Abdallah Alsammani

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A dedicated and interdisciplinary researcher with over nine years of teaching and research experience in biostatistics, data science, and mathematical biology. I specialize in developing and applying statistical and machine learning models to investigate complex biological systems and public health challenges. My expertise includes mathematical modeling, high-dimensional data analysis, and computational methods for biomedical research. With a strong foundation in applied mathematics and a passion for translational research, I am committed to advancing data-driven, cross-disciplinary solutions in medicine, epidemiology, and health sciences.

PROFESSIONAL EXPERIENCE

Assistant Professor (Tenure-Track) — Aug 2025 – Present
Department of Mathematical Science, Delaware State University, Dover, DE

Assistant Professor of Data Science — Aug 2022 – Jul 2025
School of Science and Mathematics, Jacksonville University, Jacksonville, FL

Postdoctoral Research Associate — Jan 2022 – July 2022
Department of Infectious Diseases, University of Georgia, Athens, GA

Postdoctoral Research Associate — Jan 2021 – Jan 2022
Department of Neurosurgery, University of Nebraska Medical Center, Omaha, NE

Graduate Teaching Assistant (Instructor) — Aug 2014 – Dec 2020
Department of Mathematics and Statistics, Auburn University, Auburn, AL

Lecturer of Mathematics and Statistics — Aug 2012 – Aug 2013
Al Neelain University, Khartoum, Sudan

Lecturer of Applied Mathematics — Aug 2012 – Aug 2013
Academy of Engineering and Medical Sciences, Khartoum, Sudan

Teaching Assistant — Jan 2010 – Aug 2011
Al Neelain University & Academy of Engineering and Medical Sciences, Khartoum, Sudan

EDUCATION

Ph.D. in Applied Mathematics — 2020
Auburn University, Auburn, AL.

Postgraduate Diploma (Pre-Ph.D.) in Mathematics — 2014
International Centre for Theoretical Physics (ICTP), Trieste, Italy.

M.Sc. in Applied Mathematics — 2012
African Institute for Mathematical Sciences (AIMS), Senegal.

B.Sc. in Mathematics (Honors) — 2009
Al Neelain University, Khartoum, Sudan.

RESEARCH INTERESTS

My research integrates biostatistics, data science, machine learning, and mathematical biology to address complex challenges in biological systems, public health, and medicine. I focus on developing and applying statistical and computational models for systems biology, infectious disease dynamics, medical imaging, and neuroscience. My work aims to bridge theoretical frameworks with real-world biomedical data, enabling the design of innovative algorithms, predictive tools, and analytical methods that advance precision health and interdisciplinary research in the life sciences.

SKILLS

Programming
MATLAB, Python, R, SAS, C++, Scilab, BEAST

Data Analytics and Quantitative Skills
Data Visualization, Machine Learning, Deep Learning, Statistical Analysis, Data Mining, Data Management, Problem Solving.

Operating Systems
Windows, Linux (Ubuntu & Mint), MacOS

ONLINE AND SELF-LEARNING

Biostatistics Certificate Completed

Johns Hopkins University (Coursera)
- Summary Statistics in Public Health
- Hypothesis Testing in Public Health
- Simple Regression Analysis in Public Health
- Multiple Regression Analysis in Public Health

FlexStack: Python Fundamentals Certificate Completed

Georgia Institute of Technology (Georgia Tech)
- FlexStack: Python Fundamentals 1 – *Snaking Your Way into Python (INTD 4001P)*
- FlexStack: Python Fundamentals 2 – *Stringing Along Your Data and Stretching with Modules (INTD 4002P)*
- FlexStack: Python Fundamentals 3 – *Slithering Along the Information Superhighway (INTD 4003P)*

Google Data Analytics Certificate In Progress (5 out of 8 courses completed)

Google/Coursera Professional Certificate Program

PUBLICATIONS & PROJECTS

Peer-Reviewed Publications

1. **Alsammani, Abdallah**, Calistus N. Ngonghala, and Maia Martcheva. "Impact of vaccination behavior on COVID-19 dynamics and economic outcomes." Mathematical Biosciences and Engineering 22, no. 9 (2025): 2300-2338.

2. Goodyear, S. ; **Alsammani, A.** (2025). "Predicting Sleep Disorders Using Machine Learning: A Comparative Analysis". In: Gervasi, O., et al. Computational Science and Its Applications – ICCSA 2025. ICCSA 2025. Lecture Notes in Computer Science, vol 15648. Springer, Cham. doi.org/10.1007/978-3-031-97000-9_7

3. **A. Alsammani**, W. C. Stacey, and S. V. Gliske, "Estimation of Circular Statistics in the Presence of Measurement Bias," *IEEE Journal of Biomedical and Health Informatics*, 2023. doi:10.1109/JBHI.2023.3334684

4. Alflahi, A. A. E., Mohammed, M. A. Y., and **A. Alsammani**, "Enhancement of Database Access Performance by Improving Data Consistency in a Non-Relational Database System (NoSQL)," *Computational Science and Its Applications – ICCSA 2024*, Springer.

5. **A. Alsammani**, "Mathematical Analysis of Autonomous and Nonautonomous Hepatitis B Virus Transmission Models," *Computational Science and Its Applications – ICCSA 2023*, Springer.

6. Tyner, K., **A. Alsammani**, et al., "The Impact of Intracranial EEG on Sleep..." *SLEEP*, 45: A255–A255, 2022.

7. **A. Alsammani**, *Dynamical Behavior of Nonautonomous and Stochastic HBV Infection Model*, Ph.D. Dissertation, Auburn University, 2020.

8. Abdulrashid, I., **A. A. M. Alsammani**, and X. Han, "Stability Analysis of a Chemotherapy Model with Delays," *Discrete and Continuous Dynamical Systems - B*, 24(3): 989–1005, 2019.

Preprints & Under Review

1. **Abdallah Alsammani**, Gassan AMO Farah, Mohammed AY Mohammed, and Mehmet Yavuz. "Cholera Transmission Dynamics with Sanitation Control Measures." arXiv preprint arXiv:2505.08873 (2025).

2. Mohammed, M., **A. Alsammani**, et al., "Coexistence via Trophic Cascade in Plant-Herbivore-Carnivore Systems," *arXiv:2408*, 2024.

3. **A. Alsammani**, "Stochastic Modeling and Computational Simulations of HBV Infection Dynamics," *arXiv:2308.05819*, 2023. (Under Review)

In Progress

- *An Optimal Control Analysis of a Two-Disease SIS Coinfection Model with Time Delays* (Submitted)

Dissertations

1. **"Dynamical Behavior of Nonautonomous and Stochastic HBV Infection Model."** Ph.D. dissertation, Auburn University, 2020.

2. **"Alexander Polynomials for Knots,"** Pre-Ph.D. Diploma Thesis, ICTP, Italy (2014).

3. **"Elliptic Curve Cryptography Under Finite Field,"** M.Sc. Thesis, AIMS-Senegal (2012).

4. **"Linear and Nonlinear Optimization Problems,"** B.Sc. Thesis, Al Neelain University, Sudan (2009).

Presentations and Posters

- Alflahi, A. A. E., M. A. Y. Mohammed, and A. Alsammani, *ICCSA*, July 2024 (Talk)

- A. Alsammani, *ICCSA*, July 2023 (Talk)

- A. Alsammani, "An Exploration of Mathematical Modeling," SPi Mu Epsilon Induction Ceremony, Jacksonville University, April 2024 (Talk)

- A. Alsammani, "Dynamical Analysis of the Hepatitis B Virus Infection Model," SELS, Jacksonville University, 2023 (Talk)

- Tyner, K., A. Alsammani, et al. "The Impact of Intracranial EEG on Sleep..." SLEEP 45, 2022 (Poster)

- A. Alsammani et al., "Effect of Sleep Stage on High-Frequency Oscillations and Artifacts," AES Annual Meeting, 2021 (Poster)

- A. Alsammani, "Stability Analysis of Hepatitis B Virus," COSAM Interdisciplinary Colloquium, Auburn University, 2019 (Talk)

UNDERGRADUATE RESEARCH SUPERVISION AT JACKSONVILLE UNIVERSITY

Independent study research on	Spring 2025
Independent study research on Data Analysis and Visualization for Animal Shelter Outcomes	Spring 2025
Independent study research on Independent study research on "Statistical Learning	Fall 2024
Internship Sponsor	Fall 2024
Independent study research on "Data Analytics on Road Accidents visualization."	Fall 2023
Independent study research on "Introduction to Data Science and Prediction Algorithms in R.	Fall 2023
Internship Sponsor	Fall 2023
Independent study research on "NFL Game Prediction Model using SVD	Spring 2023

HONORS & AWARDS

Grant for Scholarship of Teaching and Learning (SOTL) Jacksonville University, FL	2023 – 2025
Excellence in Teaching Award Department of Mathematics and Statistics, Auburn University, AL	2019 – 2020
Teaching Assistantship Department of Mathematics and Statistics, Auburn University, AL	2014 – 2020
Pre-Ph.D. Scholarship in Mathematics ICTP, Trieste, Italy	2013 – 2014
M.Sc. Scholarship in Applied Mathematics AIMS-Senegal, Mbour, Senegal	2011 – 2012
Outstanding Undergraduate Student Award Al-Neelain University, Khartoum, Sudan	2004 – 2009

UNIVERSITY & DEPARTMENTAL SERVICE AND OUTREACH

Member, Planning and Budget Committee 2024 – 2025
Jacksonville University, FL

Member, Artificial Intelligence (AI) Taskforce Committee 2023 – 2024
Jacksonville University, FL

Search Committee Member, Assistant Professor (Computing Science) 2023 – 2024
Davis College of Business, Jacksonville University, FL

Search Committee Member, Assistant Professor (Mathematical Physics) 2023 – 2024
Department of Mathematics, Jacksonville University, FL

Search Committee Member, Assistant Professor (Oceanography) 2023 – 2024
Department of Marine Science, Jacksonville University, FL

Search Committee Member, Assistant Dean Position 2022 – 2023
Davis College of Business, Jacksonville University, FL

Search Committee Member, Visiting Assistant Professor Position 2022 – 2023
Department of Mathematics, Jacksonville University, FL

Applied Science Committee Member 2022 – 2023
College of Arts and Sciences, Jacksonville University, FL

Undergraduate Research Supervision 2022 – Present
Guided eight students in independent research projects, strengthening their analytical and computational skills.

Program Assessment Lead (Data Science) 2022 – Present
Oversee continuous improvement and accreditation alignment for Data Science major and minor programs.

Event Coordinator, Regional Science Olympiad March 2017
Auburn University, AL

Organizer Member, 52nd Spring Topology and Dynamical Systems Conference March 2018
Auburn University, AL

Development of Data Science Certificate Program 2023
Jacksonville University, FL

TEACHING EXPERIENCE

Courses Taught Jacksonville University 2022 – Present
As an Assistant Professor of Data Science and Mathematics at Jacksonville University, I taught the following courses

* **Spring 2025:**
  · MATH 470: Machine Learning Algorithms
  · MATH 270: Introduction to Data Science
  · MATH 170: Data Science Foundations
  · MATH 481WS: Capstone Research Project
  · MATH 487RI: Independent Study
* **Fall 2024:**
  · MATH 331-101: Differential Equations
  · MATH 331-103: Differential Equations
  · MATH 270: Introduction to Data Science
  · MATH 170: Data Science Foundations

· MATH 487RI: Independent Study
* **Summer 2024:**
  · MATH 205: Elementary Statistics
* **Spring 2024:**
  · MATH 270: Introduction to Data Science
  · MATH 170: Data Science Foundations
  · MATH 490: Internship Sponsor
* **Fall 2023:**
  · MATH 420: Linear Algebra II
  · MATH 240: Calculus III
  · MATH 170: Data Science Foundations

- · MATH 487RI: Independent Study
- · MATH 490: Internship Sponsor
- ∗ **Spring 2023:**
  - · MATH 315: Probability
  - · MATH 240: Calculus III

- · MATH 487RI: Independent Study
- ∗ **Fall 2022:**
  - · MATH 270: Introduction to Data Science
  - · MATH 170: Data Science Foundations
  - · MATH 240: Calculus III

Courses Taught Auburn University   2014 – 2020

As an Instructor of Record and Graduate Teaching Assistant at Auburn University, I taught the following courses:

Instructor of Record:

- ∗ Calculus III
- ∗ Calculus II
- ∗ Calculus I
- ∗ Pre-Calculus
- ∗ College Algebra

Graduate Teaching Assistant (GTA):

- ∗ Introduction to Statistics
- ∗ Linear Algebra
- ∗ Differential Equations

In addition, I supervised the Auburn University Tutoring Center for two semesters, supporting all undergraduate students in mathematics and statistics.

Overseas Teaching Experience (Sudan)   2010 – 2013

As a Lecturer at Al-Neelain University and the Academy of Engineering and Medical Sciences, I taught the following courses
- ∗ Matlab Programming
- ∗ Introduction to Statistics
- ∗ Real Analysis
- ∗ Topology
- ∗ Number Theory,
- ∗ Mathematical Methods,
- ∗ Abstract Algebra.

REFERENCES

Available upon request.