SHUHAO LI

3327-68 Corporate Dr, Scarborough, ON M1H 3H3, CA
647-849-8010 me@shuhaoli.page github.com/Shuhaoalex shuhaoli.page

Education

University of Toronto **Sep. 2016 – Jun. 2021**
Honours Bachelor of Science with High Distinction – Computer Science Specialist *Toronto, Ontario, Canada*

- Focusing on Artificial Intelligence, Computer Vision, and Scientific Computing
- cGPA:3.88/4.0 (First year: 3.82; Second year: 3.83; Third year: 3.87; Fourth year: 3.88)

Awards

Innis College Exceptional Achievement Award ($625) 2018 Fall

Dean's List Scholar 2018 Winter

Dean's List Scholar 2021 Winter

Research Interests

- High Performance Computing
- Machine Learning
- Artificial Intelligence
- Computer Vision
- Computer Graphics
- Robotics

Skills

Programming Languages: Python, C, C++, Java, JavaScript, SQL, MATLAB, Bash, Latex, HTML
Operating Systems: Linux, Windows
Frameworks/Libraries: TensorFlow, Pytorch, Eigen, OpenCV, Scipy, OpenMP, MPI
Version Control: TortoiseSVN, Git

Relevant Courses

Note: Courses with a CSCXXX/XXXX designation are cross-listed as both undergraduate and graduate.

- CSC417/2549: Physics-based Animation
- CSC418/2504: Computer Graphics
- CSC421/2516: Neural Networks and Deep Learning
- CSC456/2306: High-Performance Scientific Computing
- CSC411/2515: Machine Learning and Data Mining
- CSC420: Introduction to Image Understanding
- CSC384: Introduction to Artificial Intelligence

Working Experience

Noah's Ark Laboratory, Huawei Technologies Canada **May 2019 – Aug. 2020; Aug. 2021 – Now**
Support Engineer *Markham, Ontario, Canada*

- Develop Android demos for showcasing the algorithms developed the team.
- Attend team research meetings and share the papers I have read with each other.
- Lead the development of a paint color estimation method that has been patented (U.S. Patent Application Serial No. 16953029).
- Currently participating in the development of an eye tracking algorithm.

University of Toronto Scarborough **Sep. 2020 – Jan 2021**
Teaching Assistant of Introduction to Programming (CSCA20) *Scarborough, Ontario, Canada*

- Held tutorial sessions based on the material provided by the course instructor.
- Graded students' assignments and exams.
- Held office hours for answering students' questions.

Research Experiences and Projects

Deep Neural Network Compression Using Structured Regularization | *Python, TensorFlow* **May 2019**

Supervised by Professor Maryam Dehnavi

- Developed a new structured regularization term that can help shrink the size of layers in the network during training, and the idea is inspired by Wen et al.
- Researched how structured sparsity of neural networks' weights would help to speed up the inference speed of the network. Other 6 papers were reviewed during this step.
- Conducted experiments on the MNIST data set, the regularization term was able to shrink the test model's size by more than 20% with only 1% loss in the training accuracy.

Smartphone-based Paint Color Estimation Method | *C++, Java, Android* **May 2020**

- Created a data collection app on smartphone using the Camera2 API of Android, and built a database containing information for more than 300 paints with the help of this app.
- Invented a method and built a corresponding model used for estimating the RGB value of paints' colors. The entire measuring procedure can be done with a smartphone only.
- Implemented a algorithm that can reconstruct real-world objects' geometries in real time using the ToF camera on the smartphone.
- Implemented a Android app running method for demonstrating the final result.

Stabilized Neural Subdivision | *Python, TensorFlow* **Sep. 2020**

Supervised by Professor Alec Jacobson

- Re-implemented the code base of Neural Subdivision paper using TensorFlow.
- Formed a hypothesis that normalizing the size of a mesh with the mesh's average edge length may help to solve the instability problem mentioned in the original paper.
- Extracted the fundamental operators from the paper's model and reformed them into convolution and pooling operators that can be widely used on 3D meshes.

Particle Based Fluid Simulation | *C++, OpenMP, Eigen* **Nov. 2020**

- Implemented the particle based fluid simulation algorithm presented by *Clavet et al* in paper *Particle-based Viscoelastic Fluid Simulation*.
- Implemented space partitioning to improve the efficiency of the algorithm.
- Use Eigen library and OpenMP to speed up the algorithm.

Image Inpainting | *Python, Tensorflow* **Nov. 2020**

- Developed a image inpainting algorithm based on paper *EdgeConnect: Generative Image Inpainting with Adversarial Edge Learning* by *Kamyar et al* and paper *Free-Form Image Inpainting with Gated Convolution* by *Jiahui et al.*
- Using Tensorflow to implement and train the model we built.

Patents

A mechanical lock that can be rotated freely without getting unlocked when a wrong key is presented
Patent No. ZL 2015 1 0442405.5 **2017**

Method, System, and device for color measurement of a surface
U.S. Patent Application Serial No. 16953029 **2020**

Volunteer / Extracurricular

HER CODE CAMP **Sep 2020**

Mentor

- Provided a basic introduction to Computer Science to high school female students.
- Instructed mentees for developing a pong game.
- My group won the "Most Popular" prize.