

Moussa Doumbia

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Education

- **Ph.D. in Mathematics**, Howard University, 2017
- **Bachelor's Degree in Mathematics**, University of the District of Columbia (UDC), 2007

Highlights

- Visiting Professor at The United States Military Academy West Point, NY
- Developed, implemented, and taught an introductory data science course.
- Created a mathematics major with a concentration in data science.
- Faculty member of the Virtual Applied Data Science Training Institute (VADSTI).
- Participant in the Microsoft Visiting Data Science Professor Program (Summer 2021).
- Co-creator of Howard University's Coursera course: Linear Algebra for Data Science Using Python.
- Team member of Howard University, University Of Delaware, and NSA's Social Network Research Program (2020-2021).
- Co-investigator for NIH/NIMHD grant: Enhancing Data Science Capability and Application at Howard University (Grant: 3U54MD007597-33S2, Award Amount: \$386,250.00).
- Awarded GRT000313 National Research Experience for Undergraduates Program (NREUP), Award Amount: \$28,999.00.

Employment

United States Military Academy West Point, NY

- Visiting Professor, Department of Mathematics (June 2024 - June 2025)

Howard University, Washington, DC

- Master Instructor, Department of Mathematics (Fall 2023 - present)
- Lecturer, Department of Mathematics (Fall 2017 - Spring 2023)
- Chair of the Graduate Students' Seminar (2015)

Research Interests

Machine Learning, Quantum Computing, Differential privacy, applications of ordinary differential equations to model infectious diseases, and applications of optimal control theory to vector-borne diseases.

Publications

1. Moussa Doumbia and Abdul-Aziz Yakubu "Asymptomatic Malaria Infections in Pregnant Women of Ngbo in Ohaukwu Local Government Area of Ebonyi State, Nigeria" *Springe Nature - La Matematica* 10.1007 s44007- 024 - 00147 - 5 28 January 2025.
2. Moussa Doumbia and Abdul-Aziz Yakubu, "Malaria Incidence and Anopheles Mosquito Density in Irrigated and Non-Irrigated Villages of Niono in Mali," *Discrete and Continuous Dynamical Systems - Series B (DCDS-B)*, Vol. 22, No. 1, January 2017.
3. Jake Beckman, Joseph Dorta, Moussa Doumbia, and Diana Thomas "Something Old Something New: Reviewing the genetics and exercise literature with AI" *Springer Nature Manuscript number: NREND-23-352V1* (Submitted).
4. Moussa Doumbia "Application of Quantum Cryptographic Protocols in Secure Multi-Party Computation" (in progress).

Student Projects

- Statistical Significance and Predictive Modeling: An Advanced EDA and Machine Learning Approach to COVID-19 Data Analysis (Summer 2023).
- COVID-19 Prediction using SEIRAF Model (Summer 2023).

Awards and Achievements

- Outstanding Faculty of the Mathematics Department (2021-2022).
- Best Oral Presenter Award, Research Day at Howard University (April 2013).
- Outstanding Poster Presenter Award, South Africa - US Conference in Mathematical Methods in Systems Biology and Population Dynamics, Cape Town (January 2012).
- Visiting Scholar, Mathematical Biosciences Institute, Ohio State University (January 2011 - August 2011).
- Edward A. Bouchet Fellowship, Howard University (2008-2013).

Invited Talks

- Joint Mathematics Meetings: "Asymptomatic Malaria Infections in Pregnant Women of Ngbo in Ohaukwu Local Government Area of Ebonyi State, Nigeria," Baltimore Convention Center (2019).
- AMS Special Session: "Malaria Incidence and Anopheles Mosquito Density in Irrigated and Adjacent Non-Irrigated Villages of Niono in Mali," Georgetown University (2015).

Conference Activity

- Panels Organized: NSF-CBMS Regional Conference on Mathematical Biology: Modeling and Analysis, Howard University (May 2018).
- Discussant: CCICADA Annual Meeting, Command, Control Interoperability Center for Advanced Data Analysis, Howard University (2017).

Presentations

- Workshop on Precision Medicine: "Asymptomatic Malaria Infections in Pregnant Women of Ngbo in Ebonyi State, Nigeria," Howard University (April 2016).
- SACNAS National Conference: "Malaria Incidence and Anopheles Mosquito Density in Irrigated and Adjacent Non-Irrigated Villages of Niono in Mali," Gaylord National Resort and Convention Center (October 2015).
- MPE 2013+ Workshop on Management of Natural Resources: "Malaria Incidence and Anopheles Mosquito Density in Irrigated and Adjacent Non-Irrigated Villages of Niono in Mali," Howard University (June 2015).

Workshops Attended

- Workshop on Using Data to Drive Reform Through Prosecutorial Performance, Atlanta University Consortium, Atlanta (June 2022).
- Modeling Neuropathies and Neuropsychiatric Illnesses, Howard University (April 2017).
- Frontiers in Mathematical Oncology: Young Investigator's Conference, University of Maryland, College Park (April 2017).
- KI-Net Conference: Groups and Interactions in Data, Networks, and Biology, jointly sponsored by Ki-Net and the Center for Nonlinear Analysis, Carnegie Mellon University (May 2015).
- Workshop on Modeling Infectious Diseases, Howard University (December 2016).
- Workshop on Precision Medicine, Howard University (April 2016).
- Workshop on the Treatment of Cancer, Howard University (December 2015).

Teaching Experience

- Differential Equations For Engineering MA364 (Spring 2025, US Military Academy West Point)
- Natural Language Processing (NLP), Multi Variables and Vectors calculus (MA205) (Fall 2024, US Military Academy West Point)
- Introduction to Data Science, Applied Calculus, College Algebra I, and Pre-Calculus (Fall 2023).
- Introduction to Data Science, Applied Calculus, College Algebra I II (Spring 2023).
- Introduction to Data Science, Applied Calculus, College Algebra I II, Pre-Calculus II (Fall 2022).
- Introduction to Linear Algebra, Introduction to Data Science, Applied Calculus, College Algebra I II (Fall 2022).

- Probability and Statistics, Calculus III (Summer 2022).
- Introduction to Data Science, Applied Calculus, College Algebra I II (Spring 2022).
- Introduction to Data Science (Fall 2021), Seminar - Comp Data Sci II (Spring 2021), Applied Calculus (Spring 2021).
- Topics in Applied Mathematics (Fall 2020), Applied Calculus (Fall 2020), College Algebra I (Fall 2020). Calculus I STEM (Summer 2020).
- Pre-Calculus (Summer 2020).
- Pre-Calculus (Spring 2019), College Algebra I (Spring 2019).
- Applied Calculus (Fall 2018), Pre-Calculus (Fall 2018), College Algebra I (Fall 2018).
- Calculus III (Summer 2018), College Algebra II (Summer 2018).
- Pre-Calculus (Spring 2018), College Algebra I (Spring 2018), College Algebra II (Spring 2018).
- Probability and Statistics (Fall 2017), Applied Calculus (Fall 2017), College Algebra I (Fall 2017).
- Calculus III (Summer 2017), College Algebra I (Summer 2017), College Algebra II (Summer 2017).