Shubham Agrawal

agshubh191@gmail.com | 213-446-5430 | Website: agshubh.com | New York City, NY

Education

Columbia University in the City of New York — New York, NY
Master of Science in Computer Science; Vision, Graphics, Interaction and Robotics track; CGPA: 3.8/4.0 — *Aug 2019 - May 2021*

Indian Institute of Technology Kanpur — Kanpur, India
Bachelor of Technology in Computer Science; CGPA: 8.7/10.0 — *Jul 2013 - Apr 2017*

Experience

Samsung Research America — New York, NY, USA
Senior Researcher, Machine Learning — *March 2023 - Present*
Engineer Machine Learning Research — *Jun 2021 - March 2023*

- **Led perception team for the inter-team table-clearing benchmark competition**. Key components: (a) In-house 6DoF Perception Data collection and labeling tool **Video** , (b) instance segmentation, (c) 6DoF pose estimation, (d) glass detection, (e) stereo depth prediction, and (f) fusion of single view predictions into a coherent world map
- Research on 3D scene understanding for robotics tasks. Relevant papers: Real-time simultaneous multi-object 3D Shape Reconstruction, 6DoF Pose Estimation, and Dense Grasp Prediction arXiv , Simultaneous object reconstruction and grasp prediction arXiv arXiv

Tesla Inc — Palo Alto, USA (remote)
Autopilot Intern (Non Disclosure Agreement) — *Jun 2020 - Aug 2020*

- Worked on identifying and associating the same objects visible in multiple cameras to create object tracks across time.

Adobe Inc — Noida, India
Member of Technical Staff (C++, JavaScript Software Developer) — *Jul 2017 - Jan 2019*

- Implemented CRUD operations for highlight/underline/sticky notes for next generation PDF webview using Javascript.

Research Intern (Machine Learning) — *May 2016 - Aug 2016 (voluntarily working till Jun 2017)*

- Created a novel end-to-end system for automated design of affinity (user's interest) based smart geo-fences for selective targeting. US Patent US20180232767A1 . ACM SIGSPATIAL'17 conference paper

Projects and Publications

- **[2023 IEEE IROS] Real-time simultaneous multi-object 3D Shape Reconstruction, 6DoF Pose Estimation and Dense Grasp Prediction**: **Shubham Agrawal**, Nikhil Chavan-Dafle, Isaac Kasahara, Selim Engin, Jinwook Huh, and Volkan Isler. **arXiv**
- **[2023 (under review)] RICo: Rotate-Inpaint-Complete for Generalizable Scene Reconstruciton**: Isaac Kasahara, **Shubham Agrawal**, Selim Engin, Nikhil Chavan-Dafle, Shuran Song, and Volkan Isler.
- **[2022 IEEE IROS] SEaT: Scene Editing as Teleoperation**: **Shubham Agrawal***, Yulong Li*, Jen-Shuo Liu, Steven K. Feiner, and Shuran Song. Scene Editing as Teleoperation: A Case Study in 6DoF Kit Assembly. (∗ = equal contributions). arXiv , **Website** .
- **[2021 PMLR CoRL] Fit2Form: 3D Generative Model for Robot Gripper Form Design**: **Shubham Agrawal***, Huy Ha*, and Shuran Song. PMLR CoRL , **Website** .
- **[2021 IEEE ICRA] AdaGrasp: Learning an Adaptive Gripper-Aware Grasping Policy**: Zhenjia Xu, Beichun Qi, Shubham Agrawal, Shuran Song. arXiv , Website .
- **[2022 IEEE IROS] Simultaneous object reconstruction and grasp prediction using camera-centric object shell representation**: Nikhil Chavan Dafle, Sergiy Popovich, Shubham Agrawal, Daniel Lee, Volkan Isler. IROS
- **[2021 US Patent] Smart geo-fencing using location sensitive product affinity**: Ankur Garg, Sweta Agrawal, Shubham Agrawal, Payal Bajaj, Abhishek Kedia. Google patents
- **[2021 arXiv] Automatic differentiation and continuous sensitivity analysis of rigid body dynamics**: David Millard, Eric Heiden, Shubham Agrawal, Gaurav S Sukhatme. arXiv

Skills

- **Languages | Libraries**: C++, Python, Pytorch, Ray, ROS, (Isaac Sim, Pybullet, Gazebo) simulators
- **Hardware Experience**: (UR5, Panda, Kinova, Ridgeback) Robots, (WSG50, RG2, BHand) Grippers, RGB-D Cameras, Raspberry Pi

Achievements & Extracirricular

- **Course Assistant Fellowship**, Columbia University: awarded for stellar academic performance and outstanding work as a TA
- Selected for **Advanced Master Research Specialization** at Columbia University offering one fully - funded semester of research
- **All India Rank 191**, IIT-JEE Advanced 2013 (among 150K candidates)
- Course assistantships: Computational Aspects of Robotics (**Head TA**) , Applied Machine Learning , Advanced Database Systems
- Research assistantships: Shuran Song Columbia University (Sept 2019 - present), Gaurav Sukhatame USC (May 2019 - Aug 2019)
- Received *Academic Excellence Award* for excellent academic performance during 2013-14 curriculum at IIT Kanpur
- Served as CS Department Senator at Viterbi Graduate Student Association, University of Southern California for spring semester, 2019
- Co-created TOEFL Infinite , an android application for TOEFL and GRE exam preparation with 150K downloads on Google Play