Abhik Ahuja

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Education

University of Cambridge October 2023 - June 2024
Master's Advanced Computer Science.
Focus: Computer Graphics and Vision

University of California, Berkeley August 2019 - May 2023
B.A. Computer Science, Mathematics. GPA: 3.85/4.0
Focus: Computer Vision, 3D Reconstruction, Computational Imaging

San Joaquin Delta College August 2015 - May 2019
A.S. Mathematics. GPA: 3.95/4.0
Studied concurrently with high school. Earned 5 Associate degrees.

Research Experience

University of Cambridge October 2023 - Present
Advisors: Professor Rafał Mantiuk, Tianhao Wu, Fangcheng Zhong
Exploring relighting 3D Gaussian Splatting models using normal and BRDF prediction and using contrastive learning for video-to-video translation. Worked on text-guided editing of dynamic Neural Radiance Field (NeRF) models.

Berkeley AI Research Lab, (BAIR) July 2022 - September 2023
Advisors: Professor Angjoo Kanazawa, Matthew Tancik
Worked on text-to-3D generative models using NeRF and 2D Diffusion models for Nerfstudio, an open source Python NeRF repository with over 7k stars on GitHub and used by major industry players including Netflix, Lucasfilm, BBC, etc.

UC Berkeley SLICE Lab October 2020 - May 2022
Advisors: Professor Koushik Sen, Kevin Laeufer
Studied automatically repairing bugs in Verilog source code using SMT solvers. Wrote a pass for Berkeley's FIRRTL compiler in Scala to automatically repair logical loops in register transfer level (RTL) designs, enabling the automatic translation of Verilog circuit designs to FIRRTL.

Cornell, Maryland, Max Planck Pre-Doctoral Research School August 2021
Saarbrücken, Germany
One of 120 students worldwide selected to participate in CMMRS 2021, a week long program to expose students to computer science research and life as a researcher. Learned about topics in Deep Learning, Robotics, and Human Computer Interaction.

Industry Experience

Amazon — Software Development Engineer Intern May 2022 - August 2022
Seattle, WA
Designed and built automatic AWS deployment system, automating updates and enabling seamless product rollbacks for enhanced reliability and reducing deployment time by over 3x. Wrote custom software versioning infrastructure, expanding capabilities and optimizing the efficiency of the deployment process for 3rd party partners.

CDK Global — Software Engineering Intern June 2021 - August 2021
San Jose, CA
Developed an efficient web portal using React to provide a user-friendly interface and streamline interaction with software testing processes. Built a system to facilitate the execution of comprehensive software tests, ensuring reliability and quality of software before release and optimizing software testing workflow.

Publications

RTL-Repair: Fast Symbolic Repair of Hardware Design Code
Kevin Laeufer, Brandon Fajardo*, Abhik Ahuja*, Vighnesh Iyer, Borivoje Nikolic, Koushik Sen
Under submission to ASPLOS 2024.

Nerfstudio: A Modular Framework for Neural Radiance Field Development
Matthew Tancik*, Ethan Weber*, Evonne Ng*, Ruilong Li, Brent Yi, Justin Kerr, Terrance Wang, Alexander Kristofferson, Jake Austin, Kamyar Salahi, Abhik Ahuja, David McAllister, Angjoo Kanazawa
ACM SIGGRAPH, 2023.

Projects

- **Instruct-NeRF2NeRF4D**: Text-guided editing of 4D (dynamic) NeRF models. Uses iterative dataset updates by a 2D Diffusion model to gradually edit a dynamic NeRF.
- **CUT-Video**: Contrastive Unpaired Translation for Video-to-Video translation. Uses Generative Adversarial Networks (GANs) to translate image frames with an additional loss to encourage temporal consistency.
- **DiffGEM**: Diffusion guided editing of 3D GAN Models from a text prompt.
- **VR-NeRFs**: A virtual reality viewer for NVIDIA's Instant-NeRF library.
- **Linux System Administration**: Self host multiple services for personal use on personally owned and managed Linux server using Docker and Nginx.

Technical Skills

- **Skills**: Computer Vision, Graphics, Machine Learning
- **Languages**: Python, Java, Scala, C, C++, SQL, Javascript, Golang, OCaml, RISC-V, HTML, CSS, LaTeX
- **Libraries and Software**: PyTorch, SciPy, NumPy, Matplotlib, Linux, Docker, Flask, React

Relevant Coursework

University of Cambridge
- R255: Advanced Topics in Machine Learning
- L352: Advanced Graphics and Image Processing
- L335: Machine Visual Perception
- L314: Digital Signal Processing

UC Berkeley
- CS 294-173: Learning for 3D Vision
- CS 194-26: Introduction to Computer Vision and Computational Photography
- CS 184: Computer Graphics and Imaging
- CS 182: Deep Neural Networks
- CS 189: Introduction to Machine Learning
- CS 188: Introduction to Artificial Intelligence
- CS 170: Efficient Algorithms and Intractable Problems

Teaching

MATH 198: Introduction to Origami Art and Design	Fall 2022, Spring 2023
CS/INFO 198: Digital Privacy	Fall 2021, Fall 2022, Spring 2023
CS 170: Efficient Algorithms and Intractable Problems	Spring 2021
CS 70: Discrete Mathematics and Probability Theory	Summer 2020, Fall 2020

Awards

2023: Graduation with Distinction	UC Berkeley
2019 - 2023: Shiram Scholars	$1000 USD/year scholarship program
2019: Graduation with High Honors	San Joaquin Delta College

Leadership

Introduction to Origami Art and Design 2022 - 2023
Co-Founder of the student-led Origami course at UC Berkeley. Created and taught curriculum on origami folding practice, design principles, and mathematical connections.

Digital Privacy 2021 - 2023

Co-Founder of the student-led Digital Privacy course at UC Berkeley. Created and taught curriculum on privacy legislation and individual action surrounding personal privacy.

CAL Origami 2019 - 2023

President of the origami club at UC Berkeley. Planned and hosted the East Bay Origami Convention in Spring 2023 to support the San Francisco Bay Area origami community.