Axel Jacobsen

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Experience

Mar 2022 — Present **R&D Engineer**, *Chan-Zuckerberg Biohub*

We are creating a low-cost imaging cytometer for malaria diagnosis. This device images unstained blood and detects malaria parasies with an object detection model that I am creating (called YOGO)

- Developed YOGO, a deep learning model with a limit of detection of 0.00038% parasitemia. Reaches a framerate of 120 FPS on Raspberry Pi 4 with an Intel NCS2, and 550+ FPS on an A100 GPU
- Worked on a deep learning model to predict image focus. Successfully deployed to collect over 10 TB of data from Uganda
- Architected and optimized software for the microscope. Key contributions included creating a multiprocessing manager to efficiently move data between processes for heavy calculations, reducing execution times from 16.3 ms to 4.8 ms

Jun 2020 — Dec 2021 **R&D Engineering Intern**, *Chan-Zuckerberg Biohub*

- Overhauled the Opentrons OT-2 pipetting robot's codebase, reducing its size by 60%
- Developed an ADC driver for a luminometer detecting COVID-19 antigens, deployed in Bangladesh. https://doi.org/10.1101/2023.05.18.23290120.

May 2019 — Aug 2019 **Engineering Intern**, *Wildlife Computers*

- Designed a PCB to protect digital lines from interference
- Developed C++ software for automatic PCB component verification

Jan 2018 — Apr 2018 **Data Science Co-op**, *Control Mobile*

- Evaluated and improved 300+ SQL queries, achieving a 65
- Worked on bug fixes, code development, and refactoring

Other

Engineering Physics Autonomous Robot Competition

- Engineered an autonomous robot over 8 weeks, capable of navigating an obstacle course and collecting objects. Website here
- Developed software for IR frequency detection and robot subsystem control

Education

Graduated May 2022 **B.ASc Engineering Physics**, *University of British Columbia*

Winter 2019 **Exchange Semester**, *Denmark Technical University*

- Won the DTU OS Course Competition with the fastest reverse hash server
- Developed an LSTM-based Deep Q-Network for a machine learning course