

Xiaoji (Joy) Zhang

CV for Computer Science Department

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Interests

- **Research:** Computer Graphics, Physics-Based Animation, Geometric Modeling and Processing, Scientific Computing, Real-Time/Offline Rendering, Applied Machine Learning
- **Personal:** Interactive Media Art, Painting, Photography, Writing

Education

Academic Qualifications.....

- **University of Waterloo** **Waterloo, ON**
Bachelor of Mathematics, Computer Science (Fine Arts option) and Statistics 2014 – 2019
Cumulative Average: 90.3/100 GPA: 3.92/4.00

Research

- **Computational Motion Group** **University of Waterloo**
Undergraduate Research Assistant Jan 2018 – Present
 - Working with **Prof Christopher Batty** on computational geometry and mesh processing projects for applications in fluid simulation and animation.
 - Extending the 2D mesh-based surface tracking code to multiple materials.
 - Experimenting with tetrahedral mesh generation using the acute C15 lattice which theoretically produces state-of-the-art mesh quality, designing and implementing marching tetrahedra and isosurface stuffing algorithms for C15.
- **Machine Learning Lab** **University of Waterloo**
Undergraduate (Summer) Research Assistant Jan 2017 – Dec 2017
 - Worked with **Prof Pascal Poupart** on conversational agents and theoretical machine learning projects.
 - Assisted the implementation of a Sum Product Network (SPN) library in Pytorch, designed and experimented with SPN language models.
 - Developed a conversational agent using **nonparametric memory networks** for online transfer learning.

Work Experience

- **Ubisoft** **Toronto, ON**
3D Programmer Intern May 2018 – Aug 2018
 - Worked closely with fellow R&D team members and technical artists on an unannounced AAA title, designed and created various rendering features using C++ (DirectX) and HLSL.
 - Implemented a compute-shader based bloom effect algorithm.
 - Developed real-time analytic approximation of polygonal and spherical area lights with the Disney BRDF.

- **FutureAdvisor (BlackRock)**
Algorithms Research Intern

 - Prototyped a validation model for the optimization algorithm used to automate portfolio management, built a frontend to display validation outcomes.
 - Performed impact analysis and wealth projection visualization for changes to the Monte Carlo simulation model, presented reports to business partners.
 - Implemented a build automation tool for versioning Docker database images.

San Francisco, CA
May 2017 – Aug 2017
- **theScore**
Ruby Developer - eSports

 - Researched and implemented GraphQL endpoints with caching and batch-loading data functionalities, used extensively by frontend engineers.
 - Extended database and API endpoints using dynamic routing to feature news and match results of Call of Duty, Street Fighter and Smash Bros.
 - Designed and built infrastructure for Korean data ingestion from external APIs.

Toronto, ON
Apr 2016 – Aug 2016
- **Intellisoft Development**
Junior Developer

 - Refactored internal Apache Solr search, increased speed by 4 times.
 - Designed and built responsive pages for the **George Brown College website**.

Toronto, ON
Sept 2015 – Dec 2015

Projects

- **Computer Graphics course project: 'Red Currant Jelly'**

A raytracer that reproduces Mary Pratt's masterpiece, 'Red Currant Jelly'. Implemented numerous rendering features including photon mapping, glossy reflections and refractions, texture and normal mapping, soft shadows, and Phong shading.
- **Statistical Learning course project: 'Quora Question Pairs'**

Top 27% in the Kaggle competition regarding the natural language processing (NLP) problem of identifying duplicate questions on Quora. Experimented with attention based convolutional neural networks (ABCNNs) and authored project report.
- **Data Visualization course project: 'Image Super Resolution'**

A computer vision project on perceptually effective super resolution models. Experimented with Super Resolution Convolutional Neural Networks (SRCNNs) and Generative Adversarial Networks (SRGANs). Authored project report.
- **Hack the North 2016 project: 'Looprac'**

A carpool matching web application that allows drivers and passengers to find each other easily. Built the data API and user authentication service using Ruby on Rails.
- **Mathematical Contest in Modelling 2014 problem: 'People's Choice of Best Coach'**

A 3-day project for the Mathematical Contest in Modelling. Built decision models using Analytic Hierarchy Process, and prediction models using Neural Networks. Authored project report. Received the Honorable Mention Prize.