

# ANDREWS K. BOAHEN

East Lansing, MI, USA



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AndrewsBoahen



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## RESEARCH INTERESTS

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**Computer model calibration, Bayesian inverse problems, Uncertainty quantification, AI-Powered & Monte Carlo Inference, Active Learning, Bayesian Optimization and Deep Learning.** Application areas include engineering sciences, digital twins and mission-critical physical systems.

## EDUCATION

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**Ph.D. Statistics (with M.Sc. en route),** MICHIGAN STATE UNIVERSITY East Lansing, MI

**Grade:** 3.902/4.0

**Expected:** May 2027

**Advisor:** Dr. Chih-Li Sung

**Tentative Thesis Title:** Novel Methods in Computer Model Calibration and Related Topics.

**M.Sc. Mathematical Sciences,** AFRICAN INSTITUTE FOR MATHEMATICAL SCIENCES Santoe, Greater Accra

**Grade:** 91%

**Conferred:** July 2021

**Thesis:** Large deviations for spatial telecommunication systems: The Boolean model.

**Advisor:** Prof Kwabena Doku-Amponsah

**B.Sc. Actuarial Science,** UNIVERSITY OF GHANA East Legon, Greater Accra

**Grade:** 3.61/4.0

**Conferred:** May 2019

**Thesis:** Pricing a European put option via genetic algorithm.

**Advisor:** Prof Kwabena Doku-Amponsah

## PUBLICATIONS

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1. **Boahen, A.K.**, Heo, J. and Sung, C.-L. (In preparation). Active Learning for Nonlinear Computer Model Calibration.
2. **Boahen, A.K.**, Katsekor, T. and Doku-Amponsah, K. (2025). Large deviations for spatial telecommunication systems: The boolean model. *Journal of Information and Optimization Sciences*, 1-16. doi/10.47974/JIOS-1338.
3. **Boahen A.K.**, Davis IV, W. L. (2024). In Situ Machine Learning for Intelligent Data Capture and Event Detection. in *Computer Science Research Institute Summer Proceedings 2024*. M. B. P. Adams, T. A. Casey, and B. W. Reuter, eds. Technical Report SAND2024-16688O. Sandia National Laboratories, 2024, pp. 288–297.

## SELECTED TALKS

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\* [Invited/ Contributed talks are in blue](#)

1. [SIAM Conference on Uncertainty Quantification \(UQ26\)](#) (March 2026). Active Learning for Nonlinear Computer Model Calibration. (*Minneapolis, MN*).
2. [15th International Conference on Monte Carlo Methods and Applications](#) (July 2025). Active Learning for Nonlinear Calibration. (*Chicago, IL*).
3. [IMS/ASA Spring Research Conference](#) (May 2025). Active Learning for Nonlinear Calibration. (*New York, NY*).
4. CSRI Lightning Talks (July 2024). In Situ Machine Learning (ISML) for Intelligent Data Capture and Event Detection. (*Sandia National Laboratories, NM*).

## RESEARCH EXPERIENCE

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### Michigan State University

*Graduate Research & Course Projects*

East Lansing, MI

*Jan 2026 – May 2026*

- Developed an [interactive conformal prediction platform](#) with *Python's streamlit framework*, integrating various regression models.
- Developed an [open-source Python package](#) for Exact and Sparse Gaussian Process Regression, with an interactive app interface underway to extend accessibility to non-technical users.

### Michigan State University

*Research Assistant*

East Lansing, MI

*May 2025 – August 2025*

- Enhanced the predictive performance of our Non-Additive Calibration (NAC) emulator, achieving 50–60% accuracy improvement in high-dimensional computer experiments.
- Developed novel active learning strategies, derivative-free and MCMC/SGD-based methods to advance model calibration exercises.
- Engineered simulation pipelines for UQ in complex systems, reducing computational overhead across training and active learning workflows by 50%.

### Sandia National Laboratories

*Summer Intern – Scientific Machine Learning*

Albuquerque, NM

*June 2024 – August 2024*

- Extended ISML algorithms with manifold-learning signatures to enable robust, real-time event detection in nonlinear climate simulations, broadening the applicability of ISML to complex dynamical systems.
- Delivered a lightning talk on ISML algorithms and manifold-learning signatures for real-time event detection to 70 interns and researchers at Sandia's CSRI Summer Symposium.
- Published technical report in CSRI Summer Proceedings 2024 (SAND2024-166880).

### African Institute for Mathematical Sciences

*Research Master Student*

Santoe, Accra

*January 2022 – August 2022*

- Improved extreme value index estimation in Pareto-type distributions by developing a generalized Pickands estimator that reduced RMSE relative to Hill and bias-corrected Hill competitors across multiple regression frameworks.
- Rigorously characterized the generalized Pickands estimator through theoretical derivations and simulation studies, establishing consistency, unbiasedness, asymptotic normality, and convergence rates under Pareto-type tail assumptions.

## HONORS & AWARDS

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(2026) Selected as a **finalist for the Institute of Mathematical and Statistical Innovation (IMSI) Summer Graduate Student Internship program**, and funded to participate in the two-week Spring Coding and Data Science Bootcamp.

**Awarded** the Michigan State University **Graduate School Travel Fellowship** evaluated at \$1000.

(2025) Recipient of the **JMP-P&G Student-Early Career Travel Award** evaluated at \$600.

Elected as a **full member in Sigma Xi**, The Scientific Research Honor Society.

(2024) **Fellowship award** from the **Sustainable Research Pathways (SRP) summer program**.

(2022) Awarded the **research master student scholarship** for the best graduating student from AIMS-Ghana.

(2021) **Valedictorian, summa cum laude** for the 2021 graduation class at AIMS-Ghana.

**Winner** of the **Design Thinking Hub Hackathon** organized by AIMS-Ghana during graduation week.

Awarded the **F.K.A. Allotey Meritorious award** given to students with at least 6 distinctions (grade  $\geq 85\%$ ) in the review phase of the program and a distinction in their final essay.

- (2020) Awarded the **African Institute for Mathematical Sciences scholarship** estimated at \$25,000.
- (2019) **Winner** of the National Inter-tertiary Actuarial Quiz.
- (2016) Awarded the **UG Sponsorship Scholarship** for brilliant but needy students, covering tuition for the academic years 2016-2017, 2017-2018 and 2018-2019.
- (2011) Selected to be part of the **English Access Micro-Scholarship Program (Access)** sponsored by the U.S. department of State.

## SKILLS

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<b>Statistical Methods</b>	Gaussian & Deep Gaussian Process Modeling, Bayesian and Variational Inference, MCMC, Conformal Prediction.
<b>Optimization &amp; Design</b>	Sequential design/Active learning, Bayesian optimization and calibration, MCMC/SGD-based calibration, Optimal experimental design.
<b>Machine Learning</b>	Generative models, Manifold learning, CNNs/RNNs, Transformers.
<b>Programming</b>	RStudio, Python (PyTorch, Keras, TensorFlow), HPC.
<b>Languages</b>	English (Very fluent), French (Very fluent).

## TEACHING EXPERIENCE

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### Instructor, Michigan State University

- STT 200 Statistical Methods 2023 Summer

### Graduate Teaching Assistant, Michigan State University

- STT 200 Statistical Methods 2022F, 2023S, 2023F, 2024S, 2024F, 2025S, 2025F
- STT 882 Probability Theory II 2026S
- STT 872 Statistical Inference 2026S
- STT 843 Multivariate Data Analysis 2026S

### Graduate Teaching Assistant, University of Ghana

- STAT 446 Multivariate Methods 2020S
- STAT 608 Biostatistical Processes 2020S
- STAT 221 Introductory Probability I 2019F
- ACTU 407 Survival Analysis and Modelling 2019F
- STAT 451 Introduction to Stochastic Processes 2019F

## SERVICE & PROFESSIONAL AFFILIATIONS

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<b>Student Member</b>	IMSI, ASA, SIAM, Sigma Xi
<b>General Secretary</b>	African Graduate Student Association (2026 - 2027)
<b>Elected Student Representative</b>	MSU Statistics Colloquium Committee (2025 - 2026)
<b>Graduate Student Instructional Leader</b>	MSU STT Department (2025 - 2026)
<b>Graduate Student Mentor</b>	MSU STT Department (2023 - 2025)
<b>Mentor (Volunteer)</b>	Lumiere Education (2024-2025)
<b>Judge</b>	28th Annual University Undergraduate Research and Arts Forum (UURAF)
<b>Evaluator</b>	2025 Mid-Michigan Symposium for Undergraduate Research Experiences (MidSURE)
<b>Outreach</b>	12th Annual MSU Science Festival
<b>Outreach</b>	AIMS-Ghana Pi Day Science Event at Santoe
<b>Quiz Team Lead</b>	University of Ghana Actuarial Science Club

## MEDIA SPOTLIGHTS

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- Oct 2024** **Featured in** Summer 2024 Doctoral Student Internships. MSU Department of Statistics & Probability News. [Link](#)
- Jun 2024** **Featured Participant Profile.** Sustainable Research Pathways (SRP) Program. Sustainable Horizons Institute (2024 spotlight on program alumni/participants). [Link](#)
- Apr 2024** **Featured in Outreach Coverage.** STT Hosts Hands-on Event at MSU Science Festival. MSU STT Department News. [Link](#)
- Nov 2023** **Quoted in Department News.** Instructional Mentoring Program for PhD Students. MSU STT Department News . [Link](#)
- Jul 2021** **Featured as Overall Best Student and Valedictorian.** AIMS Ghana Holds its 9th Graduation Ceremony. African Institute for Mathematical Sciences (AIMS) Ghana News. [Link](#)

## REFERENCES

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Available upon request.