

Anant Saraf

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EDUCATION

Brown | RISD Dual Degree Program GPA 3.98/4.0

Providence, RI | Expected Graduation May 2027

Brown University, *B.A. Computer Science*

Relevant Coursework: Intro to Computer Graphics, Computational Photography, Computer Vision, Deep Learning, Intro to Software Engineering, Linear Algebra, Discrete Structures and Probability

Rhode Island School of Design (RISD), *B.F.A. Photography*

EXPERIENCE

Undergraduate Teaching and Research Award, *Geospatial Object Detection Pipeline* **Providence, RI | June – Aug 2025**

- Designed and implemented an end-to-end SAR CV pipeline in Python (API GeoTIFF ingestion, preprocessing, inference, geospatial post-processing); packaged as a reproducible, config-driven workflow usable by non-technical domain experts.
- Fine-tuned YOLOv11 with SAHI sliding-window inference on a 3,000-image dataset (including null samples), achieving approximately 90% precision, 78% recall, and 83% mAP@0.5 on a held-out test set.
- Partnered with 2 domain experts to translate scientific objectives into dataset and modeling decisions; monitored training and created dataset curation tools to support iteration and handoff.

Joint Undergraduate-SRC Teaching Assistant, *Intro to Software Engineering (CSCI 0320)*

Providence, RI | Fall 2025

- Designed course material covering API development, socially responsible computing (SRC), software architecture, data validation, version control workflows, and agentic AI-assisted programming.
- Led weekly labs and office hours for 100+ students, mentoring teams, evaluating project progress in sprint demos, and providing actionable feedback to enhance learning outcomes.

JISIASR, *Medical Imaging Research Intern (Deep Learning)*

Kolkata, India | July 2024 – Sept 2024

- Developed a repeatable training and evaluation pipeline for lung segmentation on chest X-rays using U-Net variants, working under small-data and label-quality constraints.
- Ran controlled experiments on preprocessing and training choices (e.g., CLAHE, augmentations, early stopping) to reduce overfitting and improve validation behavior; compared U-Net variants and summarized results for handoff.
- Implemented a ResNet-50 classifier baseline and applied Integrated Gradients to probe model sensitivity and failure cases.

SELECTED PROJECTS

Realtime Graphics Renderer (*C++*, *OpenGL/GLSL*)

Providence, RI | Fall 2025

- Built an end-to-end real-time rendering pipeline and collaborated on a 4-person integration phase that merged independent subsystems into a unified codebase.
- Implemented GPU instanced rendering for repeated geometry, cutting per-frame render time from 800 ms to 0.015ms in a dense stress scene; benchmarked scalability by ramping instance counts and scene complexity.
- Implemented shading and post-processing effects including color grading, stylized filters, and multiple screen-space passes, and designed a custom LUT for the final scene.

RayTracer (*C++*)

Providence, RI | Fall 2025

- Built a ray tracing pipeline from scratch emphasizing geometric robustness: camera/ray generation, stable ray-primitive intersections, and a working lighting system.
- Reduced aliasing and texture artifacts with anti-aliasing and filtering; added hard shadows and bounded reflections to improve image quality.

Brown Course Review Webapp (*Java*, *Firebase*, *TypeScript*, *React*)

Providence, RI | Fall 2024

- Built a Java (Spark) HTTP API and Firebase data layer serving reviews for 2,700+ courses and 1,600+ professors.
- Wrote and maintained server unit/integration tests with 75-100% test coverage and conducted end-to-end testing using Playwright to ensure high reliability.
- Collaborated with a team of 4 on a scalable solution, optimizing API queries and data processing and retrieval for a concurrency-safe and user-centric application. ([GitHub](#))

Gaussian Splatting Pipeline (*Python*, *PyTorch*)

Providence, RI | Spring 2025

- Implemented a full 3D Gaussian Splatting training pipeline: defined model architecture, initialized and optimized fully differentiable parameters and trained the model end-to-end for 3D reconstruction.
- Built a mixed-precision PyTorch workflow on a High Performance Computing cluster, monitored over 58 hours of training, diagnosed and debugged numerical stability issues in differentiable rendering. ([GitHub](#))

HDR Imaging + Tone Mapping (*Python*, *NumPy*)

Providence, RI | Fall 2025

- Merged exposure-bracketed images into an HDR radiance representation and tone-mapped to preserve highlight/shadow detail on standard displays; implemented saturation-aware weighting to stabilize radiance-map reconstruction.

Technical Skills: C++, Python, Java, OpenGL/GLSL, NumPy, TensorFlow, PyTorch, React; Tools: Adobe Lightroom, Photoshop