

# Abdallah Alsammani

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A dedicated and interdisciplinary mathematician and data scientist with over a decade of teaching experience, strong quantitative modeling skills, and a proven track record in research. I am committed to advancing knowledge through collaborative research and impactful instruction because I specialize in mathematical modeling, applied statistics, data science, and machine learning. My work bridges theory and application in biology, medicine, economics, and technology, and I am eager to contribute to innovative, data-driven solutions in diverse academic environments.

## PROFESSIONAL EXPERIENCE

<b>Assistant Professor of Data Science</b> School of Science and Mathematics, Jacksonville University, Jacksonville, FL <ul style="list-style-type: none"><li>Design and teach courses in Data Science and Mathematics.</li><li>Lead and mentor undergraduate research, focusing on interdisciplinary applications and practical analytics.</li><li>Contribute to curriculum development, accreditation assessment, and departmental service.</li></ul>	Aug 2022 – Present
<b>Postdoctoral Research Associate</b> Department of Infectious Diseases, University of Georgia, Athens, GA <ul style="list-style-type: none"><li>Conducted epidemiological modeling and data analysis for CDC-contracted projects.</li><li>Prepared monthly research reports and data-driven insights for the CDC.</li><li>Managed a research group of seven Ph.D. students, fostering productivity and collaboration.</li></ul>	Jan 2022 – July 2022
<b>Postdoctoral Research Associate</b> Department of Neurosurgery, University of Nebraska Medical Center, Omaha, NE <ul style="list-style-type: none"><li>Developed computational models in neuroscience, focusing on real-time data from the operating room.</li><li>Streamlined data collection and analysis procedures, enhancing the precision of clinical research.</li></ul>	Jan 2021 – Jan 2022
<b>Graduate Teaching Assistant (Instructor)</b> Department of Mathematics and Statistics, Auburn University, Auburn, AL <ul style="list-style-type: none"><li>Independently taught undergraduate courses in Mathematics and Statistics.</li><li>Provided academic support through tutoring centers, improving student performance and retention.</li></ul>	Aug 2014 – Dec 2020
<b>Lecturer of Mathematics and Statistics</b> Al Neelain University, Khartoum, Sudan <ul style="list-style-type: none"><li>Instructed undergraduate courses in Mathematics, Programming, and Statistics.</li><li>Engaged in academic advising and departmental service to strengthen program quality.</li></ul>	Aug 2012 – Aug 2013
<b>Lecturer of Applied Mathematics</b> Academy of Engineering and Medical Sciences, Khartoum, Sudan <ul style="list-style-type: none"><li>Taught foundational and applied courses in Mathematics and Statistics.</li></ul>	Aug 2012 – Aug 2013
<b>Teaching Assistant</b> Al Neelain University & Academy of Engineering and Medical Sciences, Khartoum, Sudan	Jan 2010 – Aug 2011
<b>Secretary of Academic Office</b> Academy of Engineering and Medical Sciences, Khartoum, Sudan <ul style="list-style-type: none"><li>Coordinated academic calendars, communications, and record-keeping.</li><li>Supported administrative functions to enhance academic operations.</li></ul>	Jan 2010 – Aug 2011

## EDUCATION

<b>Ph.D. in Applied Mathematics</b> Auburn University, Auburn, AL.	2020
<b>Postgraduate Diploma (Pre-Ph.D.) in Mathematics</b> International Centre for Theoretical Physics (ICTP), Trieste, Italy.	2014
<b>M.Sc. in Applied Mathematics</b> African Institute for Mathematical Sciences (AIMS), Senegal.	2012
<b>B.Sc. in Mathematics (Honors)</b> Al Neelain University, Khartoum, Sudan.	2009

## 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

## 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, Microsoft Office

### Operating Systems

Windows, Linux (Ubuntu & Mint), MacOS

## PUBLICATIONS & PROJECTS

### Peer-Reviewed Publications

1. **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](https://doi.org/10.1109/JBHI.2023.3334684)
2. 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.
3. **A. Alsammani**, "Mathematical Analysis of Autonomous and Nonautonomous Hepatitis B Virus Transmission Models," *Computational Science and Its Applications – ICCSA 2023*, Springer.
4. Tyner, K., **A. Alsammani**, et al., "The Impact of Intracranial EEG on Sleep..." *SLEEP*, 45: A255–A255, 2022.
5. **A. Alsammani**, *Dynamical Behavior of Nonautonomous and Stochastic HBV Infection Model*, Ph.D. Dissertation, Auburn University, 2020.
6. 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* — with Ismail Abdurashid
- *Impact of Vaccination Behavior on COVID-19 Dynamics and Economic Outcomes* — with Maia Martcheva and Calistus Ngonghala
- *Cholera Transmission Dynamics with Sanitation Control Measures* — with Gassan Farah

**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**

- Alfahi, 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**

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

## HONORS & AWARDS

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

## UNIVERSITY & DEPARTMENTAL SERVICE AND OUTREACH

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<b>Member, Planning and Budget Committee</b> Jacksonville University, FL	2024 – 2025
<b>Member, Artificial Intelligence (AI) Taskforce Committee</b> Jacksonville University, FL	2023 – 2024
<b>Search Committee Member, Assistant Professor (Computing Science)</b> Davis College of Business, Jacksonville University, FL	2023 – 2024
<b>Search Committee Member, Assistant Professor (Mathematical Physics)</b> Department of Mathematics, Jacksonville University, FL	2023 – 2024
<b>Search Committee Member, Assistant Professor (Oceanography)</b> Department of Marine Science, Jacksonville University, FL	2023 – 2024
<b>Search Committee Member, Assistant Dean Position</b> Davis College of Business, Jacksonville University, FL	2022 – 2023
<b>Search Committee Member, Visiting Assistant Professor Position</b> Department of Mathematics, Jacksonville University, FL	2022 – 2023
<b>Applied Science Committee Member</b> College of Arts and Sciences, Jacksonville University, FL	2022 – 2023
<b>Undergraduate Research Supervision</b> Guided eight students in independent research projects, strengthening their analytical and computational skills.	2022 – Present
<b>Program Assessment Lead (Data Science)</b> Oversee continuous improvement and accreditation alignment for Data Science major and minor programs.	2022 – Present
<b>Event Coordinator, Regional Science Olympiad</b> Auburn University, AL	March 2017
<b>Organizer Member, 52nd Spring Topology and Dynamical Systems Conference</b> Auburn University, AL	March 2018
<b>Development of Data Science Certificate Program</b> Jacksonville University, FL	2023

## TEACHING EXPERIENCE

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### 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

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Available upon request.