

# Shubham Agrawal

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## EDUCATION

### Columbia University in the City of New York

Master of Science in Computer Science; Vision, Graphics, Interaction and Robotics track; CGPA: 3.8/4.0

New York, NY  
Aug 2019 - May 2021

### Indian Institute of Technology Kanpur

Bachelor of Technology in Computer Science; CGPA: 8.7/10.0

Kanpur, India  
Jul 2013 - Apr 2017

## EXPERIENCE

### Samsung Research America

Senior Researcher, Machine Learning

Engineer Machine Learning Research

New York, NY, USA  
March 2023 - Present  
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](#) [✉](#)

### Tesla Inc

Autopilot Intern (Non Disclosure Agreement)

Palo Alto, USA (remote)  
Jun 2020 - Aug 2020

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

### Adobe Inc

Member of Technical Staff (C++, JavaScript Software Developer)

Noida, India  
Jul 2017 - Jan 2019

- Implemented CRUD operations for highlight/underline/sticky notes for next generation PDF webview using Javascript.
- 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 (under review)] 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 Reconstruction:** 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 & EXTRACURRICULAR

- **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