Paidamoyo Chapfuwa

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Education

Duke University — Durham, NC
Ph.D. in Electrical & Computer Engineering — Aug 2016–May 2021

- Dissertation: *Probabilistic Time-to-Event Modeling Approaches for Risk Profiling*
- Committee: Drs. Lawrence Carin (advisor), Ricardo Henao (co-advisor), Henry Pfister, Michael J. Pencina, and Galen Reeves

Duke University — Durham, NC
M.S. in Electrical & Computer Engineering, GPA: 3.9/4.0 — Aug 2016–Dec 2018

- Project: *Learning to hash with neural autoencoders*
- Selected Coursework: Bayesian and Modern Statistics, Machine Learning, Advanced Machine Learning, Pattern Classification and Recognition Technology, Information Theory, Textual Data Acquisition & Analysis, Programming, Data Structures & Algorithms in C++, Cloud Computing

Duke University — Durham, NC
B.S.E in Electrical & Computer Engineering, GPA: 3.7/4.0 — Aug 2009–May 2013

- Thesis: *Radar Signal Processing for Stand-off life sign Monitoring*, Advisor: Dr. Jeffrey L. Krolik
- Certificate: Markets & Management Studies
- Graduation with Distinction In Electrical & Computer Engineering, Eta Kappa Nu

Publications

1. **P. Chapfuwa**, C. Tao, C. Li, C. Page, B. Goldstein, L. Carin, R. Henao, "Adversarial Time-to-Event Modeling", *Int. Conf. Machine Learning (ICML), 2018*
2. D. Shen, Q. Su, **P. Chapfuwa**, W. Wang, G. Wang, L. Carin, R. Henao, "NASH: Toward End-to-End Neural Architecture for Generative Semantic Hashing", *Assoc. for Computational Linguistics (ACL), 2018*
3. **P. Chapfuwa**, C. Li, N. Mehta, L. Carin, R. Henao, "Survival Cluster Analysis", *ACM Conf. on Health, Inference, and Learning (ACM CHIL), 2020*
4. **P. Chapfuwa**, C. Tao, C. Li, I. Khan, K. Chandross, M. J. Pencina, L. Carin, R. Henao, "Calibration and Uncertainty in Neural Time-to-Event Modeling", *IEEE Transactions on Neural Networks and Learning Systems (IEEE TNNLS), 2020*
5. **P. Chapfuwa**, S. Assaad, S. Zeng, M. J. Pencina, L. Carin, and R. Henao, "Enabling Counterfactual Survival Analysis with Balanced Representations", *ACM Conf. on Health, Inference, and Learning (ACM CHIL), 2021*
6. **P. Chapfuwa**, S. Rose, L. Carin, E. Meeds, R. Henao, "Capturing Actionable Dynamics with Structured Latent Ordinary Differential Equations", *Conf. on Uncertainty in Artificial Intelligence (UAI) 2022*
7. Y. Isik, **P. Chapfuwa**, C. Davis, R. Henao, "Hawkes Process with Flexible Triggering Kernels", *Machine Learning for Healthcare (MLHC) 2023*
8. M. F. Pradier, N. Prasad*, **P. Chapfuwa***, S. Ghalebikesabi, M. Ilse, S. Woodhouse, R. Elyanow, J. Zazo, J. Gonzalez, J. Greissl, E. Meeds, "AIRIVA: A Deep Generative Model of Adaptive Immune Repertoires", *Machine Learning for Healthcare (MLHC) 2023*
9. **P. Chapfuwa**, I Demirel, L Pisani, J Zazo, E Portugaly, J Zahid, J Greissl, "Scalable Universal T-Cell Receptor Embeddings from Adaptive Immune Repertoires", *Int. Conf. Learning Representations (ICLR), 2025*

Selected Work Experience

Microsoft Research Redmond, WA, USA
Senior Researcher June 2022-Present

- Conducting research on theoretically grounded deep representation learning methods for adaptive immune responses and immune cells
- Member of the Health Futures research group

Stanford University Stanford, CA
Postdoctoral Research Fellow, Medicine - Primary Care Outcomes Research June 2021-June 2022

- Conducting research on causal inference and survival analysis methods for health care
- Mentored by Dr. Sherri Rose

Microsoft Research AI Redmond, WA, USA
Research Intern Summer 2020

- Characterizing T-cell receptor and serology temporal dynamics in COVID-19 and Lyme patients
- Mentored by Drs. Julia Greissl and Ted Meeds on the Immunomics Team

Microsoft Research AI Redmond, WA, USA
Research Intern Summer 2019

- Adaptive variational autoencoder for clustered textual representation
- Mentored by Dr. Chunyuan Li on the Deep Learning and Natural Language Processing Team

Savannah Informatics Nairobi, Kenya
Senior Software Engineer Summer 2016

- Developed an authentication Electron desktop application based on fingerprint and electronic card readers
- Mentored junior software developers in Agile software development practices, *i.e.*, TDD, pairing, continuous delivery, and continuous integration

ThoughtWorks South Africa, Brazil, India, USA
Software Consultant Developer Aug 2013–April 2016

- Developed (*i*) SpringMVC services, (*ii*) Java features, and (*iii*) platform event-driven microservices
- Projects: (*a*) Online banking application serving 15 million customers and (*b*) global retail analytics

Engineering World Health Arusha, Tanzania
On the Ground Coordinator Summer 2013

- Taught and supervised 3-hour lab sessions on electronics and medical equipments (repair and maintenance)

Teaching

- **Graduate Teaching Assistant** Duke University Fall 2020
  Probability for Electrical and Computer Engineers (ECE: 555)
- **Graduate Teaching Assistant** Duke University Spring 2018/2019
  Pattern Classification and Recognition (ECE: 681)
- **Graduate Teaching Assistant** Duke University Fall 2017
  Random Signals and Noise (ECE: 581)
- **Undergraduate Teaching Assistant** Duke University Spring 2013
  Fundamentals of Digital Signal Processing (ECE: 381)
- **Undergraduate Laboratory Teaching Assistant** Duke University Fall 2012
  Introduction to Signals and Systems (ECE: 280L)

Selected Scholarships and Awards

- Rising Star in AI for Social Good *Harvard CRCS* 2021
- FOCUS Fellow *Georgia Tech* 2020
- GHC 20 Student Scholarship *AnitaB.org* 2020
- Best Paper Honorable Mentions *Association for Computational Linguistics* 2018
- Graduation with Distinction In Electrical & Computer Engineering *Duke University* 2013
- Eta Kappa Nu *IEEE* 2012
- Pratt Research Fellow *Duke University* 2012
- Duke University Scholar *Duke University* 2009
- Pestalozzi Scholar *Pestalozzi International Village, East Sussex, England* 2007
- Joshua Mqabuko Nkomo Scholar *Econet Wireless, Zimbabwe* 2007
- Zimbabwe Junior Chess Champion *Zimbabwe Schools Chess Association* 2007

Invited Talks

- "Survival Analysis meets Counterfactual Inference" *Microsoft Research AI* 2020
- "Bringing modern machine learning to survival analysis" *Data Science Consortium, University of Michigan* 2020
- "Bringing modern machine learning to survival analysis" *Doctorial Symposium, ACM-CHIL* 2020
- "Generative Time-to-Event Modeling for Risk Profiling" *Biostatistics Seminar at Boston University* 2021
- "Counterfactual Survival Analysis with Balanced Representations" *Harvard CRCS Rising Stars: Health* 2021
- "Beyond ranking: Building robust time-to-event models" *ELLIS Human-Centric Machine Learning* 2021
- "Enabling clinical decision making with causal survival analysis" *Microsoft Research AI* 2021
- "Enabling clinical decision making with causal survival analysis" *IE Seminar at Purdue University* 2022
- "Tackling Confounding and Censoring Biases in Counterfactual Survival Analysis" *AAAI Symposium* 2023

Skills

- **Reviewer:** NeurIPS (2019-2024), ICML (2020-2024), AISTATS (2024-2025), ACL (2020), AAAI (2020-2024), ICLR (2020-2025), EMNLP (2020), Medical Image Analysis (2021), IEEE TPAMI (2022), JRSSB (2022)
- **Programming:** TensorFlow, Pytorch, Git, Java, Python, JavaScript, R, MATLAB, C++, AngularJS, SpringMVC

Languages

- **Languages:** Fluent in English, Ndebele and Shona
- **Languages:** Conversational Zulu, Swahili, Spanish and Portuguese

Prepared in January 2025