

Amelia Taylor, PhD.

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Short Profile

Senior lecturer with a strong interdisciplinary background in mathematics and computer science. Experienced in developing AI and data systems in health, education, financial, governance, and justice domains. Over a decade of experience in academic teaching and research. Experience and knowledge of research systems in the UK, Europe and Malawi.

Education

Heriot-Watt University, Edinburgh (2001 - 2006)

PhD, Mathematical Logic

James-Watt Scholarship: *'A unifying framework for Lambda Calculi and their extensions with explicit substitution operators that is useful for verifying confluence'*.

Babeş-Bolyai University, Cluj-Napoca, Romania (2001)

BSc (First Class Hons.) in Computer Science

Academic Experience

Senior Lecturer in Computer Science, Malawi University of Business and Applied Sciences (MUBAS) / University of Malawi (2015 – Present)

- Instrumental in establishing Artificial and Computational Intelligence modules at undergraduate and graduate level.
- Supervised undergraduate, MSc and PhD students.
- Played a key role in curriculum and program development for MSc Data Analytics.
- Established a research programme in health informatics, a new field at the institution. Recruited a PhD student in Health Informatics under joint supervision with Prof. Todd from the London School of Hygiene and Tropical Medicine.
- Have led, since 2019, Malawi's participation in the Indaba Africa network, an international initiative dedicated to building AI capacity, literacy, and career pathways across the continent (<https://ml.mw/indabax-2>)
- Founded an Artificial Intelligence (AI) research laboratory, Kuyesera AI (<https://kailab.tech>), dedicated to advancing the ethical and context-driven applications of AI in Malawi.
- Initiated and coordinated collaborations with the Ministry of Health and other health institutions in Malawi such as PHIM, EGPAF, MEIRU and internationally with LSHTM in the UK, and APHRC in Kenya and GSFC University in India.

- Initiated and developed research on data standardisation and harmonisation of health data (COVID-19, HIV).
- Pioneered the use of generative AI to train community health workers.
- Led the design and publication of machine-readable datasets (language, health and law) for NLP and AI applications in under-resourced African contexts.
- Developed a Moodle based course platform used to help me facilitate online-based, bloc-release based modules for MSc programs (<https://courses.ml.mw>).

Part-time lecturer for MSc in Artificial Intelligence, University of Mauritius (2021 – present)

- Developed teaching materials and delivered online lectures for two modules: Machine Learning and Data Analytics.

Part-time lecturer, Malawi University of Science and Technology (2023, 2026)

- Developed materials and delivered lectures for the Data Science for Biodiversity module.

Part-time lecturer, University of Malawi (2024 – 2026)

- Taught a Machine Learning module for the PhD in Computer Science program.

Part-time lecturer, Kamuzu University of Health Sciences (2022)

- Taught the module ADS 612, Algorithms and Data Structures in Bioinformatics.

ICT Teacher, St. Andrews International School, Blantyre, Malawi (2013 – 2015)

- Taught GCSE and A-level subjects in Computer Science
- One of my students obtained the highest mark in Africa for his coursework in Edexcel GCSE Information & Communication Technology.

Research Assistant, Heriot-Watt University, Edinburgh, UK (2004 – 2005)

- Part of a research team from Heriot-Watt and the Royal Observatory. Contributed to a database and query language for astronomical data.

Industry Experience

Quantitative Investment Analyst, Alliance-Trust Ltd, UK (2008 – 2012)

- Developed risk and asset allocation models for investment and executive decisions.

Quantitative Analyst, Scottish Widows Investment Partnership (2007 – 2008)

- Built models for pricing derivatives (i.e. interest rate swaps) for managing liability driven investments and managed internal risk models for fixed-income trading.

Quantitative Analyst, DIAM Asset Management, City of London, UK (2006 – 2007)

- Constructed mathematical and statistical modelling for understanding the behaviour of stock markets.

Relevant Grants

- INV55058, Albert Dube (PI) and Amelia Taylor (co-PI), African Population and Health Research Center, 2025-2026, *HDSS Capacity building for the application of AI in enhancing the utility of MEIRU HDSS data*. Develop AI models to improve the process of assigning causes of death through verbal autopsies.
- UNS130629, Jim Todd and Agness Kiragga (PIs), Wellcome Trust, 2022-2024, *INSPIRE Network: building a data science platform*. Developed models for data standardisation and harmonisation using OHDSI/OMOP.
- INV-062606, Amelia Taylor (PI), Gates Foundation, 2023, *Global Challenges Grant for Catalysing Equitable Artificial Intelligence (AI) Use*. Developed AI-enabled systems for community health education and data collection.
- 109622, Sylvia Muyingo, IDRC & SIDA, 2021 – 2023, *COVID-19 Global South AI and Data Innovation Grant: PEACH*. Developed models for data standardisation and harmonisation using OHDSI/OMOP.

Consultancies

- NDICI/2023/448-759, Malawi Judiciary, European Union, Chilungamo II Project, Senior AI Expert (Dec. 2025 – Mar. 2026)
 - Developed and delivered training materials for responsible use of AI in the Malawi Judiciary. The training covered judicial officers and court administrators.
 - Conducted baseline assessments and stakeholder consultations.
- No.0002020159, AI for Malawi - Data Processing and Consulting Services, World Bank, Lead consultant (2026)
 - Leads the structured metadata tagging of media content through supervised student engagement, and
 - Provides technical support for the development and fine-tuning of small audio and text models.

Publications in Health

- Adams R., (..), **Taylor A.** et al. (2026). Mapping the potentials and limitations of using generative AI technologies to address socio-economic challenges in LMICs, *Nat. Comput Sci.* doi: [10.1038/s43588-026-00960-8](https://doi.org/10.1038/s43588-026-00960-8).
- **Taylor, A.**, Kazembe, P. (2024). Assessing language barriers in health facilities in Malawi. *BMC Health Serv Res* 24, 1393, doi: [10.1186/s12913-024-11901-4](https://doi.org/10.1186/s12913-024-11901-4).
- **Taylor, A.**, Kazembe, P. (2025). Revisiting the use and effectiveness of patient-held records in rural Malawi, *BMC Health Serv. Res.* 25, 792, doi: [10.1186/s12913-025-12844-0](https://doi.org/10.1186/s12913-025-12844-0).
- **Taylor, A. et al.** (2024). Self-directed learning for community health workers in Malawi through Generative AI, In *IEEE 12th International Conference on Healthcare Informatics (ICHI)*, Orlando, FL, USA, pp. 574-579, doi: [10.1109/ICHI61247.2024.00092](https://doi.org/10.1109/ICHI61247.2024.00092).

- Kiragga A, Kadengye D, (...), **Taylor, A. et al.** Demonstrating the value of unified data systems across health and demographic surveillance systems in Nairobi County, Kenya to generate insights on global health issues [version 1]. *VeriXiv* 2025, 2:366 (<https://doi.org/10.12688/verixiv.2234.1>)
- Bhattacharjee et al., **Taylor et al.** (2024). INSPIRE Datahub: A Pan-African integrated suite of services for harmonising longitudinal population health data using OHDSI tools, *Frontiers in Digital Health*, Vol. 6, doi: [10.3389/fdgth.2024.1329630](https://doi.org/10.3389/fdgth.2024.1329630).
- Heenaye-Mamode Khan, M., Reesaul, P., Auzine, M.M., A. **Taylor.** (2024). Detection of Alzheimer's disease using pre-trained deep learning models through transfer learning: a review. *Artif. Intell. Rev.* 57, 275, doi: 10.1007/s10462-024-10914-z.
- **Taylor A**, Liwewe T, Todd J., et al. (2024). Insights into COVID-19 data collection and management in Malawi: exploring processes, perceptions, and data discrepancies [v. 1; peer review: 1 approved]. *Wellcome Open Res*, 9:217, doi: [10.12688/wellcomeopenres.21131.1](https://doi.org/10.12688/wellcomeopenres.21131.1).
- **Taylor, A.** , Sokatha, Z. and Junck, L. (2024). Navigating knowledge engineering challenges in integrating large language models into social support initiatives: lessons from Malawi and South Africa, *SSRN*, doi: [10.2139/ssrn.5338803](https://doi.org/10.2139/ssrn.5338803).
- Amadi D, Kiwuwa-Muyingo S, Bhattacharjee T, **Taylor A**, Kiragga A, Ochola M, Kanjala C, Gregory A, Tomlin K, Todd J, Greenfield J, Making Metadata Machine-readable as the first step to providing findable, accessible, interoperable, and reusable population health data: framework development and implementation study, *Online J Public Health Inform* 2024;16:e56237, doi: [10.2196/56237](https://doi.org/10.2196/56237)
- Kiwuwa-Muyingo S., Todd J., Bhattacharjee T., **Taylor A.**, Greenfield J. (2023). Enabling data sharing and utilisation for African population health data using OHDSI tools with an OMOP-common data model, *Front. Public Health, Sec. Digital Public Health* Volume 11, doi: [10.3389/fpubh.2023.1116682](https://doi.org/10.3389/fpubh.2023.1116682).
- Heenaye-Mamode Khan, M., Gooda Sahib-Kaudeer, N., Dayalen, M., Mahomedaly, F., Sinha, G. R., Nagwanshi, K. K., **Taylor, A.** (2022). Multi-class skin problem classification using deep generative adversarial network, *Computational Intelligence and Neuroscience*, vol. 2022, Article ID 1797471, 13 pages, doi: [10.1155/2022/1797471](https://doi.org/10.1155/2022/1797471).

Publications in Machine Learning Applications

- Jaiswal, M., Nagwanshi, K.K., Khan*, M.HM., Upendra, V., **Taylor, A.** (2026). YOLOv8s-WAMNet: enhancing robust vehicle detection under adverse weather via hybrid attention and multi-scale fusion in real time. *Sci Rep.*, doi: [10.1038/s41598-026-46527-5](https://doi.org/10.1038/s41598-026-46527-5).
- **Taylor, A.**, Robert, A. (2025). Using machine learning to detect fraudulent SMSs in Chichewa. In: Sinha, G.R., Fan, C.P., Bajaj, V., Nisar, H., Ullo, S.L. (eds) *Integrating AI in Science, Management, and Technology. AISMT 2025. Communications in Computer and Information Science*, vol 2699. Springer, doi: [10.1007/978-3-032-08260-2_12](https://doi.org/10.1007/978-3-032-08260-2_12).
- Chapuma, E. ; Mengezi, G, Msasa, L., **Taylor, A.** (2025). mwBTFreddy: A dataset for flash flood damage assessment in urban Malawi, *arXiv*, [10.48550/arXiv.2505.0124](https://arxiv.org/abs/10.48550/arXiv.2505.0124).

- Heenaye-Mamode Khan, M., Nagwanshi, K. K., Azhar, M., Emerith, G. Baichoo, S., Sinha, G. R., **Taylor, A.** (2024). An enhanced deep neural network model for the detection of anomalous behaviour of drivers in road traffic, *Journal of Sensors*, 5295932, 13 pages, 2024. doi: [10.1155/js/5295932](https://doi.org/10.1155/js/5295932).
- **Taylor, A.V.**, Mfutso-Bengo, E. (2023). Towards a machine understanding of Malawi legal text. *Artif Intell Law* 31, 1–11, doi: [10.1007/s10506-021-09303-6](https://doi.org/10.1007/s10506-021-09303-6).
- Hara, M., **Taylor A.**, Gawanani P. (2023). Predicting school dropout in Malawi, In *4th EAI International Conference on Technology, Innovation, Entrepreneurship and Education*, September 27-28, Cambridge, UK.
- **Taylor, A. V.**, Kaunda, A. et al. (2020). The role of project and group work in teaching and assessing large classes, *In the Malawi Education Conference, Zomba*.
- **Taylor, A.V.** (2020). MWCC: A corpus of Malawi criminal cases. *Natural Legal Language Processing Workshop*, In *26th ACM SIGKDD International Conference on Knowledge Discovery & Data Mining (KDD 2020)*.
- Kachule, B. & **Taylor, A.** (2018). Understanding factors affecting utilisation of the Case Management System of the Malawi Judiciary. In *EGPA 2018, EGPA study group XVIII on justice and court administration*, Lausanne, Switzerland.

Language (Chichewa)

- Chimkono, T., **Taylor A.**, Mphako-Banda, E., Kishindo, P. (2023). The effect of using entry-level keyboards in improving user-adaptability to new keyboards: Case of the Central-Bantu keyboards, *Telematics and Informatics Reports*, Volume 11, 100073, doi: [10.1016/j.teler.2023.100073](https://doi.org/10.1016/j.teler.2023.100073)
- Adelani et al., **Taylor A.** et al. (2023). MasakhaPOS: Part-of-Speech tagging for typologically diverse African languages, *In Proceedings of the 61st Annual Meeting of the Association for Computational Linguistics*. (pp. 10883-10900).
- Gobin-Rahimbux, B., Gooda Sahib, N., Peerthy, N., **Taylor, A.** (2023). A Voice-based personal assistant for mental health in Kreol Morisien, *Journal of Electrical and Computer Engineering*, 5532967, 12 pages, doi: [10.1155/2023/5532967](https://doi.org/10.1155/2023/5532967)
- Adelani et al., **Taylor A.**, et al. (2022). MasakhaNER 2.0: Africa-centric transfer learning for named entity recognition, In the *Proceedings of the 2022 Conference on Empirical Methods in Natural Language Processing*, Abu Dhabi, pp. 4488—4508, doi: [10.18653/v1/2022.emnlp-main.298](https://doi.org/10.18653/v1/2022.emnlp-main.298).
- Chimkono, T., Mpako-Banda, E., **Taylor, A.**, Kishindo, P. (2021). A usability study of the Central-Bantu multilingual keyboards, *International Journal of Human-Computer Interaction* 37(9):1-15, doi: [10.1080/10447318.2021.1895530](https://doi.org/10.1080/10447318.2021.1895530).
- Siminyu, K., Kalipe, G., Orlic, D., Abbott, J. ... **Taylor, A.**, ... Naski, M. (2021). AI4D -- African Language Program. *arXiv:2104.02516*. <https://arxiv.org/abs/2104.02516>
- **Taylor, A.** (2020). Using ML to close the vocabulary gap in the context of environment and climate change in Chichewa, ClimateChangeAI Workshop, In *ICLR 2020 Workshop on Tackling Climate Change with Machine Learning*, [link](#).

Mathematical Logic

- **Taylor, A.** (2006). A unifying framework for Lambda Calculi and their extensions with explicit substitution operators that is useful for verifying confluence, PhD Thesis, Heriot-Watt University, uri: <http://hdl.handle.net/10399/119>.
- **Taylor, A.** (2005). Abstract conditions for the confluence of explicit substitution calculi, In *Electronic Notes in Theoretical Computer Science* 123:213, [10.1016/j.entcs.2004.05.016](https://doi.org/10.1016/j.entcs.2004.05.016).
- **Taylor, A.** (2005). Towards a global schema for AstroGrid and query answering over that schema. *Technical report HW-MACS-TR-0050*, Heriot- Watt University, Edinburgh.

Datasets I developed and/or coordinated:

- [Spoken Chichewa Dataset](#) This was used in a news classification competition on [Zindi.Africa](#).
- [Chichewa Parts of Speech \(POS\) and Named Entity \(NE\) Annotated dataset](#)
- [Public Health Questions and Answers Dataset](#) used for a LLM competition on [Zindi.Africa - a first such competition on the platform](#).
- [Satellite image dataset for assessing damage caused by Cyclone Freddy in Malawi](#) won a competition from AWS/IRCAI.
- [Malawi Criminal Cases Annotated Dataset](#)

Booklets and Selected Blog Articles

- St. Michael and All Angels: Blantyre, Malawi, ISBN-13:978-9990809831, 2021, [link](#).
- Can AI Have Its Cake and Eat It? Reducing Bias in AI Models May Not Always Be Desirable, In *AI Research and COVID: Journeys to Gender Equality and Inclusion series*, 2021, [link](#).
- A Short Language Profile and the Need for Chichewa Datasets, 2020, <https://medium.com/@avtaylor14>.
- The Malawi National Data Center, 2022, <https://medium.com/@avtaylor14>.
- Deep Learning Indaba articles: <https://deeplearningindaba.com/blog/author/amelia/>