Mike Nsubuga

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Website: https://mikensubuga.github.io/

EDUCATION

2023 – 2027 **University of Bristol**, UK **Ph.D.**
Research: Using machine learning to trace gastrointestinal disease outbreaks and antimicrobial resistance. Supported by **MRC Ph.D. Studentship**
Supervisors: Sion Bayliss, Lauren Cowley, Andrew Dowsey, and Kristen Reyher

2020 – 2022 **Makerere University**, Uganda **M.Sc. in Bioinformatics (First Class Honors)**
Dissertation Title: A machine learning approach to predict *E. coli* antibacterial resistance using whole-genome sequencing data in Uganda. Supported by **NIH-Fogarty EANBIT M.Sc. Fellowship**
Supervisors: Daudi Jjingo and Gerald Mboowa

2016 – 2019 **Makerere University**, Uganda **B.Sc. in Information Technology (First Class Honors)**

RESEARCH EXPERIENCE

2023 – PRESENT **Jean Golding Institute of Data Science,** University of Bristol, UK
Ask-JGI Research Data Scientist

2023 – 2023 **Division of Human Genetics,** University of Cape Town, South Africa
Research Fellow, Sickle in Africa Consortium

2022 – 2023 **Department of Entomology,** Uganda Virus Research Institute, Uganda
Research Fellow, Open Data Science Platform - eLwazi

2020 – 2023 **Infectious Diseases Institute, African Center of Excellence in Bioinformatics,** Makerere University, Uganda
Research Fellow & Bioinformatics Trainee

AWARDS, HONORS AND FELLOWSHIPS

2024 – **Travel Award:** Awarded a travel grant by the Medical Research Council (MRC) to attend the 2024 Computational Genomics Summer Institute at University of California, Los Angeles

2023 – **Ph.D. Studentship:** Awarded a studentship from the Medical Research Council (MRC) to undertake a 4-year Ph.D. at University of Bristol.

2022 – **Travel Award:** Awarded a travel scholarship by Open Science Grid funded by National Science Foundation (NSF) to attend OSG school at the University of Wisconsin-Madison.

2021 – **M.Sc. Fellowship:** Awarded a Fellowship under EANBIT project from the National Institutes of Health (NIH) Fogarty to undertake a 2-year Master's degree program in Bioinformatics at Makerere.

2020 – **Dissertation Award**: Graduated top of undergraduate class, 2019, with a CGPA 4.71/5.0

PUBLICATIONS

Peer-Reviewed Publications

Nsubuga, M., Galiwango, R., Jjingo, D., & Mboowa, G. (2024). Generalizability of machine learning in predicting antimicrobial resistance in *E. coli*: A multi-country case study in Africa. *BMC Genomics*, *25*(1), 287. https://doi.org/10.1186/s12864-024-10214-4

Mboowa, G., Kakooza, F., Egesa, M., Tukwasibwe, S., Kanyerezi, S., Sserwadda, I., Kidenya, B. R., Kabahita, J. M., Namaganda, M. M., **Nsubuga, M.,** Nabisubi, P., Ayitewala, A., Kebirungi, G., Nakafu, E., & Akwii, N. P. (2024). The rise of pathogen genomics in Africa (13:468). F1000Research. https://doi.org/10.12688/f1000research.147114.1

Please, H., Narang, K., Bolton, W., **Nsubuga, M.,** Luweesi, H., Richards, N. B., Dalton, J., Tendo, C., Khan, M., Jjingo, D., Bhutta, M. F., Petrakaki, D., & Dhanda, J. (2024). Virtual reality technology for surgical learning: Qualitative outcomes of the first virtual reality training course for emergency and essential surgery delivered by a UK–Uganda partnership. *BMJ Open Quality*, *13*(1). https://doi.org/10.1136/bmjoq-2023-002477

Buyego, P., Katwesigye, E., Kebirungi, G., **Nsubuga, M.,** Nakyejwe, S., Cruz, P., McCarthy, M. C., Hurt, D., Kambugu, A., Arinaitwe, J. W., Ssekabira, U., & Jjingo, D. (2022). Feasibility of virtual reality based training for optimising COVID-19 case handling in Uganda. *BMC Medical Education*, *22*(1), 274. https://doi.org/10.1186/s12909-022-03294-x

Nsubuga, M., Mutegeki, H., Jjingo, D. *et al.* The Ugandan sickle Pan-African research consortium registry: design, development, and lessons. *BMC Med Inform Decis Mak* **24**, 212 (2024). https://doi.org/10.1186/s12911-024-02618-9

Other Scholarly Works (Posters)

Nsubuga M, Yi Ling Tam, Malaka de Silva, James Hall, Lauren Cowley, Claire Jenkins, Kate Baker, Sion Bayliss. (2024). Mapping the distribution of AMR in *Shigella sonnei*. NIHR HPRU in Gastrointestinal Infections, Birmingham [Poster]. http://hprugi.nihr.ac.uk/media/f1uc4ayb/mike-nsubuga.pdf

Nsubuga, M. (2023). *A machine learning approach to predict E. coli antibacterial resistance using whole-genome sequencing data* [Thesis, Makerere University]. http://makir.mak.ac.ug/handle/10570/13162

INVITED TALKS

20/03/2024 –	Utilising Machine Learning for tracing gastrointestinal outbreaks and antimicrobial resistance, MRC GW4 DTP, UK
23/08/2023 –	Empowering low middle income countries against antimicrobial resistance with AI and Whole-Genome Sequencing, AMR Force, University of Bristol
23/07/2022 –	Ugandan AI COVID-19 chatbot for automated and personalized symptom assessment in Luganda & English. University of Wisconsin-Madison, Open Science Grid School, US
04/03/2022 –	End to end AI and data systems for targeted surveillance and management of COVID-19 and future pandemics affecting Uganda (COAST), Uganda
08/04/2022 –	Optimizing the SickleInAfrica Registry Data Collection Workflow Using Site-specific Clinical Processes, Sickle in Africa consortium meeting, South Africa
26/04/2022 –	Virtual Reality in Medicine and Surgery Conference (VRiMs), Uganda

TEACHING EXPERIENCE

2024 –	**School of Engineering Mathematics & Technology,** University of Bristol Teaching assistant – EMATM0047, Data Science Project Teaching assistant – EMATM0067, Introduction to AI & Text Analytics Teaching assistant – EMATM0048, Software Development: Programming & Algorithms
2021 – 2022	H3ABioNet and Wellcome Connecting Science Teaching assistant – Next Generation Sequencing short course
2018 – 2019	**Department of Computer Science,** Makerere University C & Java programming tutorial assistant

WORK EXPERIENCE

2020 – 2022	**Supporting African Math Initiatives (SAMI),** U.K Software Developer (Volunteer to SAMI Math Charity)
2020 – 2020	**Statistics for Sustainable Development (STATS4SD),** Reading, UK Programming Intern

MENTORSHIP

Rebecca Nakitandwe, MSc in Health Informatics, Makerere University, 2023 – 2025
Henry Mutegeki, MSc in Computer Science (Google DeepMind Scholar), Makerere University 2022 – 2024
Sandra Babirye, MSc in Bioinformatics (MakDarta Fellow), Makerere University, 2022 – 2024
Florence Nakabiri, MSc in Bioinformatics, Makerere University, 2022 – 2024

SERVICE, OUTREACH AND LEADERSHIP

Work done under Supporting African Maths Initiatives (SAMI), a UK-based charity dedicated to improving access to and quality of mathematics education in Africa.

2020 – 2020	**Software Developer** SAMI Math Club App (A collection of mathematical problems and puzzles to support mathematical thinking, problem solving and love of mathematics, used in 5 African countries during Maths Camp) – https://mathsclub.samicharity.co.uk/
2020 – 2021	**Lead Software Developer** Card Deck – A web and mobile application together with a printed card deck featuring unique activities, engaging participants in games, puzzles or fun mathematical facts – https://cards.virtualmathscamp.com/
2020 – 2021	**Junior Developer** UNICEF Parenting for Lifelong Health – An open source and evidence-based parenting app to support parents and caregivers during the COVID-19 pandemic and beyond

Work done under PICSA, a method developed by researchers at University of Reading, UK that combines climate data with African farmers' insights to enhance informed agricultural decision-making through participatory methods.

2022 – 2023	**Technical Lead**

Conducted field digital training and workshops of approaches for farmers in Malawi and Zambia on implementation of the PICSA approach - https://picsa.app/

OTHER PREVIOUS PROJECTS

2023 – 2023 **Web Developer**

AI for Health Equity: Transforming Pandemic Preparedness in Uganda (HEAL) using Large Language Models– Funded by Bill & Melinda Gates Foundation - https://heal.aceuganda.org/

2021 – 2023 **Lead Software Developer**

An Epilepsy Self-Management and Resilience Technical application for Adolescents and their community – Funded by Epilepsy Foundation in collaboration with Duke University https://github.com/aceuganda/epilepsy-smart-app

2021 – 2022 **Junior Data Scientist**

AI-based COVID-19 chatbot for Uganda – Funded by International Development Research Centre (IDRC)

2021 – 2025 **Lead Developer**

Sickle Pan- African Research Consortium (SPARCO) Uganda: Strengthening Capacity for Clinical Care, Research and Training in Sickle Cell Disease– Funded by NIH/NHLBI in collaboration with UCT