

# JOHN ZHANG

Toronto, Ontario · johnzhanguoft@gmail.com · john-zhang-uoft.github.io · github.com/john-zhang-uoft

## SKILLS AND LANGUAGES

---

Programming Languages: C++, C#, Python, ARM Assembly, Verilog, C, Javascript, HTML, CSS, MATLAB  
Tools: Bash (Linux), Git (source control), Visual Studio and VSCode, JetBrains IDEs  
Languages: English, French, Chinese

## WORK EXPERIENCE

---

### **Rocscience Inc.**

*Software Developer Intern*

Toronto, Ontario  
May 2022 - August 2022

- Used Unreal Engine 4 and C++ to create an augmented reality interactive scene and results viewer for 3D geotechnical models.
- Made C++/CLI wrapper for unmanaged geometric C++ libraries for use in software built with C#.
- Designed and developed own geometric algorithms in C++ to fix meshes through constructing a signed distance level set voxel grid.
- Unit tested sections of my code with C# to verify accuracy.

### **The Matter Lab**

*Undergraduate Researcher*

University of Toronto, Toronto, Ontario  
September 2021 - August 2022

- Developed bash scripts to automate physical chemistry calculations and data preprocessing for machine learning tasks.
- Created datasets of chemical surface features from existing computational chemistry datasets.
- Adapted Pytorch classes and Geometric Deep Learning models from scientific literature to the dataset and trained supervised Neural Networks to predict chemical properties.

### **Rocscience Inc.**

*Software Developer Intern*

Toronto, Ontario  
May 2021 - August 2021

- Designed, created, and presented a cross-platform 3D model viewer with 2 teammate using the Electron framework and Vue.js.
- Developed algorithms in C# designed to parse 3D mesh elements features in the RS3 software and improved performance of previous algorithm by more than 1000%.
- Trained and evaluated a machine learning model with Tensorflow for predicting structural convergence of 3D finite-element mesh models.
- Analyzed time complexity of algorithms and optimized algorithms for speed and memory usage.

## PROJECTS AND AWARDS

---

### **Hack the North Winner** *September 2021*

<https://devpost.com/software/studdybuddy-wvsn2>

Won Hack the North 2021 with 3 teammates. Employed Google Cloud Vision to create a Chrome extension that allows users to select text in videos by locating text and overlaying HTML elements.

### **Neural Network Library** *July 2021 - August 2022*

<https://github.com/john-zhang-uoft/NeuralSharp>

Created a fully native C# feed-forward neural network library. Implemented gradient descent with vectorized backpropagation. Features include dense layers, dropout layers, various optimizers, stochastic gradient descent, and data encoding. Employs object-oriented design. Implemented a Deep Neural Network for classification and a basic Generative Neural Network for handwritten digits.

### **National Undergraduate Big Data Challenge Outstanding Science Communication Winner** *May 2021*

<https://stemfellowship.org/undergraduate-big-data-challenge-2021/>

Worked with 3 teammates using various statistical methods to analyze twitter communities and misinformation on COVID-19 related tweets. Used dimension reduction techniques such as PCA and t-SNE, regression analysis and network algorithms. Wrote a scientific manuscript and video presentation detailing methods and results.

## EDUCATION

---

### **University of Toronto**

Bachelors of Applied Science in Engineering Science

Toronto, Ontario  
September 2020 - April 2025