Godwin OSABUTEY

PERSONAL DATA

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NATIONALITY:	Ghanaian

EDUCATION

11/2020 - DATE	Doctor of Philosophy in MATHEMATICS **University of Bologna**, Italy Advisors: Prof. Pierluigi CONTUCCI, Prof. Cecilia VERNIA and Prof. Emanuele MINGIONE
01/2018 - 07/2020	Master of Philosophy in APPLIED MATHEMATICS **University of Energy and Natural Resources**, Ghana Thesis: "Mathematical modelling of energy conservation behaviour: A view from discrete choice theory" Adivsors: Prof. Alex A. OPOKU and Prof. Samuel GYAMFI FGPA: 3.85/4
09/2013 - 08/2017	Bachelor of Science in MATHEMATICS **University of Energy and Natural Resources**, Ghana Thesis: "Mathematical Modelling of Decision Making: The case of educational and employment choices in Ghana" Advisors: Prof. Alex A. OPOKU, Dr. Charles KWOFIE
10/2009 - 05/2013	Bompeh Senior High Technical School, Takoradi, Ghana **West Africa Secondary School Certificate Examination** GENERAL SCIENCE: MATHEMATICS, PHYSICS, CHEMISTRY AND BIOLOGY

PUBLICATIONS

1. **G. Osabutey**. Phase properties of the mean-field Ising model with three-spin interaction. Available at SSRN: http://dx.doi.org/10.2139/ssrn.4469835 (Under review: Journal of Mathematical Physics)

2. P. Contucci, E. Mingione, **G. Osabutey**. Limit theorems for the cubic mean-field Ising model, doi.org/10.48550/arXiv.2303.14578. (To appear: Annales Henri Poincaré)

3. P. Contucci, **G. Osabutey**, C. Vernia. Inverse problem beyond two-body interaction: The cubic mean-field Ising model, Phys. Rev. E, 107, 054124, 2023.

4. P. Contucci, J. Kertész and **G. Osabutey**, Human-AI ecosystem with abrupt changes as a function of the composition, PLoS ONE 17(5): e0267310, 2022.

5. **G. Osabutey**, A. A. Opoku and S. Gyamfi. A statistical mechanics approach to energy conservation behaviour, Journal of Applied Mathematics, Volume 2020, Article ID 7384053, 2020.

6. A. A. Opoku, **G. Osabutey** and C. Kwofie, Parameter Evaluation for a statistical mechanical model for binary choice with social interaction, Journal of Probability and Statistics Volume 2019, Article ID 3435626, 2019.

7. A. A. Opoku and **G. Osabutey**, Multipopulation Spin Models: A View from Large Deviations Theoretic Window, Journal of Mathematics, vol. 2018, Article ID 9417547, 2018.

Research Interest

Statistical mechanics and applications to complex systems, probability theory, large deviations theory, mean-field O(N) models, stochastic block model, Heider's balance theory, mixture models, stochastic processes, inverse problems, optimisation, machine learning

Work In Progress

(With E. Pulvirenti, W. Ruszel, M. Slowik) Fluctuations of the magnetization in the Ising mean-field block model with three-spins.

(With G. Page, R. Robertson) Bayesian approach to the inverse Ising problem with three-body interactions.

(With G. Page, R. Robertson) An agent-based interacting model of the financial market.

(With F. Camilli, P. Contucci, E. Mingione) Limit theorems of the generalised multi-species Curie-Weiss model

Professional Experience

01 Feb. '24 - 31 Jan. 2025	Postdoctoral Research Fellow - University of Bologna Department of Mathematics
19 Sept. - 28 Oct. 2022	Teaching Tutor - University of Bologna, Department of Economics 30hrs Crash course in mathematics - Tutorials in Mathematics
Jan. 2019 - Jan. 2021	Mathematics Teacher at Odomaseman Senior High School Department of Mathematics Taught final year students mathematics and prepare them for their WAEC exam
Sept. 2017 - Aug. 2018	National Service – Teaching Assistant University of Energy and Natural Resources, Ghana Department of Mathematics and Statistics Taught undergraduate tutorial classes in Probability, Measure Theory, Topology, Stochastic Processes and Research and Review of Mathematics.

Academic Visits

10 Sept. - 10 Oct. 2023	Visiting PhD. Candidate - Utrecht University, Utrecht, The Netherlands. Centre for Complex Systems Studies and Department of Mathematics

MAY 2023 - AUG. 2023	Visiting PhD. Candidate - Brigham Young University, Provo, Utah, USA. DEPARTMENT OF STATISTICS

CONFERENCES, SCHOOLS AND WORKSHOPS ATTENDED

17 - 19 JAN. 2024: Mathematics for Artificial Intelligence and Machine learning, Bocconi University, Milano, Italy.

6 OCT 2023: Mark Kac National Seminar, Utrecht, The Netherlands. (Talk: Fluctuations of the k-block mean-field Ising model with pairwise interaction)

5 OCT 2023: Young Complexity Researchers', Centre for Complex Systems Studies, Utrecht University, Utrecht, The Netherlands. (Talk: Beyond two-body interaction: the cubic mean-field Ising model)

27 SEPT 2023: Eindhoven SPOR Seminar, Eindhoven, The Netherlands. (Talk: Fluctuations of the k-block mean-field Ising model with pairwise interaction)

28 AUG - 8 SEPT 2023: From Coin Tossing to the Parisi Theory of Complexity, Scuola Matematica Interuniversitaria, Cortona, Arezzo, Italy.

21 - 22 JUNE 2023: 45th Annual Summer Institute of Applied Statistics, Brigham Young University, Provo, USA

17 - 21 APRIL 2023: Inequality Across Scales, Space, Time and Domains, The Abdus Salam International Centre for Theoretical Physics, Trieste, Italy.

10 - 11 OCT. 2022: New Methods and Data for Migration Studies, Paris School of Economics, Paris, France. (Talk: *The effect of interaction and composition on resident-immigrant cultural contact*)

15 - 19 AUG. 2022: Applied and Computational Mathematics Emphasis, Brigham Young University, Provo, USA. (Talk: *Beyond two-body interaction: the cubic mean-field Ising model*)

31 JAN. - 25 FEB. 2022: PhD Winter School on Advanced methods for mathematical image analysis, **MIVA**, Italy.

06 SEPT. - 15 SEPT. 2021: Summer School of Mathematical Physics, GRUPPO NAZIONALE PER LA FISICA MATEMATICA, GNFM, Ravelo, Italy (I gave a seminar)

14 SEPT. - 17 SEPT. 2020: DMV Annual Meeting, AIMS-TU Chemnitz Minisymposium on Applied Mathematics, Chemnitz University of Technology, Germany (Paper was presented)

26 NOV. - 01 DEC. 2018: Computational Mixed-Integer Programming with AMPL, Brandenburg University of Technology, Cottbus, Germany.

27 AUG. - 01 SEP. 2018: Computational Mixed-Integer Programming with AMPL, African Institute for Mathematical Sciences, Cape Coast, Ghana.

27 NOV. - 01 DEC. 2017: Scientific Computing and Industrial Modelling, National Institute for Mathematical Sciences, KNUST, Ghana (Paper was presented).

Achievements, Scholarships and Awards

26 Jan. 2024	PRIN Research Fellowship grant, Department of Mathematics, University of Bologna, Italy. Boltzmann Machines beyond the independent identically distributed Paradigm: a Mathematical Physics Approach. (2024-2025).
21 July 2023	Swaantje Mondt research visit grant, Center for Complex Systems Studies, Utrecht University, Awarded for the year 2023-2024.
5 May 2023	Marco Polo grant from the University of Bologna for research visit to the Brigham Young University, Provo, USA.
Nov. 2020	3-years PhD in Mathematics scholarship from the Department of Mathematics, University of Bologna, Italy.
13 Sept. 2018	DAAD-AIMS Ghana PeStO (Perspectives in Stochastic Optimization and Application) grant to attend a winter school at Brandenburg University of Technology in Cottbus, Germany on Computational Mixed-Integer Programming with AMPL.
3 Sept. 2018	I placed first in an exam on Computational Mixed-Integer Programming with AMPL organised by the African Institute of Mathematical Science, Ghana with Prof. Dr. Armin Fügenschuh as the facilitator and examiner from Brandenburg University of Technology in Cottbus, Germany.
1 March 2018	Ghana National Petroleum Corporation Scholarship, to pursue a master's degree in Applied Mathematics at the University of Energy and Natural Resources.

Computer Skills

Basic Knowledge	Java, C, Access
Intermediate Knowledge	Python, Matlab, R, ampl, Mathematica, Julia, LaTeX

Extracurricular Activity

Nov. 2017 - Date	CEO & Data Analyst at GT Educational and Research Consult, Sunyani, Ghana.
Nov. 2015 - 2021	Animal farming, Sunyani Ghana
2013 - Mar. 2021	Branch Clerk, Fiapre Branch The Church of Jesus Christ of Latter-Day Saint Sunyani Ghana District, Ghana
May 2016 - Aug. 2016	Student Internship, Records Department Seventh Day-Adventist Hospital, Bono Region 1. Analyse reported medical cases to identify trends or seasonal cases. 2. Requesting services to be offered to patients using the Hospital Administration and Management software.

2015 - Mar. 2021	Self-Reliance Facilitator, Sunyani Ghana District The Church of Jesus Christ of Latter-Day Saint Sunyani, Ghana

Languages

English:	Fluent
French:	Basic Knowledge
Italian:	Basic Knowledge

Interests and Hobbies

Movies, Jogging, Farming, Football, Travelling

References

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Prof. Cecilia Vernia
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Università di Modena e Reggio Emilia, Italy
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