

# Ben Holmes

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## Skills

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<b>Programming</b>	Strong Python and Java developer. Experience with SQL, C/C++, JavaScript, MATLAB, and R.
<b>Deep Learning</b>	Experience implementing LSTMs, CNNs, GANs, and reinforcement learning models in PyTorch, TensorFlow, Keras, and MXNet. Strong understanding of the underlying math.
<b>Data Science</b>	Data exploration and cleaning, feature engineering, large datasets, written and verbal communication. Regressions and machine learning models. Skilled in Pandas, Dask, and Sklearn.

## Experience

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<b>Quantitative Analyst Co-op</b> Castleton Commodities	May - Aug 2019 Calgary, AB
<ul style="list-style-type: none"><li>• Used Python and Dask to perform data exploration on a large (over 100GB) dataset to verify industry priors about freeze-offs — a poorly understood but crucial factor in the price of natural gas markets.</li><li>• Developed, trained, and validated machine learning models using Python and Scikit Learn to predict natural gas production as a function of multiple variables.</li><li>• Documented research process and results, and presented my findings to the data science and trading teams.</li><li>• Wrote Python script to process trade tick data into daily indexes that were more accurate than the ones given by the exchanges.</li></ul>	
<b>Software Developer Co-op</b> Blue Willow Systems	Jan - May 2018 Vancouver, BC
<ul style="list-style-type: none"><li>• Researched emerging localization technologies and wrote Python algorithms for a proof of concept that integrated the new technology with our existing system.</li><li>• Tested and iterated on filtering algorithms to reduce location error from 4 meters to less than 1 meter.</li><li>• Implemented front-end, back-end, and SQL database changes to production web and mobile applications which added new features including an incident report system and a company-wide announcements board for customers.</li><li>• Wrote a custom Android application that used bluetooth to showcase company technology during sales meetings when the full, cloud-based system could not be installed.</li></ul>	

## Projects

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<b>NN from Scratch</b>	Implementing a fully connected neural network from scratch in Python using Numpy.
<b>WikiBot</b>	Parsed a Wikipedia data dump and created a directed graph as a SQL table to represent links between pages. Wrote a bot that uses Selenium to play an online game where players race between two random Wikipedia pages by following links in the articles. Regularly scores 5-10x higher than its human opponents.
<b>Autonomous Robot</b>	Built an autonomous robot capable of navigating a complex course and retrieving stuffed animals along the way. Deployed an object localization algorithm on a Raspberry Pi to detect the stuffed animals and navigate the robot towards them.

*More info on the projects above, as well as all my other projects and experiences, can be found at my website: [bholmes.ca](http://bholmes.ca)*

## Education

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<b>B.ASc Engineering Physics</b> University of British Columbia	Sep 2016 - Apr 2021 (Expected) Vancouver, BC
<p><b>Course work includes:</b> Mechanical design and analysis; analog circuits; signals and systems; object-oriented programming; linear algebra; complex analysis; electricity and magnetism; technical communication; sustainable design.</p> <p><b>Cumulative average:</b> 80.2%</p>	
<b>Exchange Semester</b> Technical University of Denmark	Sep 2019 - Dec 2019 Copenhagen, DK
<p><b>Courses taken:</b> Deep Learning; Computationally Hard Problems; Robotics; Computational Multibody Dynamics.</p>	