Stephen Burkot

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Data Driven Engineer

Data-driven engineer with extensive experience translating complex concepts into innovative, functional solutions. Expertise spans mechanical design, prototyping, and software-driven validation across biomedical and diagnostic technologies. Adept at leveraging engineering principles, data analytics, and machine learning to optimize product performance and drive measurable impact. Proven ability to lead cross-functional teams and execute projects from RandD through global deployment.

Key Skills

SolidWorks | R | MATLAB | Python | AutoCAD | Arduino | Android Studio | Trello | Github | OpenLCA | Office (PowerPoint | Excel | Word | Visio) | Rapid Prototyping | Manufacturing Tools | Machine Learning | Data Pipeline Automation | Regulatory Compliance | Product Lifecycle Management | Technical Documentation

Professional Experience

Global Health Labs, Bellevue, WA **June 2020 - August 2025**

Research Engineer and Product Implementation Engineer

Engineering and Mechanical Design

Authored acceptance testing protocols for electromechanical devices to verify mechanical, thermal, and electrical properties.

- Created complete technical design folders for CE review, including BOMs, risk assessments, conformity declarations, QA processes, mechanical drawings, and user manuals.
- Fabricated custom test mechanical and thermal platforms and jigs to facilitate measurement in biohazardous (BSL 2+) environments.
- Collaborated with cross functional groups with members from the electrical, optical, bioengineering teams to define product specifications, evaluate performance, and iterate appropriately.
- Engineered a novel low-pressure oxygen delivery system, leveraging MATLAB fluid modeling to maximize uptime during power outages and ensure uninterrupted patient care.
- Originated custom light-sealed, PID-controlled imaging chambers to capture high-resolution time-series data of fluorescent bacterial growth.
- Developed android application to facilitate remote collection of field data and automatically sync data to Google Firebase database
- Designed a suite of SolidWorks-based testing fixtures to systematically evaluate multiple variables in micro-sample collection, enabling optimization of accuracy and reliability in biological assays.
- Prototyped and validated a custom 3D-printed mass-spring-damper system, automating the production of thin blood smears for microscopy and reducing technician variability.

Product Development and Innovation Leadership

Drug Quality: Directed end-to-end development of an NIR spectroscopy device for medicine quality control. Establishing design controls, authoring PRDs and risk matrices, defining regulatory strategy, and guiding market readiness.

- Cervical Cancer: Oversaw full software lifecycle for a mobile machine learning diagnostic tool for cervical cancer—translating user feedback into features, managing QA processes, and coordinating multinational rollouts across six countries.
- Adherence to Tuberculosis Treatment: Directed the development of digital adherence technologies using human-centered design; facilitated technology transfer and scale-up through partnership with WisePill.

Partnership and Stakeholder Engagement
Presented project updates to senior stakeholders including Bill Gates, board members, and Gates Foundation leadership.

- Represented Global Health Labs at conferences, including the Union Conference on Lung Health and ASTMH.
- Built and maintained partnerships with national regulatory authorities in Kenya, Malawi, and Namibia, along with academic institutions and NGOs, to support pilot studies and regional regulatory alignment.
- Authored strategic briefs, led partner engagement plans, and supported internal/external communication of program goals and results.

Data Science and Machine Learning
Cervical Cancer: Deployed and evaluated the diagnostic performance of a phone-based machine learning tool to detect cervical pre-cancer in a clinical trial of 25,000 women across five countries.

  - Standardized and automated data pipelines in R, enabling rapid, reliable analysis across large datasets.
  - Quantified diagnostic robustness through sensitivity analysis, assessing the impact of ground-truth variability on ML model performance.
  - Performed a cost-effectiveness analysis (CEA) of this tool as compared to standard tests and treatments using HPVSim, a large agent-based model from the Institute for Disease Modeling
  - Led the integration of machine learning models into the android application and performed verification testing prior to release.
  - Managed field deployment of mobile applications, monitoring data integrity and troubleshooting anomalies to ensure high-quality clinical datasets.
- Detecting Tuberculosis with Cough Sounds: Co-led the CODA TB DREAM Challenge with Sage Bionetworks and clinical partners, exploring AI/ML cough detection models for TB in an open science framework.
- Malaria: Assessed the diagnostic performance automated microscopes equipped with a machine learning model as compared to qPCR and microscopy using R and python.
- Tuberculosis: Calculated the diagnostic performance (sensitivity, specificity) of using tongue swabs as opposed to sputum for detecting tuberculosis from clinical data collected in Uganda.

Global Good Fund I, LLC / Intellectual Ventures Laboratory, Bellevue, WA **June 2016 - June 2020**
Field Engineer

- Led field trials of diagnostic devices including authoring study protocols, SOPs, and training modules to ensure consistency and regulatory compliance
- Directed deployment and performance evaluation of medical technologies across Africa and Asia, coordinating logistics, training, and reporting with local partners.
- Trained local teams, monitored study accuracy, and ensured reliable performance evaluation of devices in low-resource environments.

Georgia Tech Research Institute (GTRI) – Advanced Concepts Lab, Atlanta, GA **January 2013 - August 2014**
Student Assistant, Co-Op – 3 Semesters

- Designed and machined antenna radomes, backplanes, and precision fixtures to support electromagnetic testing in anechoic chambers, waveguides, and focused beam systems.

Education

Masters of Science, M.S. Mechanical Engineering Overall GPA: 4.0
Bachelors of Science, B.S. Mechanical Engineering Overall GPA: 3.68 | Highest Honors
Georgia Institute of Technology – College of Engineering, Atlanta, GA

Publications (Co-author)

- Scientific Data: “A dataset of solicited cough sound for tuberculosis triage testing,” 2024.
- Frontiers in Malaria: “Evaluation of an automated microscope using machine learning for the detection of malaria in travelers returned to the UK,” 2023.
- Malaria Journal: “Field evaluation of the diagnostic performance of EasyScan GO: a digital malaria microscope device based on machine-learning,” 2022.
- American Journal of Tropical Medicine and Hygiene: “A novel malaria lateral flow assay for detecting Plasmodium falciparum lactate dehydrogenase in Busia, Uganda,” 2022.
- PLOS ONE: “Characterization of oral swab samples for diagnosis of pulmonary tuberculosis,” 2021.
- PLOS ONE: “Clinical validation of an open-access SARS-CoV-2 antigen detection lateral flow assay, compared to commercially available assays,” 2021.
- PLOS ONE: “Field evaluation of a prototype tuberculosis lipoarabinomannan lateral flow assay on HIV-positive and HIV-negative patients,” 2021.
- BMC Pulmonary Medicine: “Efficacy and safety of oxygen-sparing nasal reservoir cannula for treatment of pediatric hypoxemic pneumonia in Uganda: a pilot randomized clinical trial,” 2020.