Sam Sartor

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Education

William & Mary *Aug 2021 - May 2026*
Ph.D. in Computer Science *May 2026*
M.S. in Computer Science *Jun 2023*

Research assistant for Dr. Pieter Peers. Working primarily on techniques for controlling image diffusing models, for use in computer graphics. Course projects included a CUDA-like compiler for RISC-V vector instructions, a Wasm extension using CHERI capabilities, and some applications for human/object pose estimation.

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

Graduated Magna Cum Laude. Electives included computer graphics, information security & privacy, high performance computing, artificial intelligence, computer simulation, computational linear algebra, and abstract algebra.

Publications

Teamwork: Collaborative Diffusion with Low-rank Coordination and Adaptation
SIGGRAPH Asia, Dec 2025
I introduced a unified solution for jointly increasing the number of input and output channels of pretrained diffusion models, achieving state-of-the-art on tasks such as reflectance estimation and intrinsic decomposition. The solution is a novel variation of Low Rank-Adaptation (LoRA) which jointly addresses both adaptation and coordination between many copies of the backbone model.

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 was the first to formulate the problem of SVBRDF estimation from photographs as a diffusion task. I 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.

Yield Closures *Aug 2020*
I authored a proposal to introduce fully generalized coroutines into the Rust programming language in order to improve the user experience of creating iterators, streams, sinks, push-down parsers, state machines, etc. Although postponed, it led to the authoring of a design document to explain in detail the considerations and trade-offs of various coroutine proposals.

Disjoint Captures *Aug 2018*
I proposed the improvement to capturing of struct fields by closures implemented in Rust 2021.

Work

Graduate Research Scientist – Adobe Research *Jun 2026 - Present*
Ongoing work with image generation and editing diffusion models.

Research Scientist Intern – Adobe Research *Jun 2025 - Sept 2025*
Investigation into prompt-free image editing techniques with the latest generation of image diffusion models. Mentored by Valentin Deschaintre, Michael Fischer, and Iliyan Georgiev.

AI Engineer Consultant – Start9 *Jun 2023 - Aug 2023*
Ported some generative AI applications to Start9's Embassy platform, and advised future platform development.

Teaching/Research Assistant – William & Mary *Aug 2021 - May 2026*
Worked as full-time research assistant in graphics with Dr. Pieter Peers. I also taught 6 lab sections of the introduction Python course, and mentored an undergraduate researcher.

Senior Software Engineer – SketchUp – Trimble Inc. *Jan 2019 - Jul 2021*
Lead developer on the SketchUp for Web project: a C++ desktop application for 3D modeling ported to WebAssembly and integrated deeply with a Typescript/VueJS frontend. I worked closely with our product lead to design and release new features. Examples include the command pallet, node-based modeling tools, cross-platform settings sync, new settings panel, Google Drive and OneDrive integration, and trackpad input mode. I also prototyped a WebVR interface, GLTF exporter, and a PointNet-based pointcloud search function.

Software Engineer Consultant – SALT Blockchain *Sep 2018 - Dec 2018*
Contracted to develop a Rust microservice for tracking risk and taking action in response to changing valuation of loans.

Software Engineer Intern – Pivotal Tracker – Pivotal Inc. *May 2017 - Aug 2017*
Contributed to Pivotal's flagship product including an optimized user search bar and new user management page.

Skills

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

Hackathons

SketchUp Web VR *Best Overall Project – SketchUp Internal Hackathon – Jul 2020*
Prototyped WebVR support in SketchUp for Web, to allow 3D model viewing on mobile and desktop VR devices. This project also required adding experimental stereographic rendering to the SketchUp graphics engine.

HypAR Map *1st – 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!

Datanium *Best Social Good Hack – MHacks 11 – Oct 2018*
Demonstrated a system for providing bulk media (movies, books, music) to communities without broadband internet, by coordinating a network of couriers with signed SMS messages.

Limber *2nd – Minnehack – Jan 2018*
A WebVR project to assist in low-cost physical therapy.

PARQYNG *1st – Xilinx Technology Showcase & Hackathon – Oct 2017*
Used a FPGA-equipped development board to sense cars entering and exiting a parking lot and track parking availability.

Projects

CheckpoinTUI *May 2025 - Present*
Terminal user interface for browsing the contents of safetensors, gguf, and pt checkpoint files. Provides the histogram and spectra (singular values) for selected tensors.

Gfxds.rs *Apr 2024 - Nov 2025*
High-performance dataloader for multi-image graphics datasets, written in Rust.

AsyncCell *Apr 2021 - Present*
Rust library providing a simple concurrent primitive which can replace more expensive channels in a fair number of cases. 800K downloads at time of writing.

Hornpipe *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.

Sidequest *Nov 2016 - Oct 2018*
Developed several different CUDA-accelerated, physically-based path tracers.

Christmas Festivities Mod *Oct 2012 - Jan 2015*
Popular series of Minecraft mods, the first predating modern modloaders (i.e. Bukkit, Forge). This is how I first learned OpenGL, and got interested in computer graphics!