KAMAL GUPTA

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RESEARCH INTERESTS

My long-term goal is to build intelligent agents that can *see* (through vision, audio, and other senses), *interact* (navigate and act in an environment), and *reason* (plan long-term actions from sparse rewards).

EDUCATION

University of Maryland, College Park Aug. 2018 - May 2023
Ph.D. in Computer Science (4.0/4.0), Kulkarni fellow, Dean's fellow, Outstanding GRA Award
Advisors: Abhinav Shrivastava, Larry Davis
Thesis: Learning and Composing Primitives for the Visual World

Indian Institute of Technology Delhi Aug. 2007 - Dec. 2012
Bachelors + Masters in Electrical Engineering (8.6/10.0)
Advisor: Sanjiv Singh (Carnegie Mellon University)
Thesis: Pose Estimation for a Micro-Aerial Vehicle in GPS-denied environments

SELECTED PUBLICATIONS AND PATENTS

Visit Google Scholar tC3td8cAAAAJ for the complete list (* denotes equal contribution)

- SHACIRA: Scalable HAsh-grid Compression for Implicit Neural Representations *ICCV* 2023 [web, code]
  S. Girish, A. Shrivastava, **K. Gupta**
- Chop & Learn: Recognizing and Generating Object-State Compositions *ICCV* 2023 [web, code]
  N. Saini, H. Wang, A. Swaminathan, V. Jayasundara, B. He, **K. Gupta**, A. Shrivastava
- ASIC: Aligning Sparse in-the-wild Image Collections *ICCV* 2023 [web, code]
  K. Gupta, V. Jampani, C. Esteves, A. Shrivastava, A. Makadia, N. Snavely, A. Kar
- Teaching Matters: Investigating the Role of Supervision in Vision Transformers *CVPR* 2023 [web, code]
  M. Walmer*, S. Suri*, **K. Gupta**, A. Shrivastava
- LilNetX: Lightweight Networks with EXtreme Compression & Structured Sparsification *ICLR* 2023 [web, code]
  S. Girish, **K. Gupta**, S. Singh, A. Shrivastava
- Neural Space-Filling Curves *ECCV* 2022 [web, code]
  H. Wang, **K. Gupta**, L. Davis, A. Shrivastava
- PatchGame: Learning to Signal Mid-level Patches in Referential Games *NeurIPS* 2021 [web, code]
  K. Gupta, G. Somepalli, Anubhav, V. Jayasundara, M. Zwicker, A. Shrivastava
- LayoutTransformer: Layout Generation and Completion with Self-attention *ICCV* 2021 [web, code]
  K. Gupta, J. Lazarow, A. Achille, L. Davis, V. Mahadevan, A. Shrivastava
- The Lottery Ticket Hypothesis for Object Recognition *CVPR* 2021 [web, code]
  S. Girish*, S. Maiya*, **K. Gupta**, H. Chen, L. Davis, A. Shrivastava
- Improved Modeling of 3D Shapes with Multi-view Depth Maps *3DV* 2020 [web, code]
  K. Gupta*, S. Reddy*, K. Shah*, A. Shrivastava, M. Zwicker
- PatchVAE: Learning Local Latent Codes for Recognition *CVPR* 2020 [web, code]
  K. Gupta, S. Singh, A. Shrivastava
- Applying Multi-Dimensional Variables to Determine Fraud USPTO 16/426826, 2019
  K. Gupta, V. Jain
- Systems and methods for Updating Fraud Detection Variable USPTO 15/258880, 2018
  K. Gupta, V. Jain
- Systems and methods for customized real time data delivery USPTO 14/961614, 2015
  S. Sanyal, S. Purkayastha, T. Choudhuri, A. Choudhary, V. Grover, M. Naeem, P. Mehta, **K.Gupta**, A. Agarwal

WORK EXPERIENCE

Tesla Bot (Optimus) May 2023 –
Senior Machine Learning Scientist *Palo Alto, CA*
- Teaching humanoid robots to do anything

Google Research May 2022 – Aug. 2022
Research Intern (web) *Mountain View, CA (Remote)*
- 3D object reconstruction from in-the-wild Image Collections

NVIDIA AI May 2021 – Aug. 2021
Research Intern *Santa Clara, CA (Remote)*

- Generative modeling of textured meshes

Amazon AWS May 2019 – Aug. 2019
Research Intern (web) *Pasadena, CA*

- Generative modeling of layouts for diverse domains such as 3D objects, Wireframes, Documents, etc.

NetraDyne Mar. 2017 – Aug. 2018
Staff Research Engineer *Bengaluru, India*
Netradyne provides ADAS devices for commercial vehicles. Led a team of 4 to ship

- Distracted (texting, eating, drinking etc.) + drowsy driving detection pipeline for driver safety
- DriverI Fleet Safety and Coaching Platform to ingest and analyze millions of driving miles

Poolka Technologies Apr. 2016 – Feb. 2017
Cofounder, CTO *Bengaluru, India*

- Built Fairi, a fashion assistant chatbot that provides clothing recommendations based on social media trends and users' existing wardrobe. (Pose estimation, Clothing segmentation, Graph Convolutions, Language Models)
- Selected for **Microsoft Bizspark** and **IBM Global Enterpreneur** Program (>$20000 cloud credits per year)

Big Data Labs, American Express July 2013 – Mar. 2016
Research Engineer, Risk & Information Management *Bengaluru, India*

- Large scale recommendation systems, Geometric deep learning on financial data.
- **Platinum Genius Medal** - Systems and methods for customized real time data delivery Dec. 2015
- **Trainer of the Quarter** - Hadoop course for >200 AmEx employees in NYC, Gurgaon, Bangalore Dec. 2014
- IMS Hackathon (Winner 2015, Runner-up 2014), RIM InnoVision Challenge (Runner-up 2013) 2013-2015

Robotics Institute, Carnegie Mellon University June 2011 – June 2012
Research Intern *Pittsburgh, PA*

- Developed an approach to predict vineyard yields automatically and non-destructively with cameras (web)
- Estimated global pose of MAV using stereo visual odometry fused with infrequent GPS measurements (web)

Industrial Technology Research Institute (ITRI Taiwan) May 2010 – July 2010
Research Intern *Hsinchu, Taiwan*

- Designed an (SVM based) algorithm for detection of multiple vehicles in dim light for autonomous cars

VOLUNTEER/DEI INITIATIVES

- **Graduate Student Mentor**: CVPR Academy for first-time CVPR attendees 2022
- **Co-organizer:** SIGGRAPH RCDC mentorship program for Graphics graduate school applicants 2021
- **Instructor**: AI4ALL summer program for high school students 2020
- **Reviewer**: Computer Graphics - SIGGRAPH 2022, SIGGRAPH Asia 2023. Computer Vision - ECCV 2022. CVPR 2023, 2022*, 2021. ICCV 2021. Machine Learning - NeurIPS 2022, 2023. ICLR 2022. (* denotes Outstanding Reviewer Award)

MISCELLANEOUS

- Outstanding Research Assistant Award by the Graduate School, University of Maryland (web) 2022
- Outstanding Reviewer, CVPR (web) 2022
- Kulkarni Research Fellowship (web) 2020
- Dean's fellowship for outstanding academic achievement 2018-20
- **Talks**
  - Networks Research Group, NICTA: **Exploring location based social discovery networks** May 2013
  - Navigation Group, Robotics Institute, CMU: **Error Modeling in Visual Odometry** May 2012
- **Coordinator**: Robotics Club IIT Delhi 2008-10
- Master's Research Scholarship by Ministry of Human Resources and Development, Govt. of India May 2011
- CBSE Merit Scholarship for All India Rank 38 (600,000 appeared) in AIEEE, now called JEE-Main 2007
- National top 1% (40,000 appeared) in Physics Olympiad and Chemistry Olympiad 2006
- National Talent Search Exam Scholarship by Govt. of India 2005