Charles Delahunt CV

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13 years' experience applying AI to global health challenges: My work focuses on understanding the requirements of the clinical use-case, and building these needs into the structure of AI solutions at every stage of AI development. That is, shaping AI solutions to deploy successfully.

Global Health Labs, Bellevue, WA 2012 – October 2025 (lab closure)
Senior Research Engineer, AI for medical diagnostics. Missions:
- Develop AI algorithms for global health use cases, always focused on tailoring AI development to the specific needs of the clinical use case.
- Collaborate with Gates Foundation teams (MNCH, NTDs) and grantees to provide technical assistance and guidance to move AI projects forward, e.g.:
    - Guided a team at UC Berkeley to build detection algorithms for *S. haematobium*.
    - Developed detection algorithms for *Loa loa*.
    - Worked with UNC on the LABOR dataset, especially ownership of sensor data: cleaning, analyzing, and applying to research questions.
- Present talks and workshops on AI for global health at medical AI conferences.
- Projects: automated malaria detection (current state of the art); Neglected Tropical Disease diagnosis (schistosomiasis, *Loa loa*); pregnancy risk stratification; fetal monitoring; medical sensor data; vitamin A deficiency detection from pupillary response; obstetric and lung ultrasound; cervical cancer diagnosis; LLMs to classify conference abstracts.

Key skills
- Analyze, interrogate, and understand data sets, in their functional medical context
- Research and develop end-to-end AI systems
- Develop techniques for tailoring AI to concrete clinical use cases
- Assess algorithm performance and results
- Collaborate with field experts and partners
- Effective story telling: Papers and conference presentations
- Ask questions, in all contexts – to clarify, open up avenues, and move work forward
- Take initiative

Education
- Ph.D. Electrical and Computer Engineering, University of Washington, 2018
- B.S. Math and Music, MIT

Languages
- English, French, Spanish, Python, some Linux and Powershell.

Invited conference talks on AI for global health

- Talks:
    ML4H 2023; SPaM 2024; MICCAI 2024; SIPAIM (Guatemala) 2024; Phaw-AI (Peru) 2025, SPARK (Nigeria, virtual) 2025.
- Tutorials, workshops, and special sessions:
    MICCAI 2022, 2023, 2025; IEEE GHTC 2020, 2022, 2024; IEEE New Era 2024; SIPAIM 2024, ML4H 2024, ASTMH 2024.

Other work on AI for global health

- Scientific committee member (schistosomiasis subcommittee) for ASTMH. link
- Applied LLMs to vet abstracts submitted to the annual ASTMH conference, 2024, 2025.
- Advisor, WHO document on digital microscopy for malaria, 2023.
- Conference Area Chair (ML4H, MICCAI). Academic Editor (PLOS Digital Health).
- Board member, RISE-MICCAI (Reinforcing inclusiveness & diversity and empowering MICCAI in low-to-middle income countries). link
- Chair, MICCAI Travel Grants Committee, 2025 (grants for LMIC-based researchers).
- Initiated and organized donation of our 9 GPU servers to African labs as our lab closes.

Selected papers on AI for global health   ∗ indicates lead author

- ∗ *Algorithms to detect Loa loa in fresh blood samples.* In preparation, 2025.
- ∗ *Beyond validation loss: Improving a model's clinical performance using clinically-relevant optimization metrics.* In review, 2025. link
- ∗ *Designing AI algorithms to suit local context.* MICCAI MIRASOL, 2025. link
- ∗ *Reducing Poisson error can offset classification error: a technique to meet clinical performance requirements.* ML4H, 2024. link
- ∗ *Metrics to guide development of machine learning algorithms for malaria diagnosis,* Frontiers Malaria, 2024. link
- *Multi-contrast ML improves schistosomiasis diagnosis,* PLOS NTDs, 2025. link
- *A schistosomiasis dataset with bright and darkfield images.* MICCAI Open Data, 2024. link
- *How good are synthetic medical images? An empirical study with lung ultrasound.* MICCAI Sashimi, 2023. link
- *Evaluation of an automated microscope using machine learning for the detection of malaria in travelers returned to the UK.* Frontiers Malaria, 2023. link
- *Performance of a fully-automated system on a WHO malaria microscopy evaluation slide set.* Malaria J, 2021. link
- ∗ *Algorithms to predict moisture content of grain using relative humidity time-series.* IEEE GHTC, 2020. link
- ∗ *Fully automated patient-level malaria assessment on field-prepared thin blood film microscopy images.* IEEE GHTC, 2019. link
- ∗ *Limitations of haemozoin-based diagnosis of P. falciparum using dark-field microscopy*, Malaria J, 2014. link
- ∗ For more papers on AI for global health and also on basic AI research, please see https://charlesdelahunt.github.io

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