ABHINAV JAIN

1942 Westlake Ave, Apt 3006, Seattle, WA 98101

(917) 963 5372 ♢ abhinav@abhinav-j.com ♢ @abhinavj30 ♢ abhinavj30♢ abhinav-j.com

WORK EXPERIENCE

Amazon Prime Video **August 2020 – Present**
Applied Scientist II *Seattle, WA*

- Led content synthesis research in the Amazon Prime Video catalogue org, building ML and CV models to build new and delightful customer experiences.
- Researched photorealistic neural rendering of parametric human face and body models
- Led Prime Video's content synthesis for accessibility charter by proposing and working on projects such as 'Sign Language Avatar'.

Georgia Institute of Technology **August 2019 – May 2020**
Graduate Reserach Assistant *Atlanta, GA*

- Worked under Dr. Sonia Chernova on a human-robot collaborative manipulation project funded by Hitachi, Ltd.
- Used multi objective trajectory optimization to adapt robot trajectories for collaborative environments
- Created evaluation metrics and user studies for evaluation of adapted robot trajectories

Amazon Web Services **May 2019 – August 2019**
Applied Scientist Intern *Seattle, WA*

- Joined the AWS Sumerian AR/VR team working on innovative technologies for future products
- Worked closely with a Principal Research Scientist on a fiducial marker pose refinement problem
- Used a modified bundle adjustment problem with camera back-projection to stabilize marker pose in a video sequence

Georgia Institute of Technology **August 2018 – May 2019**
Head Graduate Teaching Assistant *Atlanta, GA*

- Lead Graduate Teaching Assistant for an introductory robotics and computer vision course
- Designed and graded labs and assignments
- Held office hours to assist students with course material

Société Générale **June 2017 – August 2017**
Summer Technology Analyst *New York, NY*

- Joined a front office team to develop tools and applications for daily use by stock traders
- Developed a web based automatic deployment system for the tools developed by the team
- Wrote a REST service in C# using the web API and front end in Angular2

Cooper Union IT Department **October 2016 – May 2018**
Student Manager *New York, NY*

- Managed the student-run computer center leading a team of 6 Supervisors and 40 Operators
- Delegated tasks for day-to-day running of the computer center to operators
- Assisted full-time IT staff with new software deployment
- Designed and implemented a new streamlined hiring process

Libsys Ltd. **May 2013 – August 2014**
Product Design Intern *New Delhi, India*

- Contributed to the concept and design of an e-commerce portal
- Took a workshop in Java Programming for Software Engineers
- Assembled and setup barebone servers for cloud portal

EDUCATION

Georgia Institute of Technology **August 2018 – July 2020**
Master of Computer Science *Atlanta, GA*

- Deep Learning
- Mobile Manipulation
- Computer Vision
- Robotic Motion Planning
- Computation Photography
- Intro to Graduate Algorithms
- Artificial Intelligence

The Cooper Union for the Advancement of Science & Art **September 2014 – May 2018**
Master of Electrical & Computer Engineering *New York, NY*

- Computer Vision
- Advanced Computer Architecture
- Design for Custom DSP Hardware
- Computer Graphics
- Artificial Intelligence
- Statistical Learning
- Machine Learning
- Design with Op Amps

The Cooper Union for the Advancement of Science & Art **September 2014 – May 2018**
Bachelor of Electrical & Computer Engineering *New York, NY*

- Digital Logic Design
- Digital Signal Processing
- Data Structures & Algorithms
- Software Engineering
- Computer Architecture
- Communication Theory
- Computer Security
- Computer Operating Systems

RESEARCH EXPERIENCE

Robotic Sculpting with a Multi-Axis Manipulator **January 2019 – July 2020**
Georgia Institute of Technology *Atlanta, GA*

- Worked under Dr. Frank Dellaert on a generalized solution for motion planning for robotic sculpting using a manipulator
- Used search based motion planning in voxel space to generate collision free trajectories for material removal
- Extended the project towards a M.S. Thesis in Computer Science

Adaptive Manipulation in Human-Robot Collaborative Manufacturing **August 2019 – May 2020**
Georiga Institute of Technology *Atlanta, GA*

- Worked under Dr. Sonia Chernova on trajectory adaptation for a human-robot collaborative manipulation project
- Used multi objective trajectory optimization to adapt robot trajectories for collaborative environments
- Created evaluation metrics and user studies for evaluation of adapted robot trajectories

3D Object Pose Refinement **August 2018 – March 2018**
Georgia Institute of Technology *Atlanta, GA*

- Worked under Dr. Frank Dellaert on a state of the art 3D object pose refinement system using RGB images
- Collaborated with a group from the Food Processing Technology Division to extend work to 6D pose estimation
- Results from experimentation on the YCB Video Dataset to be submitted to ECCV 2020 (see below)

Acceleration and Optimization of 3D Reconstruction Algorithms on GPUs **September 2017 – May 2018**
The Cooper Union *New York, NY*

- Researched GPU use in computer vision applications towards completion of thesis requirement for Master's
- Ported openCV 3D reconstruction algorithms to Nvidia CUDA code
- Optimized algorithm for faster execution

PUBLICATIONS

- Aggelina Chatziagapi *et al.* "LipNeRF: What is the right feature space to lip-sync a NeRF?" in *2023 IEEE Conference on Automatic Face and Gesture Recognition (FG 2023)*
- Avijit Vajpayee, *et al.* "A Simple and Efficient method for Dubbed Audio Sync Detection using Compressive Sensing." in *Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision 2023.*
- Abhinav Jain *et al.* "Anticipatory Human-Robot Collaboration via Multi-Objective Trajectory Optimization" in *2020 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2020).*
- Abhinav Jain. "Search-Based Collision-Free Motion Planning for Robotic Sculpting", thesis advised by Dr. Frank Dellaert *Georgia Institute of Technology* July 2020
- Abhinav Jain, Seth Hutchinson, and Frank Dellaert. "Robotic Sculpting with Collision-free Motion Planning in Voxel Space" arXiv preprint arXiv:1911.07348 (2019).
- Abhinav Jain and Frank Desllaert. "Fast 3D Pose Refinement with RGB Images" arXiv preprint arXiv:1911.07347 (2019).
- Siddhartha Banerjee *et al.* "Taking Recoveries to Task: Recovery-Driven Development for Recipe-based Robot Tasks" in *Proceedings of 2019 International Symposium of Robotics Research (ISRR)*
- Abhinav Jain. "Acceleration and Optimization of 3D Reconstruction Algorithms on GPUs", thesis advised by Dr. Carl Sable *The Cooper Union School of Engineering* May 2018

PATENTS

- "Audio-video synchronization for non-original audio tracks." U.S. Patent No. 11,610,610. 21 Mar. 2023.
- "Person replacement utilizing deferred neural rendering." U.S. Patent No. 11,582,519. 14 Feb. 2023.
- "Facial synchronization utilizing deferred neural rendering." U.S. Patent No. 11,581,020. 14 Feb. 2023.
- "Event-based Audio-Video Sync Detection" U.S. Patent Filed Mar 30, 2021
- "Automated generation and presentation of sign language avatars for video content" U.S. Patent Filed Dec 18, 2021
- "Video content interactions in augmented reality" U.S. Patent Filed Dec 12, 2022

TECHNICAL SKILLS

Comp. Languages	Java, Python, C++, SQL, R, JavaScript, C#, Bash, HTML, CSS, MySQL
Extension & APIs	WebGL, OpenCV, Nvidia CUDA, PyTorch, Tensorflow, Keras, ROS
Software & Tools	Linux, LaTeX, git, vim
Languages	English, Hindi
Personal Interests	Cycling, Electronics Repair, Classical Guitar, Reading

HONORS & AWARDS

Half-tuition Scholarship & Innovative Merit Scholarship **September 2014 – May 2018**
The Cooper Union *New York, NY*

- Awarded a half tuition scholarship and a merit scholarship from the Cooper Union

Harald Kiel Fund Award **May 2018**
The Cooper Union *New York, NY*

- Awarded the Harald Kiel Fund Award for contributions to the Cooper Union IT Department

First Place in FetchIt! The Mobile Manipulation Challenge **May 2019**
Fetch Robotics *Montréal, QC, Canada*

- Won first place in the FetchIt! Mobile Manipulation Challenge at ICRA 2019
- Created an algorithm for peg insertion using minimal force sensory information

REVIEWERSHIP

- Reviewer at 2019 IEEE/CVF International Conference on Computer Vision (ICCV 2019).
- Reviewer at 2019 IEEE International Conference on Robotics and Automation (ICRA 2019).
- Reviewer at 2020 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2020).
- Reviewer at The 2022 Conference on Empirical Methods in Natural Language Processing (EMNLP 2022).
- Reviewer at The 7th Workshop on Online Abuse and Harms (WOAH) at ACL 2023.