Zaid Tasneem

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Education

2019–2024   **Ph.D.**, *Rice University*, Houston, TX,
Electrical and Computer Engineering
Thesis: Privacy-aware Computational Cameras and Frameworks
Advisor: Ashok Veeraraghavan

2016–2018   **M.S,**, *University of Florida*, Gainesville, FL,
Electrical and Computer Engineering
Thesis: Adaptive Depth Sensing
Advisor: Sanjeev Koppal

2012–2016   **B.Tech**, *Indian Institute of Technology Kanpur*, India
Mechanical Engineering

Research Positions

2023   **Visiting Researcher**, *MIT Media Lab*, Cambridge, MA
Faculty Host: Ramesh Raskar

2020–2021   **Research Intern**, *NEC Labs America*, San Jose, CA
Manager: Manmohan Chandraker

2019–2024   **Research Assistant**, *Rice University*, Houston, TX
Advisor: Ashok Veeraraghavan

2016–2019   **Research Assistant**, *University of Florida*, Gainesville, FL
Advisor: Sanjeev Koppal

2015   **Research Intern**, *University of Stuttgart*, Germany
Faculty Host: Achim Menges

Publications

2024   **DecentNeRFs: Decentralized Neural Radiance Fields**
Z. Tasneem, A. Dave, A. Singh, K. Tiwary, P. Vepakomma, A. Veeraraghavan, R. Raskar
European Conference on Computer Vision (ECCV), 2024

2024   **Privacy-aware Meta-Optics for Person Detection**
Z. Tasneem, J. Froch, Y. Zhao, A. Majumdar, A. Veeraraghavan
In submission

2022   **Learning Phase Mask for Privacy-Preserving Passive Depth Estimation**
Z. Tasneem, G. Milione, X. Yu, Y. Tsai, A. Veeraraghavan, M. Chandraker, F. Pittaluga
European Conference on Computer Vision (ECCV), 2022

2020   **Towards a Mems-based Adaptive Lidar**
Z. Tasneem[*], F. Pittaluga[*], J. Folden, B. Tilmon, A. Chakrabarti, S. Koppal
International Conference on 3D Vision (3DV), (* = Equal contribution)

2020	**Adaptive Fovea for Scanning Depth Sensors**
	Z. Tasneem, C. Adhivarahan, D. Wang, H. Xie, K. Dantu, S. Koppal
	International Journal of Robotics Research (IJRR), 2020
2018	**Directionally Controlled Time-of-Flight Ranging for Mobile Sensing Platforms**
	Z. Tasneem, D. Wang, H. Xie, S. Koppal
	Robotics: Science and Systems XIV, 2018
2018	**An Integrated Forward-View 2-Axis MEMS Scanner for Compact 3D LIDAR**
	D. Wang, S. Rojas, A. Shuping, Z. Tasneem, S. Koppal, H. Xie
	International Conference on Nano Engineered and Molecular Systems (IEEE NEMS), 2018

Patents

2024	**Private and Decentralized 3D from Crowd Sourced Image Data**
	Z. Tasneem, A. Dave, A. Singh, K. Tiwary, P. Vepakomma, A. Veeraraghavan, R. Raskar
	US Patent App. 63/640,404
2023	**Fast Foveation Camera and Controlling Algorithms**
	S. Koppal, Z. Tasneem, D. Wang, H. Xie, B. Tilmon
	US Patent 11,800,205
2022	**Learning Privacy-preserving Optics via Adversarial Training**
	F. Pittaluga, Z. Tasneem, G. Milione, X. Yu, M. Chandraker, Y. Tsai
	US Patent App. 17412704

Technical Projects

Low-level Vision ▪ Efficient ML ▪ Deep Optics ▪ Computational Imaging

Efficient ML	Real-time Deep Reconstructions from Lensless Measurements using Quantization
Analog NNs	Analog In-Pixel Neural Networks for Efficient and Private Imaging
Transformers	Privacy-Aware Meta Optics for Object Detection using Tranformers
DOEs	Privacy-aware Depth Prediction using Diffractive Optics

3D Reconstruction ▪ Machine Learning ▪ Privacy ▪ Federated Learning

3D GS	Privacy-Aware Federated Gaussian Splatting from Crowd-sourced Images
NeRFs	Privacy-aware Decentralized Neural Radiance Fields
RL	Evolutionary search for 3D visual intelligence using Reinforcement Learning

Robotics ▪ 3D Imaging ▪ Adaptive Sensing ▪ TOF ▪ LIDARs

RGB+LIDAR	Camera and MEMS modulated LIDAR for color-guided depth upsampling
LIDAR	Adaptive depth sensing algorithms for scanning LIDARs
Sensor Fusion	Visual Odometry for Indoor Localization of UAVs

Bio-Medical Imaging ▪ Lensless Imaging ▪ Physiological Measurement

FlatScope	Lensless Wearable Microscopes for Vasculature and Perfusion Imaging in Wounds
PulseOx	Measusing Blood Oxygenation using Reflective Pulse Oximeter

Technical Skills

ML/CV	Federated Learning, NeRF, 3D Reconstruction, Novel View Synthesis, Gaussian Splats, Tranformers, U-Net, CNNs, Differential Privacy, Object Detection

Programming	Python, C++, Pytorch, Linux, OpenCV, Hugging Face, MATLAB, ROS, Flower
Courses	Deep Learning, Efficient Computing , Computer Vision, Computational Imaging
Hardware	LIDAR, MEMS, DOEs, Meta Optics, SLMs, Lasers, Nanofabrication, 3D printing

Selected Honors

2018	**Best Student Paper Prize**, *2018 IEEE NEMS Conference*
2014	**Technical Externship Grant**, *Boeing*, Abhyast Phase - V
2014	**Best Mechanical Design Project Prize**, *Mechanical Engineering, IIT Kanpur*
2013	**Pitch your Product - Winner**, *Entrepreneurship-summit'13, IIT Kanpur*
2013	**Second-best Manufacturing Design Project**, *Material Science Dept., IIT Kanpur*

Teaching and Academic Service

Teaching Assistant	Computer Vision (2022,2023), Deep Learning (2019,2021), Computational Imaging (2022), 3D Vision (2020)
Research Mentor	*Graduates*: P. Singh (ongoing), K. Tiwary (ongoing), H. Guo (2022) *Undergraduates*: A. Sheikh (2023), J. Rodriguez (2021), M. Tang (2020)
Reviewer	*Journals*: IEEE TPAMI, Springer Nature Autonomous Robots. *Conferences*: ECCV 2020, CVPR 2022,2024

Invited Talks

Flower Labs	**Decentralized Neural Radiance Fields**, *Flower Monthly*, 2024 Host: Nic Lane
MIT	**Privacy-Preserving Computational Cameras**, *Camera Culture Group Talk*, 2022 Host: Ramesh Raskar
imec	**Adaptive Depth Sensing**, 2018 Host: Umar Piracha

Organization

2022-2023	**President**, *Graduate Student Association*, Electrical Engineering, Rice University
2021-2022	**Social Chair**, *Graduate Student Association*, Electrical Engineering, Rice University
2014	**Coordinator**, *Annual Cultural Festival*, IIT Kanpur
2012-2013	**Member**, *Robocon'13*, Robotics Team, IIT Kanpur