Charles Delahunt CV

April 2026
Seattle, WA

206-696-1375; delahunt@uw.edu; linkedIn
Website: https://charlesdelahunt.github.io

Expert in AI for healthcare I focus 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.

Key skills

- Analyze, interrogate, and understand complex data sets, in their functional medical context
- Research and develop end-to-end AI systems for healthcare
- Develop techniques for tailoring AI to concrete clinical use cases
- Assess algorithm performance and results, including defining clinically-relevant metrics
- Collaborate with field experts and partners
- Effective story telling: Papers and presentations
- Ask questions, in all contexts – to clarify, open up avenues, and move work forward
- Take initiative
- Cheerleader – *go team!*

Affiliate Faculty in Electrical and Computer Engineering, U. of Washington, Seattle. 2026 – present

Senior ML Research Engineer for medical diagnostics 2012 – October 2025
Global Health Labs, Bellevue, WA, a Gates-funded research lab (closed down in Dec 2025)

- I developed AI algorithms for >12 global health use cases, always focused on tailoring AI development to the specific needs of the clinical use case. Some examples:
- *Automated malaria microscopy:*
  This is a high-value medical need. But it's a hard task due to small targets and noisy blood films. Prior ML efforts have also failed due to lack of medical focus. I led our algorithm dev team and took personal ownership of understanding the use case (via literature and experts), curating our data, deriving evaluation metrics, and shaping the architecture to fit the specifics of the task. Our resulting algorithms are the best extant (SOTA), validated in 5 trials in 14 countries, and handed off to a commercial partner. I'm currently preparing a 12 TB dataset for public release.
- *Biosensor data in labor:*
  A Gates Foundation (GF) grantee had collected a vast dataset - everything that happened to 12,000 women in labor: clinical data (events, labs, outcomes) and sensor data (maternal, fetal). But the grantee did not have capacity to deal with the sensor data. I took full ownership of all aspects of this data: explored and assessed, cleaned (lots…), wrote reports, prepared it for CTG annotation, and led analysis sprints to address GF priorities. Results included actionable findings for GF and a clean and usable sensor dataset. I'm currently helping prepare the dataset of public release, and assisting the grantee in further analyses.
- *LLMs for text classification:*
  ASTMH, the premier tropical medicine conference in the U.S. receives '000s of abstracts in 54 categories to their conference each year. But when abstracts are submitted to the wrong category, they get distributed to the wrong review committees, a huge headache to fix *post-hoc*. I volunteered our lab and led a team to build an LLM-based model to vet the submitted abstracts. The resulting model identifies potentially misclassified abstracts, enabling

correction before distribution to review committees – effective, appreciated, now in 3rd year.

- I also led AI projects for: Neglected Tropical Disease diagnosis (schistosomiasis, loiasis); pregnancy risk stratification; vitamin A deficiency detection from pupillary response.
- Other AI projects: obstetric and lung ultrasound; cervical cancer diagnosis.
- Took leadership on communications training at our lab.
- > 16 invited talks and workshops (lead organizer) at ML and health conferences (inc. MICCAI, ML4H, ASTMH, IEEE GHTC) on how to design AI to effectively deploy in health use cases.

Education

- Ph.D. Electrical and Computer Engineering, U. of Washington, Seattle. 2018
- B.S. Math and Music, MIT
  (GRE: verbal 800/800; quantitative 800/800)

Languages

- English, French, Spanish, Python, PyTorch, SQL, Matlab, Linux, Powershell.

Patents

- Image analysis systems and related methods. Patent # 10061972
- Devices and methods for staining and microscopy. Patent # 9453996

Selected papers on AI for healthcare ∗ indicates lead (co-) author

∗ *Beyond validation loss: Improving a model's clinical performance using clinically-relevant optimization metrics*. In review, 2026. 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
∗ *Automated detection of Loa loa: A field trial in Cameroon*. In review, 2026. link
- *Algorithms to detect age features from ultrasound blind sweeps*. Gates Open Research, 2025. link and repo
- *Performance of a fully-automated system on a WHO malaria microscopy evaluation slide set*. Malaria J, 2021. link
∗ *Fully automated patient-level malaria assessment on field-prepared thin blood film microscopy images*. IEEE GHTC, 2019. link
∗ Full papers (~30) on AI for healthcare and basic AI research: https://charlesdelahunt.github.io

Service work in AI for global health

- Scientific committee member (schistosomiasis subcommittee) for ASTMH. link
- Advisor, WHO document on digital microscopy for malaria, 2023.
- Peer review: 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, 2026 (grants for LMIC-based researchers).
- Initiated and organized donation of our 9 GPU servers to African labs as our lab closed.

☺ devoted runner