

Sserunjogi Richard

[s](#)sserurich | [i](#)n sserunjogi-richard | [g](#)lobe sserunjogirichard.com | [e](#)mail sserurich@gmail.com | [G](#) Scholar

BIOGRAPHY AND RESEARCH INTERESTS

I have over 4 years of research experience in academia and international collaborations. My research interests include advancing Artificial Intelligence(AI) and its application for social good. Developing AI solutions to address global challenges, particularly in sustainability, such as air pollution, climate change and public health. Leveraging deep learning for geo-spatial and temporal data, applying machine learning and computer vision to process satellite imagery and remote sensing data for environmental monitoring and sustainable urban development.

EDUCATION

Master of Science in Computer Science
Bachelors of Science in Computer Science

Makerere University 2017 - 2020
Makerere University 2012 - 2015

WORK EXPERIENCE

Data Science Lead - AirQo, Makerere University **August 2021 - Present**

- Lead and oversee a team of 6 data scientists & ML engineers plus 10+ research fellows. Delivered over four AI-driven solutions including air quality forecasts, estimating pollution from satellite observations, calibrating low-cost sensors, identifying stationary pollution sources from satellite imagery, sensor placement optimization.
- Contribute towards several grant writing initiatives e.g secured & manage a grant from Mozilla.
- Spearhead various AI-data workshops and STEM challenges, contributing to research. Supported over 5 data challenges with external partners such as Zindi, Fruitpunch AI, Mozilla etc successfully attracting global participation of more than 2,000 users who contributed valuable solutions.

Assistant Lecturer - ACE, Makerere University **February 2020 – Present**

- Co-Instruct Big Bio-Data Analysis course for MSc & PhD in Bioinformatics programme, attended annually by 9 - 15 students.
- Contributed towards 3 research projects in AI applications for health i.e SIDARISK(Data-driven HIV prevention among young adults in Uganda), HEAL (AI for Health Equity: Transforming Pandemic Preparedness in Uganda), COAST PROJECT (End-to-end AI and data systems for targeted surveillance and management of COVID-19 and future pandemics affecting Uganda).

Data Scientist - AirQo, Makerere University **January 2019 - July 2021**

- Conducted data analysis, visualization, and developed machine learning models for air quality predictions. Developed & maintained data pipeline and analytics platform for visualizing, accessing and downloading air quality data.

Graduate Teaching Assistant - Makerere University **November 2018 – December 2018**

- Co-taught Advanced Java Programming course for MSc Computer Science & Msc Health Informatics, attended by 48 students under the stewardship of Professor Khalid Mughal.

PUBLICATIONS

- [1] P. Adong, E. Bainomugisha, D. Okure, and **Sserunjogi, Richard**, “Applying machine learning for large scale field calibration of low-cost pm2.5 and pm10 air pollution sensors,” *Applied AI Letters*, vol. 3, no. 3, e76, 2022.

- [2] P. Green, D. Okure, P. Adong, **Sserunjogi, Richard**, and E. Bainomugisha, “Exploring pm_{2.5} variations from calibrated low-cost sensor network in greater kampala, during covid-19 imposed lockdown restrictions: Lessons for policy,” *Clean Air Journal*, vol. 32, no. 1, pp. 1–14, 2022.
- [3] D. Okure, J. Ssematimba, **Sserunjogi, Richard**, N. L. Gracia, M. E. Soppelsa, and E. Bainomugisha, “Characterization of ambient air quality in selected urban areas in uganda using low-cost sensing and measurement technologies,” *Environmental Science & Technology*, vol. 56, no. 6, pp. 3324–3339, 2022.
- [4] **Sserunjogi, Richard**, J. Ssematimba, D. Okure, D. Ogenrwot, P. Adong, L. Muyama, N. Nsimbe, M. Bbaale, and E. Bainomugisha, “Seeing the air in detail: Hyperlocal air quality dataset collected from spatially distributed airqo network,” *Data in Brief*, vol. 44, p. 108512, 2022.
- [5] C. Stoddart, L. Shrack, **Sserunjogi, Richard**, U. Abdul-Ganiy, E. Bainomugisha, D. Okure, R. Misener, J. P. Folch, and R. Sedgwick, “Gaussian processes for monitoring air-quality in kampala,” *arXiv preprint arXiv:2311.16625*, 2023.
- [6] A. J. Alaran, N. O’Sullivan, L. Tatah, **Sserunjogi, Richard**, and G. Okello, “Air pollution (pm_{2.5}) and its meteorology predictors in kampala and jinja cities, in uganda,” *Environmental Science: Atmospheres*, vol. 4, no. 10, pp. 1145–1156, 2024.
- [7] O. Ghaffarpasand, D. Okure, P. Green, S. Sayyahi, P. Adong, **Sserunjogi, Richard**, E. Bainomugisha, and F. D. Pope, “The impact of urban mobility on air pollution in kampala, an exemplar sub-saharan african city,” *Atmospheric Pollution Research*, vol. 15, no. 4, p. 102057, 2024.
- [8] G. Okello, R. Nantanda, L. Tatah, **Sserunjogi, Richard**, O. Johnson, B. Awokola, D. Okure, M. Thondoo, P. Green, O. Babajide, *et al.*, “Association between ambient air pollution and respiratory health in kampala, uganda: Implications for policy and practice,” *Urban Climate*, vol. 58, p. 102128, 2024.
- [9] L. Muyama, **Sserunjogi, Richard**, E. Bainomugisha, and D. Okure, “Using gaussian processes for spatial prediction of outdoor air pollution based on calibrated data from distributed low-cost sensor networks,” Manuscript submitted for publication(under review).

PRESENTATIONS, WORKSHOPS & CONFERENCES

Deep Learning Indaba

September 2024 - Dakar, Senegal

- Tutor for AI in Biology practical session.

CLEAN-Air Forum

July 2024 - Lagos, Nigeria

- Co-organised the forum and presented on the need for complementing low-cost sensors with satellite observations by leveraging the advances in machine learning and AI.

Mozilla Technology Fund Summit & Mozfest House

June 2024 - Amsterdam, Netherlands

- Presented on estimating & validating PM_{2.5} using satellite & ground observations in 7 African cities.

Guest Lecture at Yale University

February 2024 - Virtual

- Conducted a guest lecture to 28 graduate students from School of Public Health and Yale School of the Environment under stewardship of Prof. Krystal Pollitt. Presented on the scalable experiences of how AirQo leverages advances in low-cost technologies for sustainable air quality monitoring and evidence-informed action in African cities.

Workshop on Data Science Practices & Processes at AirQo

January 2024 - Kampala, Uganda

- Co-organised the workshop that included sessions on data collection and quality assurance processes, AI Impact at AirQo, data visualisation, digital tools and the research processes. Presented on research processes and collaborations for long-term sustainability.

United Nations Climate Change Conference (COP28)

December 2023 - Dubai, UAE

- Co-organised 3 sessions i.e. using AI and digital solutions as enablers for climate action, investing in Africa’s digital future for climate Action, unlocking climate health equity using digital innovations.
- Supported negotiations on technology mechanisms where AI4ClimateAction was highly discussed.

Data Access & Quality Assurance Workshop **September 2023 - Naivasha, Kenya**

- Presentation and demonstration session on AI and digital solutions for data quality assurance.

Deep Learning Indaba **September 2023 - Accra, Ghana**

- Presented on data visualization and analysis at deep learning indabax Uganda as a pre-event.
- Two poster presentations at the main conference. Reviewed and evaluated posters at the conference.

Air Pollution and its Health Impacts in Africa **June 2023 - Kigali, Rwanda**

- Presented on the scalable experiences of how AirQo leverages advances in low-cost technologies and AI for sustainable air quality monitoring and evidence-informed action in African cities.

AAAI Conference on Artificial Intelligence **February 2023 - (Virtual)**

- Presented about leveraging AI to achieve cleaner air in African cities during the workshop for promoting meaningful, beneficial and informed participation of African communities in the development and utilization of AI solutions.

United Nations Climate Change Conference(COP27) **November 2022-Sharm El-Sheikh,Egypt**

- Presented data outputs from multi-city Cityzens4CleanAir advocacy campaign and findings from the technical report titled "Citizen Science Insights on Air Quality from Three Cities in Africa".

AI for the Social Good **February - March 2022 - Dagstuhl, Germany**

- Presented on estimating air quality in places with no sensors using Gaussian Process.

Data Science Africa **October 2019 - Accra, Ghana**

- Presentation on IoT data visualization under the Fundamentals of IoT Session

ACM Conference on Computing and Sustainable Societies **July 2019 - Accra, Ghana**

- Poster presentation titled "Deep Neural Networks for Air Quality Prediction and Analysis"

AWARDS & GRANTS

- Mozilla Technical Fund Awardee - 2024
- Google AI Impact Grantee - 2019 (Under AirQo)
- ACM COMPASS'19 Travel Scholarship Award - 2019
- SIDA Merit Based Master Scholarship Award - 2018

SKILLS

- **Programming Languages:** Python, Javascript, SQL, R,Java, HTML, CSS, PHP, C-Sharp
- **Tools & Frameworks:** Scikit-learn, Pandas, TensorFlow, Keras, GIS Tools, Latex
- **Others:** Cloud Computing(GCP), Version Control (Git), Databases (Mongo, SQLServer, Postgres)

PROFESSIONAL/COMMUNITY SERVICE

Deep Learning Indaba **September 2023 - Accra, Ghana**

- Reviewed and evaluated posters at the conference.

Shadow Program Committee - ACM COMPASS 2021 **April 2021 - July 2021**

- Reviewed 3 papers on machine learning and computer vision and nominated best paper award candidates from 78 papers.

Lead Web Developer - Makerere Computer Science Department **2018 - Present**

- Volunteered and led the development of computer science department website. Lead a team of about 3 members(students) annually maintaining the site.