly office hours to discuss elements of class that students would like to discuss

EECE 5693: Electromagnetic Devices for RF and Wireless Communications

Boston, MA

Teaching Assistant

June 2025 - July 2025

- Course instructor: Prof. Hossein Mosallaei
- Held guided sessions on Ansys HFSS, teaching students how to simulate and design transmission lines and antenna configurations
- Supported students in understanding wave propagation, S-parameters, and impedance matching through lab assistance
- Assisted during lab sessions by answering technical questions, troubleshooting simulation issues, and reinforcing course material through hands-on guidance

University Leadership

Northeastern University Housing and Residential Life

Boston, MA

Resident Assistant

August 2022 - Present

- Plan, budget, and execute monthly events for 150+ undergraduates, fostering a sense of community
- Complete bi-annual leadership training on maintaining student safety and well-being as well as conflict control
- Serve as a peer resource by addressing resident concerns, sharing campus support services, and promoting inclusive living environments

Black Engineering Student Society

Boston, MA

Alumni Relations Chair

June 2024 - April 2025

- Advisor: Richard Harris
- Organized alumni panels, events, and mentorship programs to connect students with Black engineering professionals
- Built alumni membership structure with engagement tiers and decade representatives for the organization's 50th Anniversary
- Engaged alumni and local professionals to support student development through career talks, networking, and community-driven initiatives

Skills

Technical Skills: Hardware

- **Labratory Tools:** Multimeter, Oscilloscope, Signal Generator, Soldering Iron (Through-hole and Surface Mount), Vector Network Analyzer, Spectrum Analyzer, Bench Power Supply, LCR meter, Logic Analyzer, Reflow Oven
- **Desgin Tools:** Altium Designer, Ansys HFSS, Fusion 360 Keysight Genesys, KiCAD, LTspice, OrCAD
- **Components:** Digital logic, transistors, op-amps, and passive components.

Technical Skills: Software

- **Programming:** Python (including scientific packages), Mathmatica, MATLAB
- **Software Tools:** Adobe Suite, Asana, Git, Jira, Google Workspace, LaTeX, Microsoft 365 Suite, Slack, Visual Studio Code

Professional Affiliations

Institute of Electrical and Electronics Engineers

Member since 2024

Institute of Electrical and Electronics Engineers Power Electronics Society

Member since 2024

National Society of Black Engineers

Member since 2023