

# Axel Jacobsen

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## Experience

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

Present We are creating a low-cost imaging cytometer for malaria diagnosis. This device images unstained blood and detects malaria parasites 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. Reached 1680 FPS on an A100 GPU for (772, 1032) px images
- 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 — **R&D Engineering Intern**, *Chan-Zuckerberg Biohub*

- Dec 2021
- 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 — **Engineering Intern**, *Wildlife Computers*

- Aug 2019
- Designed a PCB to protect digital lines from interference
  - Developed C++ software for automatic PCB component verification

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

- Apr 2018
- Evaluated and improved 300+ SQL queries, achieving a 65
  - Worked on bug fixes, code development, and refactoring

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## Other

### Engineering Physics Autonomous Robot Competition

- Engineered an autonomous robot over 8 weeks, capable of navigating an obstacle course and collecting objects. <https://axel-jacobsen.github.io/ENPHRobot/>
- Developed software for IR frequency detection and robot subsystem control

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## Education

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

Dec 2021

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