

Ashery Mbilinyi

Education

2017-2023 **Ph.D. Computer Science**, *University of Basel*, Basel, **Switzerland**

My research spanned the fields of Machine Learning, Computer Vision, and Information Retrieval. I focused on pioneering methods to enhance medical image retrieval systems, aiming to transform them into effective computer-aided diagnosis tools for healthcare professionals. I published my findings in top venues within Applied Computing and Bioinformatics, such as SIGAPP, IEEE BIBM, and IEEE-EMBS BHI.

2015-2017 **M.Sc. Information Science**, *JAIST*, Nomi, **Japan**

Researched Intelligent Tutoring Systems at the Japan Advanced Institute of Science and Technology (JAIST). I developed a theoretical framework to tackle the "cold-start" problem and implemented a web-based system to provide personalized learning recommendations to students. My research culminated in the presentation of my work at three international conferences, contributing to the field of educational technology.

2007-2013 **B.Eng. Computer Engineering**, *Dar es Salaam Institute of Technology (DIT)*, **Tanzania**

Graduated 2nd among 86 students in the entire Computer Engineering Department. As part of my final year project, I designed and developed an online learning management system using PHP and MySQL, showcasing my skills in software development and database management.

Relevant Experience

Research

June 2023–Present **Postdoctoral Researcher**, *The University of British Columbia*, Vancouver, **Canada**

- Working under Prof. Roger Tam, School of Biomedical Engineering, on multi-modal machine learning approaches tailored to enhance cardiovascular disease intervention and effective management.

2020–2023 **Research Assistant**, *University of Basel*, Basel, Switzerland

- Conducted research aimed at advancing general-purpose medical image retrieval systems, positioning them as potent tools for computer-aided diagnostics.

Oct 2014–Mar 2015 **Research Assistant**, *Distance Learning Centre at JAIST*, Nomi, Japan

- Worked at the Centre for Innovative Distance Education and Research (Distance Learning Centre), where I analyzed data related to classroom activities recorded during lecture sessions and maintained the campus's e-learning infrastructure.

Teaching

Apr–Aug 2017 **Assistant Lecturer**, *DIT*, Dar es Salaam, Tanzania

- Created course materials and taught an Object Oriented Programming in Java course to 166 undergraduate students.

Apr 2013–Oct 2013 **Computer Lab. Technician**, *DIT*, Dar es Salaam, Tanzania

- Maintained computer equipment and peripherals in the lab and guided students during practical sessions.

2008, 2011 **Physics Teacher**, *Vwawa Secondary School*, Mbeya, Tanzania

- Volunteered to teach Physics at a local school that faced a significant challenge with only one teacher for more than 400 students.

Industry

Sept. 2015 **Business Analyst Intern**, *Ricoh Company Ltd*, Tokyo, Japan

- Worked with the emerging markets team to analyze data and formulate strategies for emerging markets.

Nov. 2013–Sept. 2014 **Software Developer**, *India-Tanzania Centre of Excellence in ICT*, Dar es Salaam, Tanzania

- Led a project to develop a telemedicine application that facilitates the connection between doctors from referral hospitals and patients from underserved health centers.

Publications

- Abdul-Hakeem Omotayo, **Ashery Mbilinyi**, Lukman Ismaila, Houcemeddine Turki, Mahmoud Abdien, Karim Gamal, Idriss Tondji, Yvan Pimi, Naome A. Etori, Marwa Matar, Gbetondji Dovonon, Daniel Ajisafe, Mennatullah Siam, "The State of Computer Vision Research in Africa," *Journal of Artificial Intelligence Research (To Appear)* (Preprint—<https://arxiv.org/abs/2401.11617>)
- **Ashery Mbilinyi**, Heiko Schuldt, "CheReS: A Deep Learning-based Multi-faceted System for Similarity Search of Chest X-rays," *In Proceedings of the 37th ACM/SIGAPP Symposium On Applied Computing (SAC 2022)*, Brno, Czech Republic, 2022 (Acceptance rate = 22.29%)
- **Ashery Mbilinyi**, Heiko Schuldt, "Retrieving Chest X-rays for Differential Diagnosis: A Deep Metric Learning Approach," *In Proceedings of the 2021 IEEE EMBS International Conference on Biomedical and Health Informatics (BHI)*, Athens, Greece, 2021 (Acceptance rate = 32.7%)
- **Ashery Mbilinyi**, Heiko Schuldt, "Cross-Modality Medical Image Retrieval with Deep Features," *In Proceedings of the 2020 IEEE International Conference on Bioinformatics and Biomedicine (BIBM)*, Seoul, South Korea, 2020 (Acceptance rate = 19.4%)
- **Ashery Mbilinyi**, Heiko Schuldt, Nicolas Maire, Thomas Smith, "Analysis of Malaria Risk based on Housing Conditions in Sub-Saharan Africa," *In Proceedings of the 2018 ACM International Conference on Digital Health (DH)*, Lyon, France, 2018
- **Ashery Mbilinyi**, Shinobu Hasegawa, Akihiro Kashihara, "Estimation and Adaptation Method for Students Learning Styles on Web-based Learning," *In Proceedings of the 9th International Conference on Mobile, Hybrid, and Online Learning (eLmL)*, Nice, France, 2017
- **Ashery Mbilinyi**, Shinobu Hasegawa, Akihiro Kashihara, "Design for Adaptive User Interface for Modeling Students Learning Styles," *In Proceedings of the 18th International Conference on Human-Computer Interaction (HCI)*, Toronto, Canada, 2016
- **Ashery Mbilinyi**, Shinobu Hasegawa, "Design for Adaptive Web-based Learning System based on Users Learning Styles," *In Proceedings of the 11th International Conference on Knowledge Management (ICKM)*, Osaka, Japan, 2015

Research Projects

- June 2023 **Detection of Myocardial Scarring from ECGs and Cardiac MRIs**
 - Working with the UBC Division of Cardiology, Department of Radiology, and Department of Emergency Medicine on multi-modal machine learning methods to predict myocardial scarring using ECGs and Cardiac MRIs.
- 2021-2022 **Multimodal Representation Learning for Case-Based Medical Image Retrieval**
 - Developed a representation learning method that seamlessly combines medical imaging data and electronic health records, enabling the accurate retrieval of similar medical images based on specific patient cases.
- 2020 **Deep Metric Learning for Differential Diagnosis of Chest X-rays**
 - Developed a deep learning system that enhances the process of differential diagnosis for chest X-rays. This system empowers radiologists to conduct a guided search, utilizing both medical images and narrative texts for more accurate diagnostic assessments.
- 2019 **Feature Representations of Medical Images for Cross-Modality Retrieval**
 - Conducted an in-depth study, exploring a range of representation learning techniques to acquire a better understanding of how to discern medical image features that are responsive to their respective imaging modalities.
 - I employed TensorFlow, Faiss, and Django to create a robust retrieval system capable of functioning across diverse modalities of medical images.
- 2019-2022 **Analysis of Mansonella Perstans Infections in Equatorial Guinea**
 - Collaborated with a team from the Swiss Tropical and Public Health Institute (Swiss TPH) and partners in Equatorial Guinea to employ machine learning techniques in discovering risk factors associated with Mansonella Perstans infections in the region.
- 2018 **Assessing Malaria Risk in Sub-Saharan Africa through Housing Conditions Analysis**
 - Built a data processing pipeline using Python, PostgreSQL, and scikit-learn. Subsequently, I trained an XGBoost model to identify risk factors for malaria infections in Rusinga Island, Kenya.

Selected Technical Projects

- July.– Oct. 2023 **RSNA 2023 Abdominal Trauma Detection**, Kaggle Challenge
- Collaborated with a Radiologist from St. Paul's Hospital, to develop a model for the detection and classification of traumatic abdominal injuries.
- July. 2021 **Acceleration of Microstructure Imaging in Diffusion MRI with Deep Learning**
- As a participant in the University College London 2021 Medical Image Computing Summer School (UCL-MedICSS), I collaborated with a team of three to create a Convolutional Neural Network (CNN) model that can accurately reconstruct Diffusion Tensor Imaging (DTI) from highly accelerated scans.
- June. 2021 **Generating Synthetic Patient-reported Outcomes to Foster Collaboration in Clinical Settings**
- I was among top-2 finalists among participants from 24 European universities in the Roche Healthcare Xplorers program competition, where I developed a GAN model to generate patient-reported outcomes for cancer patients.
- Sept. 2020 **"Save Life": Connects First Responders to Medical Emergencies**
- Selected to participate in HackZurich, the largest hackathon in Europe, with an acceptance rate of 11%.
 - Was part of a five-member team among 283 teams, that developed an Android application connecting the nearest available clinicians to medical emergencies.
- July 2018 **Project "Ring Parable"**
- As part of a three-person team, we analyzed interaction patterns between different religions and beliefs in specific countries using the GDELT dataset. Our project earned us the first-place position in the 2018 ScaDS summer school hackathon held in Leipzig, **Germany**.

Leadership/Student Supervisions

- Jan –Feb 2024 **Interviewer**, UBC Faculty of Medicine, MD Undergraduate Program
- Volunteered to interview the 2024 UBC MD Undergraduate Program applicants.
- June 2023–Present **Machine Learning Lead**, Myocardial Scarring AI Project
- As an ML Lead in the current project, I supervising two graduate students, one with a Medicine and the other with a Computer Science background, on the whole model development life-cycle.
- Nov 2023–Present **Mentor**, Emerging Leaders in AI: Ph.D. Prep Program, 2023 - 2024
- Participating in the "Emerging Leaders in AI Program" organized by the Black in AI organization to mentor black students from various places through their application to top Ph.D. programs.
- 2014 – 2015 **Rising Star**, Google Chrome Help Forum
- Volunteered in the 'Google Top Contributors' program to assist Chrome users by addressing their queries.
- 2012–2013 **Google Student Ambassador**, (GSA), DIT
- Served as liaison between Google and DIT.
 - Founded and led a team of eight students to organize events and seminars focused on Google technologies.
 - Led DIT to achieve the 7th position among 65 African universities in the Map-Up Week competition.
 - Selected by Google Sub-Saharan Africa University Programs team to be in a team of 4 among 170 African ambassadors to manage social media channels for the GSAs class of 2013.

Awards and Honours

- 2023 **CVPR/Black in AI Travel Grant**
- Awarded a grants to attend in Computer Vision and Pattern Recognition Conference in Vancouver, Canada.
- 2022 **CVPR Travel Grant**
- Awarded a grants to attend in Computer Vision and Pattern Recognition Conference in New Orleans, USA.

2018 **Streamline Hackathon Winner**

- My team was awarded from ScaDS.AI (Germany Center for Scalable Data Analytics and Artificial Intelligence) in recognition of our victory in the hackathon during the 4th International Summer School for Big Data and Machine Learning.

2017 **Swiss Government Excellence Scholarship (ESKAS)**

- Awarded to only 4 students from Tanzania to pursue Ph.D. studies at Swiss Universities.

2015 **ABE Initiative Scholarship**

- I was 1 of the 156 students selected from across the entire African continent to receive this prestigious scholarship from the Japanese Government, enabling me to pursue master's studies in Japan.

2013 **Indian Technical and Economic Cooperation (ITEC) Scholarship**

- Selected among 28 individuals from 19 Commonwealth countries to undergo intensive training in web application development at CDAC-Noida, India.

2013 **Second Best Student**

- Awarded by the DIT council for achieving the second-highest academic performance in the Bachelor of Computer Engineering class of 2013.

Reviewing/Committee

- IEEE Access
- IEEE EMBS BHI 2024
- Medical Image Computing and Computer Assisted Intervention (MICCAI-2024)
- Deep Learning Indaba-2024
- African Computer Vision Summer School (ACVSS-2024)
- Tanzania Annual ICT Conference (TAIC-2022)
- International Conference on New Trends in Information and Communication Technology (NTICT-2020)

Programming Competencies

Fluent in Python

Competent in Java, C, PHP, JavaScript, SQL, HTML, CSS

Libraries PyTorch, TensorFlow, Keras, NumPy, scikit-learn, XGBoost, Django, pandas, Faiss, OpenCV, NLTK,
Used WEKA, Spring, Hadoop, Spark, BeautifulSoup, CakePHP, Node.js, jQuery, Bootstrap

Cloud GCP, AWS

Specialized Training

Aug. 2022 **Roche PMDA Summer School, F. Hoffmann-La Roche AG, Basel**

- Selected to participate in the Predictive Modeling and Data Analytics (PMDA) summer school, organized by Roche AG, which focused on single-cell gene expression in drug discovery.

Aug-Oct. 2013 **Specialized Program on Web Application Development, C-DAC, Noida, India**

- I went to **India** for 3-months of intensive training in web application development using open-source tools (Java, PHP, MySQL) at the Centre for Development of Advanced Computing (C-DAC) in Noida.

Professional Societies

ACM, IEEE, EMBS, MICCAI, EuroPython Society, Ro'ya-CV4Africa, Black in AI

Languages

Swahili (Native), English (Fluent), Japanese (Basic), German (Beginner)