

# 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; GPA: 3.8/4.0

New York, NY  
Aug 2019 - May 2021

### Indian Institute of Technology Kanpur

Bachelor of Technology in Computer Science; GPA: 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

- 3D computer vision research: Simultaneous scene understanding and grasp estimation, leveraging foundational visual language models for generalizable scene reconstruction. The research led to multiple publications and patents ( SceneGrasp , RIC ).
- Lidar to floorplan: Generated a visually pleasing rectilinear floor plan from a noisy lidar-scan image. (video ). The research technology is now in the production phase for the Samsung Robot Vacuum Cleaner.
- Autonomous table clearing and dishwasher loading - Key components: (a) in-house 6DoF perception data labeling tool (video ), (b) instance segmentation, (c) 6DoF pose estimation, (d) glass detection, (e) stereo depth prediction, and (f) sensor fusion.

### Tesla Inc (Non Disclosure Agreement)

Autopilot Intern

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

- Identify and associate the same objects visible in multiple cameras to create object tracks across time.

### Adobe Inc

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

Research Intern (Machine Learning)

Noida, India  
Jul 2017 - Jan 2019  
May 2016 - Aug 2016

- Implemented CRUD operations for highlight/underline/sticky notes for Adobe PDF Liquid mode . Shipped fixes for multiple critical security vulnerabilities (null pointer dereferencing, buffer overflow, JavaScript parameter tampering).

## PROJECTS AND PUBLICATIONS

- Real-time Simultaneous Multi-object 3D Shape Reconstruction, 6DoF Pose, and Dense Grasp Prediction IROS 2023 | Patent pending | S. Agrawal, N. Dafle, I. Kasahara, S. Engin, J. Huh, V. Isler Project page , Video , Code
- RIC: Rotate-Inpaint-Complete for Generalizable Scene Reconstruction 2023 (in review) | Patent pending | I. Kasahara, S. Agrawal, S. Engin, N. Dafle, S. Song, V. Isler Project page , Video  
Recognized as a strategically important patent in the Generative AI domain by Samsung's IP team.
- SEaT: Scene Editing as Teleoperation IROS 2022 | S. Agrawal\*, Y. Li\*, J. Liu, S. Feiner, S. Song (\* equal contributions) Project page , Video , Code
- Camera-centric Object Shell Representation for Simultaneous Object Reconstruction and Grasp Prediction IROS 2022 | Patent pending | N. Dafle, S. Popovich, S. Agrawal, D. Lee, V. Isler ArXiv , Video
- Fit2Form - 3D Generative Model for Robot Gripper Form Design CoRL 2021 | S. Agrawal\*, H. Ha\*, S. Song Project page , Video , Code
- AdaGrasp: Learning an Adaptive Gripper-Aware Grasping Policy ICRA 2021 | Z. Xu, B. Qi, S. Agrawal, S. Song Project page , Video , Code
- Smart Geo-fencing with Location-Sensitive Product Affinity SIGSPATIAL 2017 | Patent | A. Garg, S. Choudhary, P. Bajaj, S. Agrawal, A. Kedia, S. Agrawal ArXiv

## SKILLS

- **Languages | Libraries**: C++, Python, PyTorch, XGBoost, scikit-learn, Ray, ROS, (Isaac Sim, Pybullet, Gazebo) simulators, Docker
- **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
- Co-founded TOEFL Infinite , an android application for TOEFL and GRE exam preparation with 150K downloads on Google Play
- Ranked 191 (99.8 percentile) among 150K candidates in IIT-JEE Advanced 2013 - entrance exam for premium engineering colleges in India
- Teaching: Computational Aspects of Robotics (Head TA) , Applied Machine Learning , Advanced Database Systems
- Research assistantships: Shuran Song Columbia University (Sept 2019 - Apr 2021), Gaurav Sukhatame USC (May 2019 - Aug 2019)
- CS Department Senator, University of Southern California
- Ran TCS New York City Marathon 2023. Love music and playing flute in my free time