

Chinaza Ogbonna

Contact

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Education

Ph.D., Mechanical Engineering, 2025

Georgia Institute of Technology, Atlanta, GA

M.Sc., Mechanical Engineering, 2018

Georgia Institute of Technology, Atlanta, GA
3.60 GPA

B.Sc., Mechanical Engineering, 2016

Georgia Institute of Technology, Atlanta, GA
3.32 GPA

Key Skills

Cleanroom Tools

Advanced Diagnostics
Ellipsometers
Profilometers
Microscopes
Nanospec Reflectometer
Scanning Electron Microscopy
Transmission Electron Microscopy
Electron Dispersive X-ray Spectrometer
Thermal Gravimetric

Objective

Mechanical Engineering Ph.D. Student from Georgia Tech with a focus in Micro and Nano-engineering. Substantial research and development background. Proven ability to design, build, and test mechanical systems that align with device specifications. Proven ability to plan and execute laboratory research as well as independently apply advanced knowledge of scientific research or engineering principles and practices in broad areas of assignments and related fields. Experience with training researchers on various lithographic processes to develop microdevices.

Research Experience

May 2021 – Present

Graduate Research Assistant in iSensys Research Group • Electrical Engineering Department

- Design, development, fabrication, and analysis of implantable biosensors for physiological and health monitoring

May 2017 – December 2017

Research Assistant in Kumar Research Group • Materials Science Department

- Analyzed mechanical effects of chemical treatment on carbon precursor fibers using JMP, Excel, and MATLAB
- Conducted over 1000 tensile tests on various fibers to determine the diameter, strain to failure, tensile strength, and tensile modulus using tensile testing machine
- Chemically treated the fibers under different conditions in the lab

August 2014 – December 2014

Research Assistant in Capolungo Research Group • Mechanical Engineering Department

- Studied the effects of compressive strain on magnesium alloy materials
- Streamlined the research process by writing a MATLAB code to calculate the results more efficiently
- Operated the compression testing machine

January 2014 – May 2014

Research Assistant in The Graham Lab • Mechanical Engineering Department

- Studied the impact of structural ordering on the strain to failure of polythiophene based conjugated polymers
- Presented at the President's Undergraduate Research Award symposium and the Air Products symposium

Work Experience

December 2019 – May 2021

Research Engr I • Institute for Electronics and Nanotechnology at Georgia Tech

- Served as a pioneering member of the IEN Improvements Team - developed and implemented several mechanical, design, administrative, and processing solutions to improve the quality of the experience of the users at IEN

Analysis
UV-Visible Spectroscopy
Confocal Microscopy

Deposition
Annealing Furnace
Chemical Vapor
Deposition
Atomic Layer Deposition
Sputtering
Filament Evaporation

Etching
Reactive Ion Etching

Lithography
Electron-beam lithography
Maskless Photolithography
Photolithography
Nanoscribe 3D
Lithography
Soft Lithography

Packaging
Dicing Saw

Micromachining
Femtosecond IR Laser
UV Laser

Machine Shop Tools

Milling Machines, Lathes,
Drill Presses, Band Saws,
Grinders, Compression
Testing machines, 3D
printing, and familiar with a
wide range of
manufacturing processes.

Software

MATLAB, AutoCAD,
Solidworks, Excel, Python,
JMP, MathCAD

- Served as a pioneering member on the Incident Report Team – modified the process for reporting incidents; developed and dispensed incident reports in a timely manner
- Created COVID-19 continuity and safety protocols surrounding the IEN facility use, cleanroom use, lab use, and staff responsibilities
- Developed and implemented remote training protocols for the staff to adopt for the individual tools to adapt to the pandemic
- Successfully completed 10+ processing projects relating to photolithography, soft lithography, laser micro-machining, and 3D Lithography
- Goes above and beyond the call of duty to assist research users with their micro/nano-fabrication process.
- Developed training documents, standard operating procedures, maintenance schedules, and tool logs in addition to training and external projects for the machines which include the Heidelberg MLA 150 Direct Write Photolithography System, Nanoscribe Two-Photon Lithography System, Elionix Electron-Beam Lithography System, and the Atomic Layer Deposition Systems
- Audited two courses in the Spring 2020 semester, Microelectronics Fabrication and Microelectromechanical Systems, and obtained a certification in Solidworks Simulation using LinkedIn Learning

March 2019 – November 2019

Process Equipment Engr I • Institute of Electronics and Nanotechnology at Georgia Tech

- Researched, designed, and developed/modified tools, machines, controls, equipment, and mechanical processes related to microelectronics and nanotechnology, ensuring customer criteria are met
- Oversaw installation, operation, maintenance, repair, and development of 10+ new, modified, and/or existing cleanroom machines
- Oversaw 5+ engineers to ensure that those tools are operating effectively upon project completion
- Prepared 30+ CAD drawings for mask design, new equipment design, current equipment modifications, and lab layouts using AutoCAD, Beamer, and Solidworks
- Design and development of 30+ microdevices and masks using various forms of lithography including but not limited to maskless photolithography, electron-beam lithography, and nanoscribe lithography
- Micromachining of various materials (metals, glass, polymers) using various types of lasers including the femtosecond laser
- Train 10+ users on the Galvo-, rotational cutting, Infinite Field of View, and Head cutting modes using the Femtosecond laser
- Trained 30+ researchers on various machines relating to lithography, micromachining, and etching
- Created 5+ project reports for project planning, management, and completion
- Assessed the scope of 5+ research projects and ensured projects are on time and within budget
- Designed and implemented monthly alignment and dose tests on the MLA Heidelberg and Elionix EBL
- Designed patterns with various types of positive and negative resists using the Heidelberg and Elionix EBL Tool including SC 1813, SC 1827, SPR 220, PMMA A6, NR 7-3000, NR 9-1500 and so on
- Carried out experiments on glass, silicon wafers, amongst other substrates using the Elionix EBL tool
- Created structures with features as small as 100 microns and large as 2mm with the Nanoscribe 3D Lithography tool
- Hands-on experience with characterization and diagnostics of materials using ellipsometers, profilometers, electron microscopes, and confocal microscopes

January 2018 – December 2018

Graduate Research Assistant • Institute of Electronics and Nanotechnology at Georgia Tech

- Designed and implemented mechanical modifications to over eight cleanroom tools using Solidworks, AutoCAD, and machine shop tools.
- Designed and developed photomasks for various microdevices including a microheater, microneedles, and microfluidic devices using AutoCAD and Beamer.
- Trained over 50 researchers on the nanoscribe lithography tool, electron-beam lithography tool, and the Heidelberg maskless photolithography tool.
- Optimized the electron-beam lithography process and photolithography process by developing spin speed curves for positive and negative resists with conducting and non-conducting substrates under varying development conditions.
- Trained on over 40 cleanroom tools relating to metallization, etching, lithography, and characterization of micro- and nano-devices.

May 2017 – August 2017

Graduate Mechanical Engineering Intern • Consolidated Engineering Company

- Used MATLAB, MathCAD, and Microsoft Excel to write an algorithm that calculated properties of roller hearth furnaces and ovens such as air velocity, convection, and radiation heat transfer coefficients, and the heat-up time of the castings, based on geometric and material inputs from the clients
- Designed and ran experiments to verify the calculations

Leadership

The Steministas Brand (www.thesteministas.com) • Founder and Main Host

June 2018 – Present

- Designed, built, and maintain the website using Wix
- Design all social media graphics using GIMP, Adobe Photoshop, and Canva
- Edit all the podcast episodes using Audacity
- Directed, produced and edited all seasons, available on Apple Podcasts, Spotify, SoundCloud, and several other platforms
- Host small events for women in Atlanta themed around personal development topics

oSTEM (<https://www.ostem.org/>) • Social Coordinator, Womxn Affinity Group

August 2020 – Present

- Cultivate environment of belonging with the Womxn Affinity group and facilitate meetings for that group.
- Serves as the primary point of contact for the affinity group members.
- Host at least one live video conference call meeting with the Womxn Affinity group each month.
- Well-versed in the principles of safe spaces, able to respect diverse human identities and experiences, and comfortable guiding constructive conversations.

Caterpillar's Promise • Volunteer, STEAM Fair

January 2021 – May 2021

- Planned and executing STEAM Fair for Black and Latinx K-12 students in the inner-city Atlanta area to encourage interest in STEAM fields.

Georgia Tech Society of Black Engineers Programs Committee • Member

September 2018 – May 2019

- Planned and executed the largest Black Women in Science, Technology, Engineering, Arts, and Mathematics (STEAM) event with over 150 attendees

Georgia Tech Society of Black Engineers Pre-Collegiate Initiative Committee • Member

September 2017 – May 2018

- Planned and executed a PCI – day event with three local high schools to foster interest in STEM and Georgia Tech in underrepresented minority groups.

Spoken Languages

English – Native, German
– Conversational

Communication

Writing Technical presentations, Technical reports, Project proposals