

# Kabato Burka

FIELD APPLICATION ENGINEER · RENESAS ELECTRONICS CORPORATION

he/they · Boston, MA 02120, USA

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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

Selected coursework: Electronic Design, Integrated Circuit Devices, Research

## Publications

### 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

### 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
- Developed KiCAD schematics and layouts for advanced electromagnetic research projects
- Prepared lab equipment, including function generators, oscilloscopes, and vector network analyzers, for testing

### Nian Xiang Sun Group: Advanced Materials and Microsystems Laboratory

Boston, MA

RESEARCH MEMBER

July 2024 - April 2024

- Researched and prototyped a resistive circuit for breath-based SARS-CoV-2 detection using glucose aerosol sensors
- Tested a low-power designs to capture and differentiate respiratory resistivity signatures
- Validated sensor performance and explore 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

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### Solar Panel Electrode Cleaning Drone

Boston, MA

EECE 4790/EECE 4791: ELECTRICAL AND COMPUTER ENGINEERING CAPSTONE 1 AND 2

June 2024 - December 2024

- 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: Edwin Marengo
- 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
- 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

### 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

### 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

## University Leadership

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### 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

### 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

### 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

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### TECHNICAL SKILLS: HARDWARE

- **Laboratory 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
- **Design 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), Mathematica, MATLAB
- **Software Tools:** Adobe Suite, Asana, Git, Jira, Google Workspace, LaTeX, Microsoft 365 Suite, Slack, Visual Studio Code

## Professional Affiliations

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### 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