Yuting Yang

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Ph.D. Student at Princeton University

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My research interests are in the intersection of computer graphics, computer vision, machine learning and programming language. Specifically, My research is focused on using compiler techniques to help easy manipulation and fast prototyping for general computer graphics and vision programs.

Technical Skills

Tools and Languages	TensorFlow, PyTorch, CUDA, Halide, GLSL, Python, C/C++, MATLAB
Research Area	Computer Graphics, Computer Vision, Machine Learning, Deep Learning, Programming Language

Education

Princeton University **Sept 2018 — Present**
Ph.D. Student in Computer Science , Advisor: Adam Finkelstein Princeton, NJ

University of Virginia **Aug 2015 — May 2018**
Enrolled in Ph.D Program, Computer Science , Advisor: Connelly Barnes Charlottesville, VA

University of Pennsylvania **Aug 2013 — May 2015**
M.S., Electrical Engineering , Advisor: Daniel D. Lee and Camillo J. Taylor Philadelphia, PA

Huazhong University of Science and Technology **Sept 2009 — June 2013**
B.S., Electronics and Information Engineering Wuhan, P.R.China

Professional Work Experience

Adobe Research **Feb 2021 — Apr 2021**
Research Intern , Collaborators: Connelly Barnes and Andrew Adams

- Develop math rules for differentiating discontinuous programs and implement a reverse mode back-propagation framework.
- Reconstruct program representation for real-world icons and enable easy animation/manipulation in GLSL.

Adobe Research **May 2022 — Aug 2022**
Research Intern , Collaborators: Connelly Barnes and Zeyu Jin

- Build gradient-based optimization pipeline for musical synth by adapting inverse rendering gradient rules to audio.
- Reproduce real-world musical instrument signals using simple synth programs.

Educational Experience

Princeton University
Graduate Research Assistant

- Research on automatic differentiation to discontinuous programs with application to shaders.
- Research on augmenting deep learning input data with program trace.
- Collaborate on using neural proxies to approximate and optimize black box programs/filters.

University of Virginia
Graduate Research Assistant

- Research on automatic convolution to shader programs using mean-variance statistic.
- Research on automatic program translation from python to optimized C for vision and graphics programs.

Publications

[1] **Yuting Yang**, Connelly Barnes, Andrew Adams, Adam Finkelstein. Aδ: Autodiff for Discontinuous Programs - Applied to Shaders. **SIGGRAPH 2022**
[2] **Yuting Yang**, Connelly Barnes, Adam Finkelstein. Learning from Shader Program Traces. **Eurographics 2022** (Best Paper Award)
[3] Ethan Tseng, Felix Yu, **Yuting Yang**, Fahim Mannan, Karl St. Arnaud, Derek Nowrouzezahrai, Jean-François Lalonde, Felix Heide. Hyperparameter Optimization in Black-box Image Processing using Differentiable Proxies. **SIGGRAPH 2019**
[4] **Yuting Yang**, Connelly Barnes. Approximate Program Smoothing Using Mean-Variance Statistics, with Application to Procedural Shader Bandlimiting. **Eurographics 2018**
[5] **Yuting Yang**, Sam Prestwood, Connelly Barnes. VizGen: Accelerating Visual Computing Prototypes in Dynamic Languages. **SIGGRAPH Asia 2016**
[6] **Yuting Yang**, Camillo J. Taylor, Daniel D. Lee. Intersection monitoring from video using 3D reconstruction. **ITS International January February 2016**

Service

Reviewer for: TPAMI (2021), SIGGRAPH Asia (2019), IEEE BMSB (2018), Pacific Graphics (2018).