Sam Sartor

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Sam works on nasty graphics problems at William & Mary, when not playing fiddle music or skiing.

Education

Colorado School of Mines *Aug 2015 — Dec 2018*
B.S. in Computer Science
Minor in Applied Mathematics

William & Mary *Aug 2021 — Present*
M.S. in Computer Science *Jun 2023*
Ph.D. in Computer Science *est. 2026*

Skills

Graphics Research | Deep Learning in PyTorch | Diffusion Models | 3D Reconstruction | Rust/C++ Systems Programming | Frontent Development | Programming Language Design | Project Leadership

First-Author Publications

Content-aware Tile Generation using Exterior Boundary Inpainting
ACM Transactions on Graphics, Volume 43
SIGGRAPH Asia, Dec 2024
I presented a simple yet novel method for generating sets of tiles from photographs or text prompts. Instead of copying patches of the input image to form the tiles as in prior methods, I leveraged the prior knowledge of natural images and textures embedded in pretrained diffusion models to create fully unique tiles. I also developed dual tiling, an improvement on the classic Wang tile scheme which can better support complex image content.

MatFusion: A Generative Diffusion Model for SVBRDF Capture
SIGGRAPH Asia, Dec 2023
I formulated the problem of SVBRDF estimation from photographs as a diffusion task. I first collected a dataset of 312,165 material exemplars from various online sources, and used them to train an unconditional diffusion model. Then I finetuned three conditional diffusion models to estimate material properties from various types of photographs under different lighting, with training data rendered in Blender. Under colocated flash lighting, my method achieved equal or better accuracy as compared to SVBRDF estimation methods available at the time.

Work

Teaching/Research Assistant — William & Mary *Aug 2021 - Present*
I taught 6 lab sections of the introduction Python course, and have continued mentoring an undergraduate researcher. Now I work as full-time research assistant in graphics with Dr. Pieter Peers.

Senior Software Engineer — SketchUp — Trimble Inc. *Jan 2019 – Jul 2021*
Lead developer on the SketchUp for Web project, shipping a C++ core on the web via WebAssembly. I also prototyped WebVR integration & pointcloud-based 3D warehouse search.

Other Projects

Hornpipe — Reactivity for Rust *Open-source project, Jan 2020 — Present*
Work-in-progress transactional memory system, weak reference garbage collector, and dataflow system for Rust. Provides robust undo/redo and a Svelte/VueJS-like development experience.

HypAR Map *Project at the Facebook Global Hackathon Finals, Nov 2018*
Team of four won 1st place with an indoor navigation app. I wrote the solver for map position/rotation/scale using the orientations of visible walls. Idea to demo in less than 24 hours!

Disjoint Captures *Rust language RFC, Nov 2017*
I proposed the improvement to capturing of struct fields by closures implemented in Rust 2021.