

# OMOBOLADE ODEDYOYIN

(443) 535-2964 • [oodeyoy2@jhu.edu](mailto:oodeyoy2@jhu.edu) • [linkedin:omoboladeodedoyin](https://www.linkedin.com/in/omoboladeodedoyin)

## EDUCATION

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### Johns Hopkins University

*Doctor of Philosophy* | Computer Science

Advisor(s): Joshua Vogelstein, Jessica Sorrell

Baltimore, MD

Expected 2030

*Master of Science in Engineering* | Data Science

August 2023 – May 2025

Advisor(s): Benjamin Grimmer

*Bachelor of Science* | Applied Mathematics and Statistics

August 2019 – May 2023

Advisor(s): Mario Micheli

### Relevant Coursework

Mathematical Statistics (Theory), Probability (Theory), Data Science, Bayesian Statistics, Applied Statistics & Data Analysis, Machine Learning, Artificial Intelligence, Algorithms, Data Structures (Java), Mathematical Modeling & Consulting (SP24 TA), Optimization, Computing for Applied Mathematics, Computer Systems Fundamentals (Assembly, C/C++), Intermediate Programming (C/C++), Applied Plotting & Data Representation, Gateway Computing (Java & MATLAB), Differential Equations, Linear Algebra, Calculus I–III, Discrete Mathematics

## HONORS AND GRANTS

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- National Consortium for Graduate Degrees for Minorities in Engineering and Science (**GEM**) **Employer Ph.D. Fellowship (fully funded)** (Aug 2025)
- **Top 3 for Best Poster: 2025 Johns Hopkins Research Symposium on Engineering in Healthcare** (January 2025)
- GEM i4 Travel Grant Award: AfroTech Conference (Nov 2024)
- Johns Hopkins University Center for Diversity and Inclusion Black Heritage Celebration Scholarship (Mar 2024)
- **1st Place for Best Poster under the Nuclear Research & Experiments Division: 2023 INL Poster Session** (Aug 2023)
- Johns Hopkins University Dean's Master's Fellowship (Aug 2023 – present)
- Johns Hopkins University Rubenstein Fellowship (Aug 2023 – present)
- **GEM Employer Master's Fellowship (fully funded)** (Aug 2023 – present)
- NSF Travel Grant Award: Emerging Data Science Methods for Complex Biomedical and Cyber Data Workshop (Mar 2023)
- Johns Hopkins University Acheson J. Duncan Fund for the Advancement of Research in Statistics Award (Mar 2023, April 2024, Sept 2024, Nov 2024, Jan 2025)
- **Johns Hopkins University Elijah Cummings Baltimore Scholarship (fully funded)** (Aug 2019 – May 2023)
- NAACP Legal Defense Fund Herbert Lehman Scholarship (Aug 2019 – May 2023)
- NSF Travel Grant Award: Statistics Undergraduate Research Experience for the Southern Regional Council on Statistics Research Conference (Oct 2022)
- NSF Travel Grant Award: GEM Conference (Sep 2023)
- Johns Hopkins University Hackerman Polytechnic Scholarship (Aug 2022 – May 2023)
- Johns Hopkins University Morris Goldseker Scholarship (Aug 2021 – May 2022)
- Dr. Walter Scott Thomas Sr Scholarship (Aug 2020 – May 2021)
- Maryland Science Center Dr. H. Bentley Glass Scholarship (Aug 2019 – May 2020)

## JOURNAL PAPERS

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[Under Review] Yoshiura, R. K., Cao, G., Moudgal, A., McDowell, D. J., Kajihara, T., **Odedoyin, O. A.** Machine Learning–Driven Molten-Salt Behavior Exploration and Regression Part I: Feature Selection Analysis. *ANS Nuclear Science and Engineering*.

Villavisanis DF., Schröde KM., Javaid HA., Muniak M., **Odedoyin O.**, Gellatly VA., Xu-Friedman M., Lauer AM. Olivocochlear System Plasticity in Response to Chronic Noise. *Journal of the Acoustical Society of America*. November 2018.

## CONFERENCE PAPERS

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**Odedoyin O. A.**, Yoshiura R. K., Cao G., Karlsson T. Y., Kajihara T., McDowell D. J., Moudgal A. Development of a Machine Learning-Based Predictive Modeling Framework for Molten Salt Reactor Sensor Data Analysis. *In Proceedings of the 2025 American Nuclear Society Conference*. ANS. April 2025.

**Odedoyin O.**, Cárdenas E., Ocampo Giraldo L., Greenhalgh M., Hix J. *In Proceedings of the 2024 American Nuclear Society Winter Conference & Expo: Radiation Protection and Shielding Division*. ANS. November 2024.

Karthic M., Killanin D., **Odedoyin O.** The Promising Future of Fintech in Closing the Racial Wealth Gap. *In Proceedings of the 2022 Association for Financial Counseling and Planning Education Symposium*. AFCPE. November 2022.

Villavisanis, D. F., Schröde, K. M., **Odedoyin, O.**, Javaid, H., Xu-Friedman, M., & Lauer, A. M. (2018). Effects of noise on olivocochlear feedback to the cochlea. *In Proceedings of the 41st Annual MidWinter Meeting of the Association for Research in Otolaryngology (ARO Abstracts)*, 41(1):453–454. February 2018.

## PRESENTATIONS

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**Odedoyin O.**, Yoshiura R.K., Cao G., Karlsson T.Y., Kajihara T., McDowell D.J., Moudgal A. "Predictive Modeling of Sensor Molten Salt Reactor Data for Enhanced Monitoring and Analysis,"

- Oral Presenter, American Nuclear Society Conference, Chicago, IL, June 2025
- Poster Presenter, American Nuclear Society Student Conference, Albuquerque NM, April 2025
  - **Acheson J. Duncan Fund for the Advancement of Research in Statistics Award**
- Poster Presenter, CalTech Conference for Emerging Black Academics in STEM (CEBAS), Pasadena, CA, April 2025
  - **Acheson J. Duncan Fund for the Advancement of Research in Statistics Award**
- Oral & Poster Presenter, Mid-Atlantic Research Exchange (MATRIX), Baltimore, MD, March 2025
- Poster Presenter, Department of Medicine and Whiting School of Engineering Research Retreat and Poster Session, Baltimore MD, February 2025
- Poster Presenter, 8th Annual Johns Hopkins Research Symposium on Engineering in Healthcare, Baltimore MD, January 2025
  - **Awarded 3rd Place for Best Poster**
- Oral Presenter, 2025 Annual Joint Mathematical Meeting (JMM), Seattle, WA, January 2025
  - **Acheson J. Duncan Fund for the Advancement of Research in Statistics Award**
- Poster Presenter, Data Science Capstone Experience Poster Presentation, Baltimore MD, December 2024

- Poster Presenter, Johns Hopkins University Connect to Campus Poster Session, Baltimore, MD, October 2024
- Poster Presenter, Johns Hopkins University Institute for Data-Intensive Engineering and Science (IDIES) Annual Symposium, Baltimore, MD, October 2024
- Oral & Poster Presenter, National GEM Consortium Annual Conference, San Antonio, TX, September 2024
  - **Acheson J. Duncan Fund for the Advancement of Research in Statistics Award**

**Odedoyin O.**, Cárdenas E., Ocampo Giraldo L., Greenhalgh M., Hix J. "Predicting Solution Color in Solvent Extraction using Machine Learning and Non-Traditional Sensor Measurements,"

- Oral Presenter, American Nuclear Society Winter Conference & Expo: Radiation Protection and Shielding Division, Orlando, FL, November 2024
  - **Acheson J. Duncan Fund for the Advancement of Research in Statistics Award**
- Poster Presenter, Johns Hopkins University Design Day Conference, Baltimore, MD, May 2024
- Oral Presenter, American Nuclear Society Student Conference, State College, PA, April 2024
  - **Acheson J. Duncan Fund for the Advancement of Research in Statistics Award**
- Poster Presenter, NYC Future Energy Conference, New York, NY, March 2024
- Poster Presenter, Mid-Atlantic Research Exchange (MATRX), Baltimore, MD, March 2024
- Poster Presenter, Johns Hopkins University IDIES Annual Symposium, Baltimore, MD, October 2023
- Oral Presenter, Johns Hopkins University Applied Mathematics and Statistics Departmental Seminar, Baltimore, MD, October 2023
- Oral & Poster Presenter, National GEM Consortium Annual Conference, Philadelphia, PA, September 2023
  - **NSF Grant Award**
- Poster Presenter, Annual Idaho National Laboratory Intern Poster Session, Idaho Falls, ID, August 2023
  - **Awarded 1st Place for Best Poster under the Nuclear Research & Experiments Division**

Karthic M, Killanin D, **Odedoyin O.** "The Promising Future of Fintech in Closing the Racial Wealth Gap,"

- Oral Presenter, Association for Financial Counseling and Planning Education (AFCPE) Symposium, Orlando, FL, November 2022

**Odedoyin O.**, Lauer, AM "Quantifying Top-down Neural Input to the Cochlea in Kabuki Syndrome Mice Model,"

- Poster Presenter, Ingenuity Project Math and Science Symposium, Baltimore, MD, May 2019

Villavisanis DF, Schröde KM, **Odedoyin O.**, Xu-Friedman M, Lauer AM. "Olivocochlear System Plasticity in Response to Chronic Noise,"

- Oral Presenter, Acoustical Society of America 176th Annual Meeting, Victoria, BC, Canada, November 2018
- Poster Presenter, Eastern Auditory Retreat 17th Annual Meeting, New York, NY, June 2018

**Odedoyin O.** "Quantifying Efferent Neurons to Analyze the Potential of Hearing Loss Amplification in Kabuki Syndrome,"

- Poster Presenter, Ingenuity Project Math and Science Symposium, Baltimore, MD, May 2018
- Poster Presenter, Baltimore Science Fair, Baltimore, MD, March 2018

Villavisanis DF, Schröde KM, **Odedoyin O.**, Xu-Friedman M, Lauer AM. "Innervation and Plasticity of the Olivocochlear System,"

- Oral Presenter, Acoustical Society of America 11th Conference on Acoustics, Washington DC, April 2018
  - **Second Prize for Best Paper**

Villavisanis DF, Schröde KM, **Odedoyin O.**, Xu-Friedman M, Lauer AM. "Efferent Innervation of the Cochlea: Noise & Plasticity,"

- Poster Presenter, Day of Undergraduate Research in Engineering, the Arts & Humanities, Medicine, and the

Sciences (DREAMS), Baltimore, MD, April 2018

Villavisanis DF, Schrode KM, **Odedoyin O**, Javaid H, Xu-Friedman M, Lauer AM. "Effects of Noise on Olivocochlear Feedback to the Cochlea,"

- Oral Presenter, Association for Research in Otolaryngology 41st Annual Meeting, Student Blitz, San Diego, CA, February 2018
- Poster Presenter, Association for Research in Otolaryngology 41st Annual Meeting, Inner Ear: Anatomy & Physiology Poster Session (713), San Diego, CA, February 2018
- Oral Presenter, St. Vincent's Hospital Otolaryngology Meeting, Sydney, Australia, October 2017

## **TEACHING EXPERIENCE**

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### **Johns Hopkins University**

*Teaching Assistant*

Professor: Beryl Castello, Ph.D.

Course: Mathematical Modeling and Consulting EN.553.400/600

Baltimore, MD

January 2024 – May 2024

## **RESEARCH EXPERIENCE**

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### **Histology AI Analysis Laboratory Assistant**

February 2025 – Present

*Johns Hopkins University School of Medicine*

Baltimore, MD

Advisor(s): Amanda Lauer, Ph.D., George S. Liu, M.D.

- Designed and trained DL models for 3D reconstruction & segmentation of temporal bone histology to study Meniere's disease.
- Improved accuracy and speed of non-linear image registration and tissue segmentation pipelines by integrating MATLAB preprocessing with Python, TensorFlow, and OpenCV workflows.
- Curated and managed large-scale histology datasets, enabling reproducible experiments in tissue classification, spatial mapping, and cross-sample comparison.
- Collaborated with researchers on CODA-based visualization workflows, enhancing interpretability of 3D reconstructions for auditory system studies.
- Assisting in the preparation of research presentations, reports, and potential publications on ML-driven approaches to otopathology and histology image processing.

### **Molten Salt Reactor Data Science Graduate Research Assistant**

May 2024 – September 2025

*Idaho National Laboratory (INL) & Johns Hopkins University*

Idaho Falls, ID/Baltimore, MD

Advisor(s): Ramon K. Yoshiura, Ph.D., Benjamin Grimmer, Ph.D.

### **Predictive Modeling for Enhanced Monitoring of Molten Salt Reactor Sensors (MSRs)**

- Developed ML models to predict peak current and solute percent in electrochemical data from molten salt reactors (MSRs) to optimize sensor calibration and fuel monitoring processes, and inform MSR future development in enhanced real-time monitoring and operational efficiency
- Analyzed and managed data pre-processing and exploratory data analysis of cyclic voltammetry (CV) data from MSR experiments, studying electrochemical properties of molten salts to ensure high data quality and reliability for model training.
- Conducted feature selection and engineered unified value for chemical compounds features to improve model training accuracy.
- Engaged in literature reviews on MSR technologies and electrochemical behavior for stronger research findings.

- Presented research findings in an academic paper and at conferences.

**Nuclear Non-Proliferation Data Science Graduate Research Assistant**

*Idaho National Laboratory (INL)*

Advisor(s): Luis C. Ocampo Giraldo, Ph.D., Edna Cardenas, Ph.D.

June 2023 – May 2024

Idaho Falls, ID/Baltimore, MD

**Predictive Modeling for Centrifugal Contactor Solvent Extraction**

- Conducted extensive research on solvent extraction processes involving centrifugal contactors and developed machine learning predictive models for solution color, enhancing process monitoring and control, and contributing to the design optimization of a solvent extraction testbed for non-proliferation.
- Managed and processed large datasets from various solvent extraction experiments, involving meticulous data cleaning, pre-processing, anomaly detection, and refinement to ensure robust and reliable input for machine learning model training.
- Conducted thorough correlation analysis among various sensor readings, visualizing these relationships for intuitive understanding and informing predictive model development.
- Presented research findings in an academic paper and at conferences, receiving 1st Place for Best Poster under the Nuclear Research & Experiments division at the INL Intern Poster Session

**Data Research Lead**

*Pink AI Inc.*

Advisor(s): Juliana Echavarria

September 2023 – December 2023

(Remote) Dover, DE

**Data Management for PinkAI**

- Led the identification, acquisition, and refinement of high-quality data sources for AI training datasets, applying rigorous legal and ethical standards to enhance AI's analytical and predictive capabilities.
- Engineered and managed a data pipeline, overseeing data extraction, annotation, integration, and storage while maintaining data integrity and documenting security and compliance measures for seamless model integration.

**High Performance Computing Modeling and Simulation Graduate Research Intern**

*Idaho National Laboratory (INL)*

Advisor(s): Ramon K. Yoshiura, Ph.D.

June 2023 – September 2023

Baltimore, MD

**Dynamic System Scaling (DSS) for Integrated Energy Systems Scaling with Molten Salt Heat Storage**

- Conducted in-depth study and rederivation of Dynamic System Scaling (DSS) to better understand its application in energy system modeling.
- Successfully applied DSS to a molten salt air cooler, contributing to the accurate emulation of microreactor behavior in integrated energy systems.
- Authored significant sections of a theory methodology and results for an academic journal, demonstrating the successful application of DSS to a molten salt air cooler.
- Assisted in the quantitative assessment of energy system models, enhancing the understanding of their behavior in the context of integrated energy systems and microreactors.
- Contributed to a publication milestone due in August 2023, demonstrating the effective application of DSS to molten salt air coolers.
- Completed technical presentations in lab meetings and presented research findings in an intern poster session, effectively communicating complex technical concepts to a diverse audience.

**Data Analyst Intern**

*Johns Hopkins University, Johns Hopkins Underrepresented in Medical Professions (JUMP)*

Advisor(s): Shavonia Wynn Ph.D.

May 2022 – August 2022

Baltimore, MD

- Analyzed data from MCAT and DAT study preparation activity to visualize key metrics of 55 students' learning patterns to inform future strategies, including incentive measures

- Implementing MATLAB and VBA algorithms to clean dataset containing 35+ categories and visualize study activity
- Generated weekly reports for relevant departments to drive decision-making on 15+ projects
- Executed precision marketing to both existing and new grant donors and JUMP program members

### **Research Student**

*Johns Hopkins University Center for Leadership Education*

Baltimore, MD

January 2022 – November 2022

Advisor(s): Mia Russell, Ph.D.

- Evaluation of financial technology (fintech) service as a force for good in underserved communities by expanding financial access and reducing the racial wealth gap
- Conducted an in-depth literature review and analysis on the impact of fintech in reducing the racial wealth gap, focusing on expanding financial access and services in underserved communities.
- Investigated specific fintech products and their effectiveness in providing alternative credit assessments and financial services, facilitating wealth accumulation in low-income communities of color.
- Evaluated the role of strategic partnerships between fintech companies and nonprofits, emphasizing the importance of ethical fintech practices and their integration into financial counseling to enhance financial security and inclusion.

### **Reinforcement Learning Research Intern (CIRCUIT)**

*Johns Hopkins Applied Physics Laboratory*

Baltimore, MD

May 2020 – August 2021

Advisor(s): Kevin Rodrigues

- Collaborated on technical projects within a one-year cohort-based program to further understand the applications of artificial intelligence/machine learning concepts and build capabilities with TensorFlow, AWS, and PyTorch.
- Constructed algorithms for Deep Racer car models using machine learning on AWS to drive autonomously through reinforcement learning with reward functions written in Python
- Designed race car specifications to train models using a 3D simulator on the AWS DeepRacer console on Amazon and physical track to test physical models with downloaded algorithms for racing
- Optimizing reward function with a physical racetrack and hyper-parameters to achieve lap time under 30 seconds

### **Research Assistant/ Lab Technician**

*Johns Hopkins University School of Medicine, Lauer Lab*

Baltimore, MD

October 2017 – May 2020

Advisor(s): Amanda Lauer, Ph.D.

- Demonstrated efforts in immunohistochemistry by expanding skills with electron microscopy and data analytics of auditory and vestibular systems of mice
- Designed, managed, and executed experiments over 3 years to determine effects of kabuki syndrome on synaptic plasticity in olivocochlear systems
- Analyzed 1000+ confocal microscopy images with thresholding algorithms to yield conclusions on innervation density and morphology of auditory efferent systems
- Presented posters and oral talks at university and local conferences

## **LEADERSHIP/SERVICE**

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### **Huber Memorial Church,**

*Tape Ministry Soundboard Operator and Media Distribution*

Baltimore, MD

August 2019 - Present

- Manage soundboard operations for audio during services, including setup and breakdown of audio equipment.
- Prepare media distribution (CD) of sermons for dissemination after each service.

**Johns Hopkins University, Center for Student Success**

Baltimore, MD

*FLI Initiatives Program Coordinator*

January 2024 – May 2025

- Coordinated an automated system for the HopIn program's book loan, improving efficiency by 40%.
- Developed and maintained FLI website, boosting traffic by 25%.
- Planned and executed 15+ CSS events, increasing student participation by 30%.
- Drafted and proofread reports and communications, ensuring accuracy.

**Johns Hopkins University, Johns Hopkins University Underrepresented in Medical Professions**

Baltimore, MD

*Volunteer Mentor, Intern*

August 2020 – May 2023

- Facilitate informational workshops and academic mentorship to connect with 30-35 freshmen and help them navigate their first year
- Provide ample resources and leadership ensuring successful encouragement to pursue careers in medicine and other health professions
- Assemble 5 weekly reports reflecting beneficiaries' reception from programming with a purpose to provide academic support, mentoring, community building, career exploration, and leadership opportunities

**Moveable Feast**

Baltimore, MD

*Volunteer*

October 2021 – January 2022

- Assist kitchen staff prepare and package medically tailored meals including peeling and dicing vegetables, seasoning proteins, portioning meal ingredients into trays for packaging, sorting and bagging meals by diet plan.

**Johns Hopkins University National Society of Black Engineers**

Baltimore, MD

*Co-Conference Planning Chair, Current Member*

May 2020 – May 2021

- Coordinated conferences, general body meetings, and programming initiatives for 100+ undergraduate and graduate engineering students for the student chapter of the professional society.

**Johns Hopkins University, Thread Inc.**

Baltimore, MD

*Volunteer Mentor*

August 2019 – August 2020

- Facilitated development and execution of summer school curriculum for 16 high school students focused on career exploration, personal development, and financial literacy
- Composed and sent emails to students, volunteers and site supervisors regarding payment procedures, scheduling, and community updates using Mail Merge
- Conducted outreach to Baltimore non-profits for weekly speaker presentations

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**AFFILIATIONS/ MEMBERSHIP**

Member, Mathematical Institute for Data Science @ JHU (2024 – Present)

Member, Society for Industrial and Applied Mathematics (2024 – Present)

Member, The Institute for Data Intensive Engineering and Science @ JHU (2023 – Present)

Member, American Nuclear Society (2023 – 2025)

Member, Graduate Black Student Union, Johns Hopkins University (2023 – Present)

Member, Association for Financial Counseling and Planning Education (2022 – 2023)

Member, National Society of Black Engineers, Johns Hopkins University (2019 – Present)

## **TECHNICAL SKILLS**

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### **Computational**

Python (scikit-learn, pandas, numpy, matplotlib, pytorch, openai), C/C++, Java, MATLAB, R, Unix, Git, Excel, FL Studio, Microsoft Office Suite, LaTeX

### **Wet Laboratory**

Immunohistochemistry techniques (tissue collection, perfusion, fixation with formaldehyde, and embedding using paraffin wax, sectioning using and mounting, e-paraffinization and epitope (antigen) retrieval, IHC immunodetection) electron microscopy techniques for quantifying activity-dependent changes in the morphology of peripheral and central auditory synapses

## **LANGUAGES**

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French (Proficient)

Yoruba (Conversational)

Isoko (Conversational)