Ben Holmes

Vancouver, BC • 587.341.9957 • ben.holmes@alumni.ubc.ca • bholmes.ca

Skills

Programming Strong Python, Matlab, and Java developer. Experience with SQL, Go, C/C++, JavaScript, and R.

Deep Learning Experience implementing LSTMs, CNNs, GANs, and reinforcement learning models in PyTorch, TensorFlow, Keras, and MXNet. Strong understanding of the underlying math.

Data Science Data exploration and cleaning, feature engineering, large datasets, web scraping, written and verbal communication. Regressions and machine learning models. Skilled in Pandas, Dask, and Sklearn.

Experience

Applied Technologies Co-op
Jan 2020 - Present
Specialized Bicycle Components
Morgan Hill, CA

- Used a dataset of over 6000 Strava rides to study the effect of temperature on race times and rider power output.
- Wrote a general algorithm for solving kinematics of any full-suspension bicycle using Newton-Raphson iteration. Reduced algorithm runtime by an order of magnitude compared to existing, bike-specific approach.
- Developed prototype digital bicycle pump. Used signal processing to remove the pressure spikes during a pump stroke. Designed low power circuitry and software to bring total battery life to 6 months of constant use.

Quantitative Analyst Co-op
May - Aug 2019
Castleton Commodities
Calgary, AB

- Used Python and Dask to perform data exploration on a large dataset (over 100GB) to verify industry priors about freeze-offs — a poorly understood but crucial factor in the price of natural gas markets.
- Developed, trained, and validated machine learning models using PyTorch and Scikit Learn to predict natural gas production as a function of multiple variables.
- Documented research process and results, and presented my findings to the data science and trading teams.

Software Developer Co-op
Jan - May 2018
Blue Willow Systems
Vancouver, BC

- Researched emerging localization technologies and wrote Python algorithms for a proof of concept that integrated the new technology with our existing system.
- Tested and iterated on filtering algorithms to reduce location error from 4 meters to less than 1 meter.

Projects

AlphaFour Currently building a lightweight version of DeepMind's AlphaGo Zero algorithm to master the game of Connect Four through self-play with no initial knowledge.

Bayesian Optimiser Fourth-year capstone project. Developed a hyperparameter tuner using Bayesian optimization for a local fintech company to improve model performance and streamline workflows.

Atari Pong RL Term project for a masters level course in deep learning taken while on exchange in Copenhagen. Developed reinforcement agent to play Pong using a novel approach.

Autonomous Robot Built an autonomous robot that uses a version of the YOLO object detection algorithm running on a Raspberry Pi to navigate towards and retrieve targets on a complex and dynamic course.

More info on the projects above and all the projects that I didn't have room for can be found at my website: ***bholmes.ca***

Education

B.ASc Engineering Physics
Sep 2016 - Apr 2022 (Expected)
University of British Columbia
Vancouver, BC

Course work includes: Object-oriented programming; linear algebra; probability; complex analysis; applied differential equations; computational physics; game theory; experimental design; technical communication.
Cumulative average: 80.4%

Exchange Semester
Sep 2019 - Dec 2019
Technical University of Denmark
Copenhagen, DK

Courses taken: Deep Learning; Computationally Hard Problems; Robotics; Computational Multibody Dynamics.