

FLAWNSON TONG

I'm an 19 year old student at the University of Waterloo who's passionate about the use of A.I in the discovery and optimization of new molecules.

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SKILLS

- **Programming and Development:** Proficient in Python, HTML, CSS. Familiar with Javascript and C++. Proficient with VSCode, Google Colab, Jupyter. Main libraries used include Numpy, Scipy, and Pandas.
- **Machine Learning and Data Science:** Proficient in Keras, Pytorch, SciKit-learn, Excel. Familiar with Tensorflow, Matplotlib, Jupyter, Google Cloud Services, RDKit, and Visdom. Experienced with Openbabel, NLTK, OpenCV.
- **Entrepreneurial and research** Proficient at Photoshop, deck-building, presentations, pitches, networking, and research. Experienced with Microsoft office Suite, Google Suite, and Tableau.

EXPERIENCE

Research Assistant | Globus Labs - University of Chicago

May 2019 - Present

- Filtered data and facilitated testing incoming datasets on benchmark machine learning models.
- Built data pipeline to extract molecular coordinates and energies from open source dataset.
- Researched and built POC for transfer learned NNP featurizer for graph convolution network.

Front End Developer Intern | CIBC Digital Live Labs

Jun. 2018 - Sept. 2018

- Designed interface with Initial user experience (with InVision) testing at and 89% completion rate.
- Developed tutorial to Increase customer engagement of travel rewards points by 2x as projected in guerilla tests.
- Calculated to save CIBC approximately \$130 CAD worth of points per user on average.

PROJECTS

Generating novel molecules with an LSTM trained on SMILE string representations

- Developed in Python, built with Keras, used Google Collab and Google Cloud GPU Services to reduce training time to generate a subset of candidate molecules, 40% of which were valid.
- Formatted, normalized, and preprocessed unlabelled dataset of 250,000 unique molecules, used non-cannonical SMILE strings to augment final dataset, divided into 3 and cross-validated with k-fold.

Evolutionary neural network for classifying HIV octomers with automated hyperparameter optimization.

- Developed in Python, built with PyTorch, achieved 93% accuracy on a test set of 300 octomers.
- Integerized, padded, and formatted labeled dataset of over 3000 unique octomers.
- Used evolutionary algorithm to automatically optimize hyperparameters, increasing efficiency by at least 2x.

Graph convolutional network with edge features for spatio-temporal urban traffic forecasting

- Researched Graph learning techniques for supervised directed edge regression methods and built POC.
- Preprocessed dense temporal graph of over 1200 nodes and 1.2M edges, with 29 features per node and 25 features per edge over a 2 year span.
- Researched use of unsupervised embedding with graph convolutions, implemented new methods on top of PyTorch.