

Shubham Agrawal

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EDUCATION

Columbia University in the City of New York

Master of Science in Computer Science; Advanced Masters Research Specialization in Vision and Robotics; 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

Autopilot Intern

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

- (Non Disclosure Agreement) 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
ICRA 2024 | Patent pending | I. Kasahara, [S. Agrawal](#), S. Engin, N. Dafle, S. Song, V. Isler
Recognized as a strategically important patent in the Generative AI domain by Samsung's IP team.
Project page [✉](#) , Video [✉](#)
- 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. Agrawal, [S. Agrawal](#), P. Bajaj, A. Kedia
Patent [✉](#) , ArXiv [✉](#)

SKILLS

- **Languages | Libraries:** C++, Python, Java, PyTorch, Spark, XGBoost, scikit-learn, ROS, Docker, SQL, GPU, Distributed Systems, GCP
- **Techniques:** Single/Multi-view geometry, Pose estimation, SLAM, Visual Inertial Odometry, Sensor Fusion, GAN/VAE/Diffusion models
- **Hardware Experience:** Robots (UR5, Panda, Kinova, Ridgeback), Grippers (WSG50, RG2, BHand), 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.