

Tejas Gokhale

CONTACT	Email: gokhale@umbc.edu Website: https://www.tejasgokhale.com Mail: 1000 Hilltop Circle, ITE 214, Baltimore MD 21250
APPOINTMENT	Assistant Professor Department of Computer Science & Electrical Engineering University of Maryland, Baltimore County Affiliated Faculty, UMBC AI Center
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 <i>Advisors:</i> Yezhou Yang , Chitta Baral <i>Thesis:</i> Towards Reliable Semantic Vision Master of Science , Carnegie Mellon University 08/2016–12/2017 Department of Electrical and Computer Engineering <i>Mentor:</i> 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 <i>Mentors:</i> Hamid Palangi , Besa Nushi , Vibhav Vineet , Eric Horvitz Lawrence Livermore National Laboratory Summer 2021, 2020 Research Scholar, Machine Intelligence Group <i>Mentors:</i> 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 <i>Mentors:</i> 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 Robust Machine Learning	Fall 2024
	CMSC 491/691 Computer Vision	Spring 2024
	CMSC 491/691 Computer Vision	Fall 2023
	CMSC 898 Pre-Doctoral Candidacy Research	Spring 2024
	CMSC 699 Independent Study	Spring 2024
	CMSC 699 Independent Study	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.	
	♣: student mentee at ASU; <u>underlined</u> : my graduate advisee; *: co-first author	

Conference Proceedings

- [C1] Agneet Chatterjee[♣], **Tejas Gokhale**, Chitta Baral, Yezhou Yang. On the Robustness of Language Guidance for Low-Level Vision Tasks: Findings from Depth Estimation
(to appear in) CVPR 2024
- [C2] Maitreya Patel[♣], **Tejas Gokhale**, Chitta Baral, Yezhou Yang. ConceptBed: Evaluating Concept Learning Abilities of Text-to-Image Diffusion Models. In Proceedings of the AAAI Conference on Artificial Intelligence, vol. 38, no. 13, pp. 14554-14562. 2024.
<https://arxiv.org/abs/2306.04695> AAAI 2024
- [C3] 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, pp. 11400-11410. 2023.
<https://arxiv.org/abs/2307.09520> ICCV 2023
- [C4] 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 (Volume 1: Long Papers), pp. 8573-8589. 2023.
<https://arxiv.org/abs/2306.00424> ACL 2023
- [C5] **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

- [C6] Maitreya Patel[‡], **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, pp. 9856-9870. 2022. <https://arxiv.org/abs/2211.03779> EMNLP 2022
- [C7] **Tejas Gokhale**, Abhishek Chaudhary[‡], 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, pp. 1493-1513. 2022. <https://arxiv.org/abs/2110.07165> ACL Findings 2022
- [C8] **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, pp. 2705-2718. 2022. <https://arxiv.org/abs/2203.07653> ACL Findings 2022
- [C9] 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, pp. 2003-2016. 2022. <https://arxiv.org/abs/2110.08438> ACL Findings 2022
- [C10] Yiran Luo, Pratyay Banerjee, **Tejas Gokhale**, Yezhou Yang, and Chitta Baral. 2022. To Find Waldo You Need Contextual Cues: Debiasing Who’s Waldo. In 60th Annual Meeting of the Association for Computational Linguistics, ACL 2022, pp. 355-361. Association for Computational Linguistics (ACL), 2022. <https://arxiv.org/abs/2203.16682> ACL 2022
- [C11] 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
- [C12] 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
- [C13] 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, pp. 3420-3435. 2021. <https://arxiv.org/abs/2012.02356> ACL Findings 2021
- [C14] 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, pp. 1200-1211. 2021. <https://arxiv.org/abs/2103.11263> NAACL 2021
- [C15] **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

- [C16] **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), pp. 878-892. 2020.
<https://arxiv.org/abs/2009.08566> EMNLP 2020
- [C17] 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), pp. 840-860. 2020.
<https://arxiv.org/abs/2003.05162> EMNLP 2020
- [C18] **Tejas Gokhale***, Pratyay Banerjee*, Chitta Baral, and Yezhou Yang. Vqa-lol: Visual question answering under the lens of logic. In European conference on computer vision, pp. 379-396. Cham: Springer International Publishing, 2020.
<https://arxiv.org/abs/2002.08325> ECCV 2020

Peer Reviewed Workshop Papers and Extended Abstracts

- [W1] Yiran Luo, Joshua Feinglass, **Tejas Gokhale**, Chitta Baral, Yezhou Yang. Grounding Stylistic Domain Generalization with Quantitative Domain Shift Measures and Synthetic Scene Images. In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops. 2024.
 CVPR 2024 Vision Datasets Understanding Workshop
- [W2] **Tejas Gokhale**. Towards Robust Visual Understanding: from Recognition to Reasoning. (to appear) In Proceedings of the AAAI Conference on Artificial Intelligence, vol. 38, no. 20, pp. 22665-22665. 2024.
<https://ojs.aaai.org/index.php/AAAI/article/view/30281> AAAI New Faculty Highlights
- [W3] Sourajit Saha and **Tejas Gokhale**. Improving Shift Invariance in Convolutional Neural Networks with Translation Invariant Polyphase Sampling. In Workshop on Out of Distribution Generalization in Computer Vision at ICCV 2023.
 ICCV 2023 OOD-CV Workshop
- [W4] **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> NeurIPS 2022 Interpolation Workshop
- [W5] 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> CVPR 2021 AI for Content Creation Workshop
- [W6] **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.
<https://arxiv.org/abs/1905.12042> CVPR 2019 Vision Meets Cognition Workshop
- [W7] **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 2019 Doctoral Consortium

Preprints

- [P1] Sourajit Saha, Tejas Gokhale. Improving Shift Invariance in Convolutional Neural Networks with Translation Invariant Polyphase Sampling
<https://arxiv.org/abs/2404.07410> in review
- [P2] Agneet Chatterjee[‡], Gabriela Ben Melech Stan, Estelle Guez Aflalo, Sayak Paul, Dhruva Ghosh, **Tejas Gokhale**, Ludwig Schmidt, Hannaneh Hajishirzi, Vasudev Lal, Chitta Baral, Yezhou Yang. Getting it Right: Improving Spatial Consistency in Text-to-Image Models
<https://arxiv.org/abs/2404.01197> in review
- [P3] Agneet Chatterjee[‡], Yiran Luo, **Tejas Gokhale**, Chitta Baral, Yezhou Yang. Rendering Tools Enable Spatial Fidelity in Vision-Language Models in review
- [P4] Maitreya Patel[‡], Neeraj Varshney, Agneet Chatterjee[‡], **Tejas Gokhale**, Yezhou Yang, Chitta Baral. Reliability-Checklist: A Framework for Comprehensively Evaluating the Reliability of NLP Systems <https://github.com/Maitreyapatel/reliability-checklist> Tech Report
- [P5] **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> Tech Report
- [P6] Ethan Wisdom[‡], **Tejas Gokhale**, Chaowei Xiao, and Yezhou Yang. Mole Recruitment: Poisoning of Image Classifiers via Selective Batch Sampling.
<https://arxiv.org/abs/2303.17080> in review

Books and Monographs

- [B1] *Advances in Multimodal Information Retrieval and Generation* Springer
Synthesis Lectures on Computer Vision, ISBN: 978-3-031-57815-1
Man Luo, **Tejas Gokhale**, Neeraj Varshney, Yezhou Yang, Chitta Baral. [\[website\]](#)
- [B2] *Advances in Robust Learning for Computer Vision*
(In Preparation) Springer
Tejas Gokhale

Ph.D. Dissertation

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

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* (US Patent App. 63/468,653)

FUNDING UMBC Summer Research Faculty Fellowship (SURFF) \$8,000; 2024
“Improving Continual Learning of Visual Recognition Systems via Targeted Unlearning”

Microsoft Research, [Accelerate Foundation Models Academic Research](#) \$20,000; 2024
 “A Framework for Quantifying Typicality of AI-Generated Images”

Google Cloud Education Credits \$2350; AY 2023-24

STUDENTS

PhD

- Sourajit Saha Ph.D. CS [current], UMBC
- Ethan Wisdom Ph.D. CS [current], ASU
- Maitreya Patel Ph.D. CS [current], ASU
- Agneet Chatterjee Ph.D. CS [current], ASU

MS Thesis

- Neel Patel M.S. CS [current] UMBC

MS Thesis (as Committee Member)

- Naoma Angela Tack (advisor: Don Engel) M.S. CS [current] UMBC

Undergraduate

- UMBC CWIT Scholar: Danielle Burton 2023-24

MS (Thesis) Mentees (before UMBC)

- Maitreya Patel (see publication [\[C6\]](#)) M.S. CS 2022 ASU [\[thesis\]](#)
- Abhishek Chaudhary (see publication [\[C7\]](#)) M.S. CS 2021 [\[thesis\]](#)

Undergraduate Mentees (before UMBC)

- ASU FURI Program: Mertay Dayanc BS CS, 2020
- ASU Capstone Project: Paul Butler, Jace Lord, Aashwin Ranjan, Sagarika Pannase, William Tith AY 2019-20

PRESENTATIONS

(Invited Talk), AAAI New Faculty Highlights 02/2024
“Towards Robust Visual Understanding: from Recognition to Reasoning” [\[website\]](#)

(Lightning Talk), IARPA Video-LINCS Proposers Day 02/2024
“Robust Visual Understanding: Knowledge-Guided and Multimodal Reasoning”

(Tutorial), Winter Conference on Applications of Computer Vision 01/2024
“Challenges with Evaluation of Text-to-Image Models” [\[website\]](#)

(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 University, 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” [\[website\]](#)

	(Invited Talk) University of Illinois at Chicago <i>“Robust Semantic Vision”</i>	10/2022
	(Invited Talk) Microsoft Research <i>“Benchmarking Spatial Relationships in Text-to-Image Generation”</i>	10/2022
	(Doctoral Consortium) CVPR, New Orleans <i>“Discovering Transformations for Generalization in Semantic Vision”</i>	06/2022
	(Guest Lecture) Arizona State University CSE 598 <i>“Introduction to Generalization in Semantic Vision”</i>	03/2022
	(Invited Talk) Arizona State University ML Club <i>“Robust Visual Understanding”</i>	09/2021
	(Doctoral Consortium), IJCAI, Macao <i>“Vision Beyond Pixels”</i>	08/2019
	(Tutorial) Telluride Neuromorphic Cognition Engineering Workshop, <i>“Reasoning about Objects and Actions via Block-Play”</i>	07/2019
	(Invited) Birla Institute of Technology and Science (BITS Pilani) <i>“Deep Learning Methods in Imaging and Computer Vision”</i>	04/2018
MEDIA	Frontiers of multimodal learning: A responsible AI approach Microsoft Research Blog	2023
ACADEMIC SERVICE	Area Chair: <ul style="list-style-type: none"> Advances in Neural Information Processing Systems (NeurIPS) Association for Computational Linguistics (ACL) Rolling Review North American Chapter of the ACL (NAACL) 	2024 2024 2024
	Reviewer / Program Committee: <ul style="list-style-type: none"> Conference on Language Models (COLM) Conference on Computer Vision and Pattern Recognition (CVPR) International Conference on Computer Vision (ICCV) International Conference on Machine Learning (ICML) Advances in Neural Information Processing Systems (NeurIPS) International Conference on Learning Representations (ICLR) AAAI Conference on Artificial Intelligence (AAAI) European Conference on Computer Vision (ECCV) Association for Computational Linguistics (ACL) Empirical Methods in Natural Language Processing (EMNLP) North American Chapter of the ACL (NAACL) Winter Conference on Applications of Computer Vision (WACV) International Conference on Robotics and Automation (ICRA) International Conference on Intelligent Robots and Systems (IROS) IEEE Robotics and Automation Letter (RA-L) IEEE Transactions of Pattern Analysis and Machine Intelligence (T-PAMI) Springer Machine Vision and Applications (MVAP) 	2024 2023-24 2023 2023-24 2022-23 2022-24 2021-24 2022-24 2021-24 2021-23 2021-23 2021-24 2019-2023 2022 2020-24 2024 2020
	Award Committee: <ul style="list-style-type: none"> Best Student Abstract Award Committee, AAAI 	2024

Leadership:

- Organizer, Tutorial on Responsibly Building Generative Models ECCV 2024
- Mentor, Undergraduate Student Consortium (AAAI-UC) AAAI 2024
- Organizer, Tutorial on Reliability of Generative Models in Vision [\[Website\]](#) WACV'24
- Organizer, Workshop on Open-Domain Reasoning under Multi-Modal Settings (ODRUM), [\[Website\]](#) [\[YouTube\]](#) 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

**UNIVERSITY
SERVICE****University Service (at UMBC):**

- Course Development, CMSC 491/691: Robust Machine Learning [\[Website\]](#)
- Course Development, CMSC 491/691: Computer Vision [\[Website\]](#)
- PPR Seminar: Advances in Perception, Prediction, and Reasoning [\[Website\]](#)
- 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
- Undergraduate Student Advisor 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

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