

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

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 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. 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
- 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