

Mbithe Nzomo

mbithe.nzomo@gmail.com · [mbithenzomo.github.io](https://github.com/mbithenzomo) · [linkedin.com/in/mbithenzomo/](https://www.linkedin.com/in/mbithenzomo/)

Research summary: My PhD explores the integration of data-driven and knowledge-driven AI in an agent-based architecture for personal health and wellness monitoring using wearable sensors. I look at two use cases: atrial fibrillation and stress.

Research interests: machine learning, ontologies, neuro-symbolic AI, intelligent agents, sensor data, health monitoring.

Skills (languages/libraries/frameworks): Python, scikit-learn, Pandas, NumPy, Matplotlib, PyTorch, Protégé, OWL, SWRL, SPARQL.

EDUCATION

- University of Cape Town**, Cape Town, South Africa 2021 - Present
PhD, Computer Science
Supervisor: Deshen Moodley. Title: "An Agent-Based Framework for Sensor-Based Health Monitoring Towards Precision Health"
- University of Manchester**, Manchester, United Kingdom 2018 - 2019
MSc, Advanced Computer Science (Distinction)
Supervisor: Angelo Cangelosi. Title: "Hello, Goodbye : Training Social Robots to Manage Interactions with Humans"
- Strathmore University**, Nairobi, Kenya 2012 - 2016
BSc, Informatics (2:1)

WORK EXPERIENCE

- Research Assistant (part-time)** 2023 - Present
Adaptive and Cognitive Systems Lab at the Centre for Artificial Intelligence Research (CAIR)
Cape Town, South Africa
 - Building a generalisable platform and workflow for deep learning projects within the lab.
 - Consolidating and documenting codebases, datasets, and other research outputs.
 - Developing a set of tutorials for technologies, libraries, and frameworks used in the lab.
- Teaching Assistant, Data Science & AI (part-time)** 2021 - 2022
iXperience Remote
 - Contributed to curriculum development, assisted in delivering lectures, and held office hours.
 - Managed student internship projects with South Africa-based companies.
- Senior Technology Consultant** 2019 - 2021
EY Nairobi, Kenya
 - Executed end-to-end client engagements, including research, analysis, proposal development and implementation of emerging technologies in different organisations across a variety of sectors.
 - Led data analytics team in client engagement involving financial data from the 2018/2019 financial year collected from 220 government facilities across 25 counties in Kenya.
- Software Engineer** 2016 - 2018
Andela Nairobi, Kenya
 - Built web apps and RESTful APIs. Primarily focused on back-end development using Python, including Flask and Django.
 - Guided and mentored more than 50 developers by serving as a Technical Team Lead for simulated projects, as well as a Learning Facilitator for programming bootcamps.
 - Engaged in remote and culturally diverse teams with team members distributed across Africa and the US.
 - Invited to speak at multiple technology conferences, including the 2017 Propelify Innovation Festival in Hoboken, NJ, and the 2017 ASU+GSV Summit in Salt Lake City, UT.

FELLOWSHIPS AND SCHOLARSHIPS

- Mawazo Fellowship**, Mawazo Institute 2023
- Generation Google Scholarship (Europe, Middle East, and Africa)**, Google 2022
- Hasso Plattner Institute (HPI) Fellowship**, HPI Research School at UCT 2021
- CAIR Scholarship**, Centre for Artificial Intelligence Research, South Africa 2021
- Grace Hopper Celebration Student Scholarship**, AnitaB.org 2019
- Chevening Scholarship**, Foreign, Commonwealth and Development Office, United Kingdom 2018

PUBLICATIONS AND PREPRINTS

Nzomo, M.; Moodley, D. 2023. Semantic Technologies in Sensor-Based Personal Health Monitoring Systems: A Systematic Mapping Study. Under review at the Semantic Web Journal. Preprint available: doi.org/10.48550/arXiv.2306.04335

Wanyana, T.; **Nzomo, M.;** Price, C. and Moodley, D. 2023. A Personal Health Agent for Decision Support in Arrhythmia Diagnosis. In Information and Communication Technologies for Ageing Well and e-Health. ICT4AWE ICT4AWE 2021 2022. Communications in Computer and Information Science, vol 1856. doi.org/10.1007/978-3-031-37496-8_20

Wanyana, T.; **Nzomo, M.;** Price, C. and Moodley, D. 2022. Combining Machine Learning and Bayesian Networks for ECG Interpretation and Explanation. In Proceedings of the 8th International Conference on Information and Communication Technologies for Ageing Well and e-Health (ICT4AWE 2022), pages 81-92. doi.org/10.5220/0011046100003188

SERVICE, VOLUNTEERING, AND OUTREACH

Event Fund Selection Committee member - Code for Science and Society	Incoming, Oct 2023
Short paper reviewer - Deep Learning Indaba	Aug - Sep 2023
Data Science track mentor - KamiLimu	Oct 2022 - May 2023
Professional mentor; scholarship application mentor - KamiLimu	Mar 2020 - May 2023
Application reviewer - Deep Learning Indaba	Mar - Apr 2023
Responsible Computer Science Challenge Judge - Mozilla Foundation	Jan - Mar 2023
Paper reviewer (Shadow PC) - ACM Conference on Computing and Sustainable Societies (COMPASS)	Apr - Jun 2021
Technical writer (programming tutorials) - RealPython.org	May - Sep 2018
Technical writer (programming tutorials) - Scotch.io (since acquired by Digital Ocean)	Oct 2016 - Jan 2017
Co-organiser and coach - Django Girls (Nairobi, Mombasa, and Manchester)	May 2016 - Feb 2019

SELECTED CONFERENCES, WORKSHOPS, AND EVENTS

International Joint Conference on Artificial Intelligence (IJCAI 2023)	Aug 2023
<i>Poster presentation, Africa Spotlight Poster Session</i>	Macau, S.A.R.
Code for Science and Society (CS&S) Co-Design Workshop	May 2023
<i>Participant, Climate-Sensitive Infectious Disease Open Source Software Community of Practice</i>	Cape Town, South Africa
Hasso Plattner Institute (HPI) Research Symposium 2023	Apr 2023
<i>Poster and oral presentation</i>	Potsdam, Germany
Southern African Conference for Artificial Intelligence Research (SACAIR 2022)	Dec 2022
<i>Unconference presentation</i>	Stellenbosch, South Africa
Deep Learning Indaba 2022	Aug 2022
<i>Poster presentation; selected in a competitive application process</i>	Tunis, Tunisia
International Conference on ICT for Ageing Well and e-Health (ICT4AWE 2022)	Feb 2022
<i>Paper presentation</i>	Virtual
Oxford Machine Learning Summer School (OxML 2021)	Aug 2021
<i>Participant; selected in a competitive application process</i>	Virtual
Grace Hopper Celebration (GHC) 2019	Oct 2019
<i>Participant; awarded the competitive GHC student scholarship to attend</i>	Orlando, Florida

ACADEMIC TEACHING AND SUPERVISION

Teaching Assistant	2022 - Present
<i>Department of Computer Science, University of Cape Town</i>	Cape Town, South Africa
I am/have been a Teaching Assistant for the following first-year Python programming courses: CSC1015F, CSC1017F, CSC1019F, CSC1010H, and CSC1011H.	

Honours Project Co-Supervisor	2022
<i>Department of Computer Science, University of Cape Town</i>	Cape Town, South Africa
I co-supervised a team of honours (fourth-year) students as part of the year-long CSC4002W (Computer Science Honours Project) course. The project was titled "Deep Learning Algorithms in the Detection of Cardiovascular Diseases Using Electrocardiogram Data".	