

Joy (Xiaoji) Zhang

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Interests

- **Research Interests:** Computer Graphics, Physics-Based Animation, Geometric Modeling and Processing, Computational Fabrication, Human-Computer Interaction

Education

- **Cornell University** **Ithaca, NY**
PhD in Computer Science *2019 – Present*
Advisor: Steve Marschner
Teaching Assistant: Intro to Computer Graphics & Computer Graphics Practicum (Fall 2019, Fall 2020)
- **University of Waterloo** **Waterloo, ON**
Bachelor of Mathematics, Computer Science (Fine Arts option) and Statistics *2014 – 2019*
Cumulative Average: 90.2/100 GPA: 3.92/4.00

Publications

- **Weavecraft: An Interactive Design and Simulation Tool for 3D Weaving**
Rundong Wu, **Joy Xiaoji Zhang**, Jonathan Leaf, Xinru Hua, Ante Qu, Claire Harvey, Emily Holtzman, Joy Ko, Brooks Hagan, Doug James, François Guimbretière, and Steve Marschner.
ACM Transactions on Graphics (SIGGRAPH Asia 2020). To appear.
- **Automatic structure synthesis for 3D woven relief**
Rundong Wu, Claire Harvey, **Joy Xiaoji Zhang**, Sean Kroszner, Brooks Hagan, and Steve Marschner.
ACM Transactions on Graphics (SIGGRAPH 2020), Volume 39 Issue 4, August 2020.

Research

- **Graphics and Vision Group** **Cornell University**
Graduate Research Assistant *Aug 2019 – Present*
Working on cloth simulation and its application to the computational design and fabrication of 3D woven-textiles.
- **Computational Motion Group** **University of Waterloo**
Undergraduate Research Assistant *Jan 2018 – Apr 2019*
Worked with **Prof Christopher Batty** on geometric modelling and mesh processing projects for applications in fluid simulation and animation. Extended the 2D mesh-based surface tracking algorithm to multiple materials. Also designed and implemented isosurface stuffing algorithms for the acute C15 lattice which theoretically produces state-of-the-art mesh quality.
- **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, as well as an **augmented sequence-to-sequence network** with progressive key-value memory banks, to address the problem of incremental domain adaptation (IDA) for conversational agents.

Industry Experience

- **Adobe** **Seattle, WA**
Creative Technologies Lab Intern *May 2020 – Aug 2020*
 - Developed a sketch-based authoring interface for secondary dynamic effects, currently working towards a publication.
- **Ubisoft** **Toronto, ON**
3D Programmer Intern *May 2018 – Aug 2018*
 - Worked closely with fellow R&D team members and technical artists on *Watch Dogs: Legion*, designed and created various rendering features using C++ (DirectX) and HLSL.
 - Implemented a compute-shader based bloom effect algorithm with improved efficiency and accuracy.
 - Developed real-time analytic approximation of polygonal and spherical area lights with the Disney BRDF.
- **FutureAdvisor (BlackRock)** **San Francisco, CA**
Algorithms Research Intern *May 2017 – Aug 2017*
 - 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, which smoothed the onboarding process for all engineering teams.
- **theScore** **Toronto, ON**
Ruby Developer - eSports *Apr 2016 – Aug 2016*
 - Led the research and implementation of 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.

Projects

- **Red Currant Jelly** <http://xiaojizhang.com/files/ray-tracer.pdf>
A ray tracer 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.
- **Quora Question Pairs** <http://xiaojizhang.com/files/quora-question-pairs.pdf>
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.
- **Image Super Resolution** <http://xiaojizhang.com/files/image-super-res.pdf>
A computer vision project on perceptually effective image super resolution models. Experimented with Super Resolution Convolutional Neural Networks (SRCNNs) and Generative Adversarial Networks (SRGANs). Authored project report.