Tejas Gokhale

Contact

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Appointment

Assistant Professor
Department of Computer Science & Electrical Engineering
University of Maryland Baltimore County

Research area

Robust computing for perception, communication, learning, and reasoning.
Computer Vision, Machine Learning, Robustness & Reliability, Multimodal Learning

Education

Doctor of Philosophy, Arizona State University — 08/2018–05/2023
School of Computing and Augmented Intelligence
Advisors: Yezhou Yang, Chitta Baral
Thesis: Towards Reliable Semantic Vision

Master of Science, Carnegie Mellon University — 08/2016–12/2017
Department of Electrical and Computer Engineering
Mentor: Aswin Sankaranarayanan

Bachelor of Engineering (Honours), BITS Pilani — 08/2011–05/2015
Department of Electrical and Electronics Engineering

Employment history

Microsoft Research — Summer 2022
Research Intern, Adaptive Systems and Interaction Group
Mentors: Hamid Palangi, Besa Nushi, Vibhav Vineet, Eric Horvitz

Lawrence Livermore National Laboratory — Summer 2021, 2020
Research Scholar, Machine Intelligence Group
Mentors: Rushil Anirudh, Jay Thiagarajan, Bhavya Kailkhura

Arizona State University
Graduate Research Associate, School of Computing and AI — 2018–2023
Graduate Teaching Associate, School of Computing and AI — 2018–2020

Snap Research — Summer 2018
Research Intern, Computational Imaging Group
Mentors: Guru Krishnan, Shree Nayar

Carnegie Mellon University — 2017–2018
Graduate Student Researcher, Dept. of Electrical and Computer Engineering

ST Microelectronics — Fall 2014
Intern, High Speed Links Group

Steel Authority of India Limited — Summer 2013
Summer Intern, Bhilai Steel Plant

Teaching

Instructor, UMBC

CMSC 491/691 Computer Vision	Spring 2024
CMSC 491/691 Computer Vision	Fall 2023

Teaching Assistant, Arizona State University

CSE310: Data Structures & Algorithms	Spring 2020
CSE408: Multimedia Information Systems	Spring 2019
CSE110: Introduction to Programming,	Fall 2018

Guest Lecturer, Arizona State University

CSE598, Perception in Robotics	Spring 2022
CSE408, Multimedia Information Systems	Spring 2019

Student Instructor, BITS Pilani Goa Campus

CTE: Advanced Image Processing	Spring 2015

Publications

See my Google Scholar page for recent updates and citation information.
Ψ: student mentee at ASU; underlined: my graduate advisee; ∗: co-first author

Ph.D. Dissertation

[T1] **Tejas Gokhale**. 2023. "Towards Reliable Semantic Vision." Order No. 30426752, Arizona State University. https://www.proquest.com/docview/2813822780

Conference Proceedings

[C1] Sheng Cheng, **Tejas Gokhale**, Yezhou Yang. Adversarial Bayesian Augmentation for Single-Source Domain Generalization. In Proceedings of the IEEE/CVF International Conference on Computer Vision, 2023
https://arxiv.org/abs/2307.09520 ICCV 2023

[C2] Man Luo, Zhiyuan Fang, **Tejas Gokhale**, Yezhou Yang, Chitta Baral. End-to-end Knowledge Retrieval for Multi-modal Queries. In Proceedings of the 61st Annual Meeting of the Association for Computational Linguistics. Association for Computational Linguistics.
https://arxiv.org/abs/2306.00424 ACL 2023

[C3] **Tejas Gokhale**, Rushil Anirudh, Jayaraman J. Thiagarajan, Bhavya Kailkhura, Chitta Baral, and Yezhou Yang. Improving Diversity with Adversarially Learned Transformations for Domain Generalization. In Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision, pp. 434-443. 2023.
https://arxiv.org/abs/2206.07736 WACV 2023

[C4] Maitreya Patel$^{\Psi}$, **Tejas Gokhale**, Chitta Baral, and Yezhou Yang. 2022. CRIPP-VQA: Counterfactual Reasoning about Implicit Physical Properties via Video Question Answering. In Proceedings of the 2022 Conference on Empirical Methods in Natural Language Processing, pages 9856–9870, Abu Dhabi, United Arab Emirates. Association for Computational Linguistics.
https://arxiv.org/abs/2211.03779 EMNLP 2022

[C5] **Tejas Gokhale**, Abhishek Chaudhary[Ψ], Pratyay Banerjee, Chitta Baral, and Yezhou Yang. 2022. Semantically Distributed Robust Optimization for Vision-and-Language Inference. In Findings of the Association for Computational Linguistics: ACL 2022, pages 1493–1513, Dublin, Ireland. Association for Computational Linguistics.
https://arxiv.org/abs/2110.07165 ACL Findings 2022

[C6] **Tejas Gokhale**, Swaroop Mishra, Man Luo, Bhavdeep Sachdeva, and Chitta Baral. 2022. Generalized but not Robust? Comparing the Effects of Data Modification Methods on Out-of-Domain Generalization and Adversarial Robustness. In Findings of the Association for Computational Linguistics: ACL 2022, pages 2705–2718, Dublin, Ireland. Association for Computational Linguistics.
https://arxiv.org/abs/2203.07653 ACL Findings 2022

[C7] Neeraj Varshney, Pratyay Banerjee, **Tejas Gokhale**, and Chitta Baral. 2022. Unsupervised Natural Language Inference Using PHL Triplet Generation. In Findings of the Association for Computational Linguistics: ACL 2022, pages 2003–2016, Dublin, Ireland. Association for Computational Linguistics.
https://arxiv.org/abs/2110.08438 ACL Findings 2022

[C8] Yiran Luo, Pratyay Banerjee, **Tejas Gokhale**, Yezhou Yang, and Chitta Baral. 2022. To Find Waldo You Need Contextual Cues: Debiasing Who's Waldo. In Proceedings of the 60th Annual Meeting of the Association for Computational Linguistics (Volume 2: Short Papers), pages 355–361, Dublin, Ireland. Association for Computational Linguistics.
https://arxiv.org/abs/2203.16682 ACL 2022

[C9] Man Luo, Arindam Mitra, **Tejas Gokhale**, and Chitta Baral. Improving biomedical information retrieval with neural retrievers. In Proceedings of the AAAI Conference on Artificial Intelligence, vol. 36, no. 10, pp. 11038-11046. 2022.
https://arxiv.org/abs/2201.07745 AAAI 2022

[C10] Pratyay Banerjee, **Tejas Gokhale**, Yezhou Yang, and Chitta Baral. "Weakly supervised relative spatial reasoning for visual question answering." In Proceedings of the IEEE/CVF International Conference on Computer Vision, pp. 1908-1918. 2021.
https://arxiv.org/abs/2109.01934 ICCV 2021

[C11] Pratyay Banerjee, **Tejas Gokhale**, Yezhou Yang, and Chitta Baral. 2021. WeaQA: Weak Supervision via Captions for Visual Question Answering. In Findings of the Association for Computational Linguistics: ACL-IJCNLP 2021, pages 3420–3435, Online. Association for Computational Linguistics.
https://arxiv.org/abs/2012.02356 ACL Findings 2021

[C12] Pratyay Banerjee, **Tejas Gokhale**, and Chitta Baral. 2021. Self-Supervised Test-Time Learning for Reading Comprehension. In Proceedings of the 2021 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies, pages 1200–1211, Online. Association for Computational Linguistics.
https://arxiv.org/abs/2103.11263 NAACL 2021

[C13] **Tejas Gokhale**, Rushil Anirudh, Bhavya Kailkhura, Jayaraman J. Thiagarajan, Chitta Baral, and Yezhou Yang. Attribute-guided adversarial training for robustness to natural perturbations. In Proceedings of the AAAI Conference on Artificial Intelligence, vol. 35, no. 9, pp. 7574-7582. 2021.
https://arxiv.org/abs/2012.01806 AAAI 2021

[C14] **Tejas Gokhale***, Pratyay Banerjee*, Chitta Baral, and Yezhou Yang. 2020. MUTANT: A Training Paradigm for Out-of-Distribution Generalization in Visual Question Answering. In Proceedings of the 2020 Conference on Empirical Methods in Natural Language Processing (EMNLP), pages 878–892, Online. Association for Computational Linguistics.
https://arxiv.org/abs/2009.08566 EMNLP 2020

[C15] Zhiyuan Fang*, **Tejas Gokhale***, Pratyay Banerjee, Chitta Baral, and Yezhou Yang. 2020. Video2Commonsense: Generating Commonsense Descriptions to Enrich Video Captioning. In Proceedings of the 2020 Conference on Empirical Methods in Natural Language Processing (EMNLP), pages 840–860, Online. Association for Computational Linguistics.
https://arxiv.org/abs/2003.05162 EMNLP 2020

[C16] **Tejas Gokhale***, Pratyay Banerjee*, Chitta Baral, and Yezhou Yang. Vqa-lol: Visual question answering under the lens of logic. In Computer Vision–ECCV 2020: 16th European Conference, Glasgow, UK, August 23–28, 2020, Proceedings, Part XXI 16, pp. 379-396. Springer International Publishing, 2020
https://arxiv.org/abs/2002.08325 ECCV 2020

Workshop Papers / Extended Abstracts

[W1] Maitreya Patel$^{\Psi}$, **Tejas Gokhale**, Chitta Baral, Yezhou Yang. ConceptBed: Evaluating Concept Learning Abilities of Text-to-Image Diffusion Models.
https://arxiv.org/abs/2306.04695 NeurIPS 2023 Workshop on Diffusion Models

[W2] Sourajit Saha and **Tejas Gokhale**. Improving Shift Invariance in Convolutional Neural Networks with Translation Invariant Polyphase Sampling. (to appear) In Workshop on Out of Distribution Generalization in Computer Vision at ICCV 2023.
OOD-CV @ ICCV 2023

[W3] **Tejas Gokhale***, Joshua Feinglass*, and Yezhou Yang. Covariate Shift Detection via Domain Interpolation Sensitivity. In First Workshop on Interpolation Regularizers and Beyond at NeurIPS 2022. https://openreview.net/pdf?id=YkPjTHZDdm
[SPOTLIGHT] NeurIPS 2022 Interpolation Workshop

[W4] Kuldeep Kulkarni, **Tejas Gokhale**, Rajhans Singh, Pavan Turaga, Aswin C. Sankaranarayanan. Halluci-Net: Scene Completion by Exploiting Object Co-occurrence Relationships. In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops. 2021.
https://arxiv.org/abs/2004.08614 AI for Content Creation @ CVPR 2021

[W5] **Tejas Gokhale**, Shailaja Sampat, Zhiyuan Fang, Yezhou Yang, and Chitta Baral. Cooking with blocks: A recipe for visual reasoning on image-pairs. In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops, pp. 5-8. 2019.
Long version: https://arxiv.org/abs/1905.12042 Vision Meets Cognition @ CVPR'19

[W6] **Tejas Gokhale**. Vision beyond Pixels: Visual Reasoning via Blocksworld Abstractions. In IJCAI, pp. 6436-6437. 2019.
https://www.ijcai.org/Proceedings/2019/0907.pdf IJCAI Doctoral Consortium

Preprints

[P1] Agneet Chatterjee[Ψ], Yiran Luo, **Tejas Gokhale**, Chitta Baral, Yezhou Yang. Spade: Training-Free Improvement of Spatial Fidelity in Text-to-Image Generation — in review

[P2] Agneet Chatterjee[Ψ], **Tejas Gokhale**, Chitta Baral, Yezhou Yang. On the Robustness of Language Guidance for Low-Level Vision Tasks: Findings from Depth Estimation — in review

[P3] Maitreya Patel[Ψ], Neeraj Varshney, Agneet Chatterjee[Ψ], **Tejas Gokhale**, Yezhou Yang, Chitta Baral. Reliability-Checklist: A Framework for Comprehensively Evaluating the Reliability of NLP Systems
https://github.com/Maitreyapatel/reliability-checklist — in review

[P4] **Tejas Gokhale**, Hamid Palangi, Besmira Nushi, Vibhav Vineet, Eric Horvitz, Ece Kamar, Chitta Baral, and Yezhou Yang. Benchmarking Spatial Relationships in Text-to-Image Generation. arXiv preprint arXiv:2212.10015 (2022).
https://arxiv.org/abs/2212.10015 — in review

[P5] Ethan Wisdom[Ψ], **Tejas Gokhale**, Chaowei Xiao, and Yezhou Yang. Mole Recruitment: Poisoning of Image Classifiers via Selective Batch Sampling. arXiv preprint arXiv:2303.17080 (2023). https://arxiv.org/abs/2303.17080 — in review

[P6] Yiran Luo, Joshua Feinglass, **Tejas Gokhale**, Chitta Baral, Yezhou Yang. Grounding Stylistic Domain Generalization with Quantitative Domain Shift Measures and Synthetic Scenes — in review

Book Manuscript

[B1] *Advances in Multi-Modal Information Retrieval*
(In Preparation) — Springer

[B2] *Advances in Robust Computer Vision*
(In Preparation) — Springer

Intellectual Property

[IP1] *Automated Evaluation of Spatial Relationships in Images*
(US Patent App. 18/198,593)

[IP2] *Systems, Methods, and Apparatuses for Implementing Improved Diversity using Adversarially Learned Transformations for Domain Generalization*
(Provisional Patent)

Grants — Google Cloud Education Credits, $2350 — 09/2023 – 09/2024

Student Mentoring

PhD Students

- Sourajit Saha — Ph.D. CS [current], UMBC
- Ethan Wisdom (see publication [P5]) — Ph.D. CS [current], ASU
- Maitreya Patel (see publication [C4]) — Ph.D. CS [current], ASU
- Agneet Chatterjee — Ph.D. CS [current], ASU

MS (Thesis) Students

- Maitreya Patel (see publication [C4]) M.S. CS 2022 [thesis]
- Abhishek Chaudhary (see publication [C5]) M.S. CS 2021 [thesis]

Undegraduate Students

- UMBC CWIT Scholar: Danielle Burton 2023-24
- ASU FURI Program: Mertay Dayanc BS CS, 2020
- ASU Capstone: Paul Butler, Jace Lord, Aashwin Ranjan, Sagarika Pannase, William Tith Fall 2019, Spring 2020

PRESENTATIONS

(Invited Talk), PRG Seminar, UMIACS (University of Maryland) 11/2023
"Robust Visual Understanding in the Multimodal Era"

(Invited Talk) *"Towards Reliable Semantic Vision"* Spring 2023

- Temple University, 04/2023
- Colorado School of Mines, 03/2023
- Case Western Reserve Univesity, 03/2023
- Indiana University, 03/2023
- University of Maryland Baltimore County, 03/2023
- Binghamton University, 03/2023
- Rochester Institute of Technology, 02/2023

(Tutorial), Winter Conference on Applications of Computer Vision 01/2023
"Semantic Data Engineering for Robustness Under Multimodal Settings"

(Invited Talk) University of Illinois at Chicago 10/2022
"Robust Semantic Vision"

(Invited Talk) Microsoft Research 10/2022
"Benchmarking Spatial Relationships in Text-to-Image Generation"

(Guest Lecture) Arizona State University CSE 598 03/2022
"Introduction to Generalization in Semantic Vision"

(Invited Talk) Arizona State University ML Club 09/2021
"Robust Visual Understanding"

(Doctoral Consortium), International Joint Conference on AI, Macao 08/2019
"Vision Beyond Pixels"

(Tutorial) Telluride Neuromorphic Cognition Engineering Workshop, 07/2019
"Reasoning about Objects and Actions via Block-Play"

(Invited) Birla Institute of Technology and Science (BITS Pilani) 04/2018
"Deep Learning Methods in Imaging and Computer Vision"

Academic Service

Reviewing:

- Conference on Computer Vision and Pattern Recognition (CVPR) 2023
- International Conference on Computer Vision (ICCV) 2023
- International Conference on Machine Learning (ICML) 2023
- Advances in Neural Information Processing Systems (NeurIPS) 2022–23
- International Conference on Learning Representations (ICLR) 2022–24
- AAAI Conference on Artificial Intelligence (AAAI) 2021–24
- European Conference on Computer Vision (ECCV) 2022
- Association for Computational Linguistics (ACL) 2021–23
- Empirical Methods in Natural Language Processing (EMNLP) 2021–23
- North American Chapter of the Association for Computational Linguistics (NAACL) 2021–22
- Winter Conference on Applications of Computer Vision (WACV) 2021–24
- International Conference on Robotics and Automation (ICRA) 2019–2023
- International Conference on Intelligent Robots and Systems (IROS) 2022
- IEEE Robotics and Automation Letter (RA-L) 2020
- Springer Machine Vision and Applications (MVAP) 2020

University Service (at UMBC):

- PPR Seminar: Advances in Perception, Prediction, and Reasoning 2023-
- CSEE Lightning Talks and Open House Fall 2023
- Graduate Admissions Committee AY 2023-24
- Department Publicity Committee AY 2023-24
- Faculty Mentor, Center for Women in Technology AY 2023-24

University Service (at ASU):

- Founder, Summer Vision Reading Group, [Website]
- Course Development, CSE591: Frontier Topics in Vision & Language [YouTube] [website] Spring 2021, ASU
- Volunteer, 2019 Southwest Robotics Symposium, Tempe AZ
- Volunteer, International Conference on Machine Learning 2020, Virtual
- Advisor, ASU Machine Learning Club, ASU
- Award Reviewer, GPSA Teaching Award Reviewer ASU
- Mentor, Graduate Student Mentorship Program, ASU
- Project Mentor, CSE598 - Perception in Robotics, ASU Spring 2022
- Project Mentor, CSE576 - Natural Language Processing, ASU Fall 2018

Professional Service:

- Organizer, Workshop on Open-Domain Reasoning under Multi-Modal Settings (ODRUM), [Website] CVPR'23
- Organizer, Workshop on Open-Domain Retrieval under Multi-Modal Settings (ODRUM), [Website] [YouTube] CVPR'22
- Organizer, Tutorial on Semantic Data Engineering under Multimodal Settings (SERUM) [Website] WACV'23
- Organizer, 2021 Frontiers of V&L Seminar Series, [Website], [YouTube] ASU

Awards

Research Excellence Award, ASU GPSA 2022
Outstanding Mentor Award, ASU GPSA 2022

NeurIPS Top Reviewer	NeurIPS 2022
CVPR 2022 Doctoral Consortium	CVPR 2022
ICLR Best Reviewer	ICLR 2022
SCAI Doctoral Fellowship (ASU),	2022, 2021, 2020
Engineering Graduate Fellowship, (ASU Engineering)	2023, 2020
ASU GPSA Travel Award	for WACV 2023
Graduate College Travel Award (declined)	WACV'23, CVPR'22
Graduate College Travel Award (accepted)	ICCV'21, EMNLP'20, ECCV'20
IJCAI 2019 Doctoral Consortium	IJCAI 2019
Inducted, IEEE Eta Kappa Nu, Sigma Chapter	CMU, 2017
National Talent Scholarship, National Council of Educational Research and Training (Govt. of India)	2007–2015

References

Available upon request