Rahul Sajnani

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Education

2022–present	**Ph.D. in Computer Science**, *Brown University*, USA, CGPA - 4.0 / 4.0
2017–2022	**Bachelor of Technology and Master of Science by Research in Electronics and Communication**, *International Institute of Information Technology*, Hyderabad, India, CGPA - 9.1/10, **(Gold Medal)**
2015–2017	**Senior Secondary School**, *Delhi Private School*, Sharjah, United Arab Emirates, Grade - 96/100

Research Experience

2023–2024 — Applied Scientist (Part-Time) Amazon Robotics, North Reading, Massachusetts, USA
Advisors: Jeroen Vanbaar , Kapil Katyal , Srinath Sridhar

- Baked 3D geometry in text-to-image diffusion models using GeoDiffuser for geometry editing without any fine-tuning. | PyTorch, PyTorch3D
- Improved item identification of occluded items by 4% for targeted robot picking using diffusion inpainting. Trained diffusion model to generate real-world tote images from layouts and text prompts.
- Experimented with abstract textual-inversion tokens for novel view synthesis and re-posing of objects.

2021–2022 — Research Intern (Remote) *Brown Visual Computing, Brown University*, USA
Advisor: Srinath Sridhar and Leonidas J. Guibas

- Worked on pose-equivariant architectures for unsupervised canonicalization of full and partial 3D point clouds. See ConDor! | PyTorch, Tensorflow

2019–2022 — Research Assistant, *Robotics Research Center (RRC), IIIT*, Hyderabad, India
Advisor: K. Madhava Krishna

- Designed, implemented, and brainstormed on weakly-supervised dense canonicalization technique DRACO to eradicate the need for ground-truth canonical maps to reduce the sim2real gap.| PyTorch, Open3D
- Proposed and implemented trajectory scaling method to scale the ego-trajectory to the absolute trajectory for monocular SLAM pipeline by leveraging features on the ground.| OpenCV
- Designing and building the perception for the Autonomous Driving Car.| Raspberry Pi, ROS

Publications

2024

[P.9] **Rahul Sajnani**, Jeroen Vanbaar, Jie Min, Kapil Katyal, Srinath Sridhar. *GeoDiffuser: Geometry-Based Image Editing with Diffusion Models*. IEEE Winter Conference on Applications of Computer Vision (**IEEE WACV** 2025). 📄

2023

[P.8] Rohith Agaram, Shaurya Dewan, **Rahul Sajnani**, Adrien Poulenard, Madhava Krishna, Srinath Sridhar. *Canonical Fields: Self-Supervised Learning of Pose-Canonicalized Neural Fields*. IEEE Conference on Computer Vision and Pattern Recognition (**IEEE CVPR** 2023 (Highlight)). 📄 🎧

[P.7] Qiuhong Anna Wei, Sijie Ding, Jeong Joon Park, **Rahul Sajnani**, Adrien Poulenard, Srinath Sridhar, Leonidas Guibas. IEEE Conference on Computer Vision and Pattern Recognition (**IEEE CVPR** 2023). 📄 🎧

2022

[P.6] **Rahul Sajnani**, Adrien Poulenard, Jivitesh Jain, Radhika Dua, Leonidas J. Guibas, Srinath Sridhar. IEEE Conference on Computer Vision and Pattern Recognition (**IEEE CVPR** 2022). 📄 🎧

[P.5] AadilMehdi J Sanchawala*, Adhithya Arun*, **Rahul Sajnani***, Rohan Chacko*, Kavita Vemuri. *Exploring Empathy and a Range of Emotions Towards Protest Photographs*. Proceedings of Cognitive Science Society 📄

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[1]Icons & underlined text are clickable links.

2021

[P.4] **Rahul Sajnani***, AadilMehdi Sanchawala*, Krishna Murthy Jatavallabhula, Srinath Sridhar, K. Madhava Krishna. *DRACO: Weakly Supervised Dense Reconstruction And Canonicalization of Objects.* IEEE International Conference on Robotics and Automation (**IEEE ICRA** 2021) 📄🄾

[P.3] Swapnil Daga, Gokul B. Nair, Anirudha Ramesh, **Rahul Sajnani**, Junaid Ahmed Ansari, K. Madhava Krishna. *BirdSLAM: Monocular Multibody SLAM in Bird's-Eye View.* International Conference on Computer Vision Theory and Applications (**VISAPP** 2021) 📄

2020

[P.2] AadilMehdi J Sanchawala*, Adhithya Arun*, **Rahul Sajnani***, Kavita Vemuri. *Unlocked: A Game On Human Trafficking.* IEEE Conference on Games (**IEEE CoG** 2020) [**nominated for best paper, featured in IIIT blog and Times of India**] ◆IEEE 🏛 TOI

[P.1] Gokul B. Nair, Swapnil Daga, **Rahul Sajnani**, Anirudha Ramesh, Junaid Ahmed Ansari, Krishna Murthy Jatavallabhula, K. Madhava Krishna. *Multi-object Monocular SLAM for Dynamic Environments.* IEEE Intelligent Vehicles Symposium (**IEEE IV** 2020) ◆IEEE📄

▬▬▬ Leadership

2021–2022 **Founder and Coordinator**, *The Skateboard Club, IIIT*, Hyderabad, India
  ○ Founded the skateboarding club and held skateboarding events catering to over 80-100 enthusiasts.
  ○ Obtained funds for the club and taught students how to skateboard.

2021–2022 **Head System Administrator**, *Robotics Research Center (RRC), IIIT*, Hyderabad, India
  ○ Implemented incremental cloud & local backup. | Rsnapshot, Restic
  ○ Server monitoring and management. | Grafana, Prometheus, Atop
  ○ Customized servers to achieve zero downtime.
  ○ Rapidly transferred users to different computing clusters after server fire without losing data.
  ○ Maintaining lab website. | Jekyll

2019–2021 **Advisor and Team Lead**, *The Dance Crew, IIIT*, Hyderabad, India 📧 f 📷 ▶
  ○ Expanded the crew from 5 coordinators to over 30 members and bifurcated them into multiple roles for better organization.
  ○ Planned and held workshops and events.
  ○ Interviewed new candidates to carry the crew's legacy forward and make them self-sufficient.

2019–2020 **House Captain**, *Aakash House, IIIT*, Hyderabad, India
  ○ Assisted students in house activities and led the band, dance, and skit practice sessions.

2016–2017 **Vice President Cultural (Arts)**, *DPS Sharjah*, UAE
  ○ Organized annual and quarterly cultural events that included art, dance, and music.

▬▬▬ Service

Reviewer CVPR, ICCV, ECCV, T-PAMI, ICLR, ACCV, TVCG.

▬▬▬ Awards

2022 Gold Medal (IIIT-H): Highest CGPA in ECD Stream.

2020–2021 Research Award (IIIT-H): Awarded to top 20 research students in the institute.

2019–2021 Dean's list and Merit list Award (IIIT-H): Awarded to top 5% of students in the institute with good academic standing.

2018 Selected for BountyCon organized by Facebook and Google held in Singapore. BountyCon is an invitation-only security conference wherein you hack Facebook and Google for bounty.

2017 Academic Trophy (DPS Sharjah): Awarded to top 15 students in the school.

▬▬▬ Teaching Experience

2019–2021	**Teaching Assistant**, *IIIT*, Hyderabad, India
	○ TA for Mobile Robotics, Digital Systems and Micro-controllers, and Electronics Workshop-2
	○ Conducted tutorial sessions, graded assignments, and exam papers.
Summer 2021	**Head Organizer of Robotics Summer School**, *Robotics Research Center (RRC), IIIT*, Hyderabad, India
	○ Planned and scheduled the Robotics Research Center Summer School for teaching lab entrants about Robotics and Computer Vision. N
	○ Taught concepts such as Multi-View Geometry, Transformations, Camera Modeling, Optimization, and Remote Server Usage basics. ⌂ ▶

▬▬▬ Selected Projects

August 2021	**Robotics Planning and Navigation** ⌂
	Implemented planning and navigation algorithms such as Rapidly Exploring Random Trees, dynamic collision avoidance using Collision Cones formulation, and Model Predictive Control.
April 2021	**Reinforcement Learning for Source Seeking** ⌂
	Implemented and simulated an autonomous drone in AirSim to find and reach the source of the heat signature. Implemented Q learning, DQN, and DDPG.⎸ AirSim, PyTorch-Lightning, and PyTorch
November 2020	**Cross-Lingual Reverse Dictionary Mapping** ⌂
	Implemented dictionary mapping by fine-tuning IndicBert to map phrases given in 6 native Indian languages to the closest word embedding in the target language.⎸ PyTorch-Lightning, PyTorch, and Faiss
September 2020	**Wikipedia Search Engine** ⌂
	Created a reverse index to search 45 GB of wiki data within a few seconds.
April 2020	**3D Reconstruction from Accidental Motion** ⌂
	Reconstructed the scene from accidental motion, which involves performing bundle adjustment followed by conditional random field optimization to obtain dense scene depth.⎸ OpenCV, Ceres Solver

▬▬▬ Skills

Languages	Python, MATLAB, C/C++, LaTeX
Libraries	PyTorch, Tensorflow, OpenCV, Ceres Solver, Open3D, PyTorch-Lightning, Hydra, Faiss, TorchText
Software	ROS, Git, Bash, Blender, Adobe Premiere Pro, Adobe illustrator, Audacity
Hobbies	Dancing, Playing Keyboard, Skateboarding *Rare:* Ethical Hacking