Axel Jacobsen

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SKILLS

PROGRAMMING LANGUAGES Strong with Python, experienced in C/C++, Java, MATLAB

EXPERIENCE

R&D ENGINEERING INTERN | Chan-Zuckerberg Biohub | Jun 2020 - Dec 2020

- Rewrote almost all the software for the robot with a focus on speeding up epithelial cell growth protocols - new code base size is 1/4 of the original, with at least doubling of efficiency for frequent operations
- Redesigned computing architecture so arbitrary instruments (e.g. cell counters) can be used during protocols instead of just the Opentrons instruments

ENGINEERING INTERN | Wildlife Computers | May 2019 – Aug 2019

- Wrote C++ firmware to test PCBs that arrive from fabrication - autonomously confirms correct placement of components which allows for identification of faulty boards, improving production throughput
- Designed a digital isolator PCB to isolate the company's hardware from measurement devices, allowing for low-noise and accurate voltage measurements

DATA SCIENCE CO-OP | Control Mobile | Jan 2018 – Apr 2018

- Wrote Python scripts to analyze and rank order over 300 individual SQL queries by their runtime to optimize the SQL database; reduced the runtime to fetch and display customer data by 65%
- Worked with the agile backend team to fix existing bugs, write new code, and to refactor current code

PROJECTS

VARIOUS DEEP LEARNING PROJECTS

- Asynchronous Advantage Actor-Critic Model, reinforcement learning optimized for CPU
- Deep Q-Network in PyTorch to play Atari's Pong, a project at the Denmark Technical University
- Feed-forward neural net written with Numpy solves MNIST with 97.2% accuracy, vectorized for fast training

AUTONOMOUS ROBOT COMPETITION | Engineering Physics

- Deployed a real-time object detection algorithm on Raspberry Pi
- Created signal processing software to quickly and accurately detect certain IR signals
- Wrote C control software and created circuits to control the mechanical subsystems

EDUCATION

UNIVERSITY OF BRITISH COLUMBIA | Expected May 2022

B.ASc Engineering Physics, GPA 3.70
Coursework includes Object-Oriented Programming, Digital Systems and Microcomputers, Signals and Systems, Applied Quantum Mechanics, Linear Algebra, Honours Multivariable and Vector Calculus, Complex Analysis, Optics, Statistical Mechanics

DENMARK TECHNICAL UNIVERSITY | Winter 2019

Exchange Semester
Coursework includes Operating Systems, Deep Learning, Robotics, Computationally Hard Problems