

SKILLS SUMMARY

- **Software** C++ Python PyTorch MATLAB C# Git SQL CUDA Unix
- **Prototyping** SolidWorks Arduino Eagle Houdini
- **App. Dev** JQuery HTML5 CSS Jekyll Drupal Android Studio
- **Management** Systems analysis Development models Agile methods JIRA GitLab
- **Laboratory** Plastic and polymer processing at University of Michigan

WORK EXPERIENCE

01/2019 - Present **3D Software Developer** | *Side Effects Software*

Demo created for Houdini 17.5 launch: <https://youtu.be/w-8qrehON8Q?t=3277>

- Initiating and designing for machine learning integration in SideFX Houdini and PDG pipeline tools
- Design analysis and rapid prototyping on node-based descriptions of machine learning architecture
- Developed a terrain generation network using a UNet generator in a generative adversarial network to map 2D sketches to real-world heightfields representing terrain data extracted from the USGS database
- Created and tuned a simulated erosion machine learning model on high-resolution synthesized terrains to achieve accurate similarities (>95% SSIM) at 50,000x faster than standard VFX methods
- Leveraging Pytorch and Libtorch C++ to develop scaleable and diverse pipelines in Houdini

04/2018 - 08/2018 **Content Editor and Themer** | *Ontario Institute for Cancer Research*

- Developed scalable and manageable websites through leveraging dynamic HTML, CSS, JQuery, and React within Jekyll architectures. Improved existing websites through refactoring at the architecture level
- Created websites by implementing design components using InVision and OmniGraffle, and transitioning to management to convert the designs into appropriate workflows and tasks for the development team

RESEARCH EXPERIENCE AND PROJECTS

09/2018 - Present **Undergraduate Research Assistant** | *Vision and Image Processing Group, University of Waterloo*

- Working with graduate students to amplify adversarial attack performance via interpretability techniques
- Experimenting with modern architectures such as ResNet50, VGG16, and GoogleNet to study the effects of masking various forms of adversarial noise with saliency maps to produce unrecognizable perturbations
- Developed PyTorch pipeline to enhance perturbations with masks, and visualize and quantify comparisons

08/2018 - Present **Research and Development Engineer** | *Esperto Labs (Student Design Team)*

- Assisting in the creation of a user-friendly wearable platform for biometric data collection
- Developed an efficient step detection algorithm in C; rapid prototyping on a SAMD21 and a MPU9250

Generalizable Reinforcement Learning Project

- Developed a scalable deep reinforcement learning framework based on OpenAI's gym environments
- PyTorch implementation of modular DQN, Double DQN, Duel, and PER to optimize agent architectures

EDUCATION

2017 - Present **Candidate for Bachelor of Applied Science - Biomedical Engineering** | *University of Waterloo*

- 4.00 GPA - Shad Memorial Engineering Scholarship, Lau Engineering Scholarship, First in Class Scholarship

09/2018 - Present **Teaching Assistant** | *University of Waterloo*

- Teaching assistant for calculus in Systems Design Engineering; large-scale sessions and individual tutoring

INTERESTS/HOBBIES

Interests Medical imaging Medicine Machine Learning Deep Learning Visual Effects

Hobbies Guitar Soccer Saxophone Cooking Game Dev. Online courses (Coursera)