

# NOSAKHARE “NOSA” EDOIMIOYA

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## EDUCATION

- 2017-Present Ph.D. University of Michigan, Ann Arbor, MI**  
Mechanical Engineering; Focus on Mechatronics and Control
- 2017-2019 M.S. University of Michigan, Ann Arbor, MI**  
Mechanical Engineering; Mechatronics
- 2013-2017 B.S. Stanford University, Stanford, CA**  
Mechanical Engineering

## HONORS AND AWARDS

### **University of Michigan, 2017-Present**

- 2019 Archer-Cornfield Teaching Fellowship (Ashesi University – Ghana)  
2019 Michigan Space Grant Consortium Awardee  
2019 Martin Luther King, Jr. Spirit Award  
2018 National Science Foundation Graduate Research Fellowship  
2018 Ford Foundation Pre-Doctoral Fellowship Honorable Mention  
2017 Rackham Merit Fellowship

### **Stanford University, 2013-2017**

- 2017 Mechanical Engineering Thermo-Sciences Capstone Course Competition Winner  
2017 Volunteer Student Organization of the Year (Society of Black Scientists and Engineers)  
2014 American Physical Society Minority Scholarship  
2013 Dean’s Award for Exceptional Academic Excellence (2013-2017)

## PUBLICATIONS

1. [Edoimioya, N.](#), Okwudire, C.E., “A Generalized and Efficient Control-oriented Modeling Approach for Vibration-prone Delta 3D printers using Receptance Coupling,” Under Review.
2. Gong, Y., [Edoimioya, N.](#), “Reconstructing Arbitrary-Duration Ultrashort Pulses from FROG Traces using Deep Convolutional Neural Network Algorithm,” *Frontiers in Optics and Laser Science*, Oct. 31-Nov. 4, 2021. Accepted abstract and oral presentation.
3. [Edoimioya, N.](#), Okwudire, C.E., “An Efficient Control-oriented Modeling Approach for Vibration-prone Delta 3D printers using Receptance Coupling,” *17<sup>th</sup> International Conference on Automation Science and Engineering (CASE)*, August 2021. Accepted paper and oral presentation.
4. [Edoimioya, N.](#), Ramani, K.S., Okwudire, C.E., "Software Compensation of Undesirable Racking Motion of H-frame 3D Printers using Filtered B-Splines," *Additive Manufacturing*, vol. 45, Nov. 2021, <https://doi.org/10.1016/j.addma.2021.102290>
5. Ramani, K.S., [Edoimioya, N.](#), Okwudire, C.E., “A Robust Filtered Basis Functions Approach for Feedforward Tracking Control – with Application to a Vibration-Prone 3D Printer,” *IEEE Transactions on Mechatronics*, vol. 25, no. 5, pp. 2556-2564, Oct. 2020, [doi: 10.1109/TMECH.2020.2983680](https://doi.org/10.1109/TMECH.2020.2983680) (**Best Paper Award Finalist**)

6. Edoimioya, N., Ramani, K.S., Okwudire, C.E., "Software Compensation of Undesirable Racking Motion of H-frame 3D Printers using Filtered B-Splines", *2020 International Symposium on Flexible Automation (ISFA 2020)*, July 8-9, 2020, Virtual Conference.
7. Edoimioya, N., Ramani, K.S., Okwudire, C.E., "Simultaneous Vibration Error Compensation and Feedrate Optimization using Filtered B-splines," *8th International Conference on Virtual Machining Process Technology (VMPT 2019)*, April 23-25, 2019, Vancouver, British Columbia, Canada.

## **SELECTED PRESENTATIONS**

*Data-Driven Control for High-Throughput Additive Manufacturing*. Mechanical and Aerospace Engineering Future Leaders Seminar Series. October 2020. Virtual Oral Presentation. Website: <https://sites.google.com/view/MAEFutureLeaders>

*Software Compensation of Undesirable Racking Motion of H-frame 3D Printers using Filtered B-Splines*. 9<sup>th</sup> International Conference on Virtual Machining Process Technology (VMPT 2020), Virtual Conference. July 2020. Oral Presentation.

*Simultaneous Vibration Error Compensation and Feedrate Optimization using Filtered B-splines*. 8<sup>th</sup> International Conference on Virtual Machining Process Technology (VMPT 2019), Vancouver, British Columbia, Canada. April 2019. Oral Presentation.

*Vibration Compensation of a Desktop 3D Printer using Software Compensation*. Summer Research Opportunity Program – Final Symposium. Ann Arbor, MI. July 2016. Poster Presentation.

*Scaling Considerations for Improving Perching and Climbing of the Stanford Climbing and Aerial Maneuvering Platform (SCAMP)*. Stanford Undergraduate Research Institute – Final Symposium. Stanford, CA. August 2017. Poster Presentation.

## **RESEARCH EXPERIENCE**

2017-Present	Graduate Research Assistant, Smart and Sustainable Automation (S2A) Lab University of Michigan, Ann Arbor, MI
2018	Visiting Researcher, MIT Mechanosynthesis Group Massachusetts Institute of Technology, Cambridge, MA
2017	Undergraduate Research in Mechanical Engineering, Biomimetic and Dexterous Manipulation Lab, Stanford, CA
2016	Summer Research Opportunity Program (SROP), S2A Lab University of Michigan, Ann Arbor, MI
2014-2015	Research Intern, Stanford Linear Accelerator Center (SLAC) National Laboratory Menlo Park, CA

## **TEACHING EXPERIENCE**

2020	Lecturer, ENGR 442: Introduction to Mechatronic Design Ashesi University, Accra, Ghana
2020	Lecturer, ME 441: Manufacturing Processes Ashesi University, Accra, Ghana
2019	Graduate Student Instructor, ME 360: Modeling, Analysis and Control of Dynamic

Systems, University of Michigan, Ann Arbor, MI

## **MENTORING**

### **University of Michigan**

2018- **STEMulation**, Ann Arbor, MI.

2019 Planned and executed a day-long engineering education event for high school students in the greater Detroit area under the Society of Minority Engineers and Scientists (Graduate Component) at the University of Michigan.

2018 Malik Schkoor and Eric Bell II, Summer undergraduate research students. Developed a model for a 3D printer with an unconventional gantry system and applied vibration compensation algorithm.

2018 Malik Franklin and Perry Francois-Edwards, Undergraduate students. Diagnosed and resolved hardware and software issues relating to printing performance of a Delta 3D printer.

2018 **BMECHx, Department of Mechanical Engineering**, Ann Arbor, MI.

Organized gatherings between undergraduate and graduate students in Mechanical Engineering to discuss ways the department can improve the curriculum, instruction and resources for students.

### **Stanford University**

2013- **The Phoenix Scholars**, Stanford, CA.

2017 Assisted high school seniors with college applications, essay editing, and applying for financial aid. All three students mentored attending 4-year universities with financial aid (one student currently attending Stanford University).

2015- **SBSE Bytes**, Stanford, CA.

2017 Co-founded the wing of Stanford's Society of Black Scientists and Engineers (SBSE) known as Bytes (Black Youth Teams Engineering Success). Served as a project leader and a workshop instructor.

## **PROFESSIONAL SERVICE**

**College of Engineering Graduate Student Advisory Council**, University of Michigan, 2018-2019

*Society of Minority Engineers and Scientists and Department of Mechanical Engineering*

*Representative* – convene bi-monthly to identify and plan activities for graduate students, as well as to address areas of concern.

**Office of Diversity and Inclusion Student Advisory Board**, University of Michigan, 2018-2021

*Member* – convene twice a semester to discuss the experiences of students at U-M and propose strategies to foster diversity and cohesion in the campus community.

**The Phoenix Scholars**, Stanford, CA, 2015-2017.

*Executive Director* – developed a strategic vision for the nonprofit organization and managed a team of 20 student volunteers. Oversaw the execution of projects, development of a Board of Directors, fundraising campaigns, and grant proposals

## **PROFESSIONAL AFFILIATIONS**

National Society of Black Engineers (NSBE)

Association of Nigerian Engineers and Scientists in the Americas (ANESA)

## **PRESS AND OUTREACH PRESENTATIONS**

- 2019 **University of Michigan: From 3D printing to 3D Sprinting** ([link video](#))  
Video on research into control algorithms that improve 3D printer speed using dSPACE controllers.
- 2019 **Money Moves: Setting Yourself Up for Success in Personal Finance.**  
*Interactive presentation and workshop.* 2019 National Society of Black Engineers Annual Convention. March 2019. Detroit, MI.
- 2018 **Half Day of Science and Engineering.**  
*Interactive presentation and workshop.* Fortis Academy (Middle School). May 2018. Ann Arbor, MI.
- 2018 **The Role and Function of Water in Our World.**  
*Interactive presentation and workshop.* Children Defense Fund Freedom School (K-5). July 2018. Bethel United Methodist Church, Flint, MI.

## **RESEARCH FUNDING**

- 2019 **Michigan Space Grant Consortium**  
Awarded funding for a research proposal to investigate a control technique to improve the performance and life-cycle of 3D printers in space. Funding amount: \$5,000.
- 2018 **Rackham Graduate Student Research Grant**  
Awarded the Rackham Pre-Candidate Research Grant for a research proposal to purchase research materials for work prior to candidacy exams. Funding amount: \$1,500.

## **PROFESSIONAL DEVELOPMENT**

Georgia Tech FOCUS Fellows Program (Jan. 2019)  
Demystifying Deep Learning: A Practical Approach in MATLAB, University of Michigan and MathWorks (June 2018)  
NextProf Workshop, University of Michigan (May 2018)

## **LANGUAGES**

Spanish (intermediate)