

Tejas Gokhale

CONTACT	Email: gokhale@umbc.edu Website: https://www.tejasgokhale.com	
APPOINTMENT	Assistant Professor Department of Computer Science & Electrical Engineering University of Maryland Baltimore County Affiliated Faculty UMBC AI Group	
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 School of Computing and Augmented Intelligence <i>Advisors:</i> Yezhou Yang , Chitta Baral <i>Thesis:</i> Towards Reliable Semantic Vision	08/2018–05/2023
	Master of Science , Carnegie Mellon University Department of Electrical and Computer Engineering <i>Mentor:</i> Aswin Sankaranarayanan	08/2016–12/2017
	Bachelor of Engineering (Honours) , BITS Pilani Department of Electrical and Electronics Engineering	08/2011–05/2015
EMPLOYMENT HISTORY	Microsoft Research Research Intern, Adaptive Systems and Interaction Group <i>Mentors:</i> Hamid Palangi , Besa Nushi , Vibhav Vineet , Eric Horvitz	Summer 2022
	Lawrence Livermore National Laboratory Research Scholar, Machine Intelligence Group <i>Mentors:</i> Rushil Anirudh , Jay Thiagarajan , Bhavya Kailkhura	Summer 2021, 2020
	Arizona State University Graduate Research Associate, School of Computing and AI Graduate Teaching Associate, School of Computing and AI	2018–2023 2018–2020
	Snap Research Research Intern, Computational Imaging Group <i>Mentors:</i> Guru Krishnan , Shree Nayar	Summer 2018
	Carnegie Mellon University Graduate Student Researcher, Dept. of Electrical and Computer Engineering	2017–2018
	ST Microelectronics Intern, High Speed Links Group	Fall 2014

Steel Authority of India Limited
Summer Intern, [Bhilai Steel Plant](#)

Summer 2013

TEACHING

Instructor, UMBC

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; 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] 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, 2024.
<https://arxiv.org/abs/2306.04695> AAAI 2024
- [C2] 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
- [C3] 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
- [C4] **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

- [C5] 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, pages 9856–9870, Abu Dhabi, United Arab Emirates. Association for Computational Linguistics.
<https://arxiv.org/abs/2211.03779> EMNLP 2022
- [C6] **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, pages 1493–1513, Dublin, Ireland. Association for Computational Linguistics.
<https://arxiv.org/abs/2110.07165> ACL Findings 2022
- [C7] **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
- [C8] 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
- [C9] 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
- [C10] 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
- [C11] 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
- [C12] 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

- [C13] 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
- [C14] **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
- [C15] **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
- [C16] 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
- [C17] **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

Peer Reviewed Extended Abstracts

- [W1] **Tejas Gokhale**. Towards Robust Visual Understanding: from Recognition to Reasoning. (to appear) In AAAI 2024. AAAI New Faculty Highlights
- [W2] 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. 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[‡], 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[‡], **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[‡], 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> 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[‡], **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
- [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

Books and Monographs

- [B1] *Advances in Multi-Modal Information Retrieval and Generation*
(pre-publication) Springer
- [B2] *Advances in Robust Learning for 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*
(US Patent App. 63/468,653)

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 [C5])	Ph.D. CS [current], ASU
	• Agneet Chatterjee	Ph.D. CS [current], ASU
	MS (Thesis) Students	
	• Neel Patel	M.S. CS [current] UMBC
	• Varun Magotra	M.S. CS [current] UMBC
	MS (Thesis) Students (before UMBC)	
	• Maitreya Patel (see publication [C5])	M.S. CS 2022 [thesis]
	• Abhishek Chaudhary (see publication [C6])	M.S. CS 2021 [thesis]
	Undergraduate Advisees	
	• UMBC CWIT Scholar: Danielle Burton	2023-24
	Undergraduate Students (before UMBC)	
	• 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), AAAI New Faculty Highlights	02/2024
	<i>“Towards Robust Visual Understanding: from Recognition to Reasoning”</i> [website]	
	(Lightning Talk), IARPA Video-LINCS Proposers Day	02/2024
	<i>“Robust Visual Understanding: Knowledge-Guided and Multimodal Reasoning”</i>	
	(Tutorial), Winter Conference on Applications of Computer Vision	01/2024
	<i>“Challenges with Evaluation of Text-to-Image Models”</i> [website]	
	(Invited Talk), PRG Seminar, UMIACS (University of Maryland)	11/2023
	<i>“Robust Visual Understanding in the Multimodal Era”</i>	
	(Invited Talk) <i>“Towards Reliable Semantic Vision”</i>	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
	<i>“Semantic Data Engineering for Robustness Under Multimodal Settings”</i> [website]	
	(Invited Talk) University of Illinois at Chicago	10/2022

“Robust Semantic Vision”

(Invited Talk) Microsoft Research	10/2022
<i>“Benchmarking Spatial Relationships in Text-to-Image Generation”</i>	
(Doctoral Consortium) CVPR, New Orleans	06/2022
<i>“Discovering Transformations for Generalization in Semantic Vision”</i>	
(Guest Lecture) Arizona State University CSE 598	03/2022
<i>“Introduction to Generalization in Semantic Vision”</i>	
(Invited Talk) Arizona State University ML Club	09/2021
<i>“Robust Visual Understanding”</i>	
(Doctoral Consortium), IJCAI, Macao	08/2019
<i>“Vision Beyond Pixels”</i>	
(Tutorial) Telluride Neuromorphic Cognition Engineering Workshop,	07/2019
<i>“Reasoning about Objects and Actions via Block-Play”</i>	
(Invited) Birla Institute of Technology and Science (BITS Pilani)	04/2018
<i>“Deep Learning Methods in Imaging and Computer Vision”</i>	

ACADEMIC
SERVICE

Area Chair:

- North American Chapter of the ACL (NAACL) 2024

Reviewer / Program Committee:

- Conference on Computer Vision and Pattern Recognition (CVPR) 2023-24
- International Conference on Computer Vision (ICCV) 2023
- International Conference on Machine Learning (ICML) 2023-24
- 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) 2022-24
- Association for Computational Linguistics (ACL) 2021-24
- Empirical Methods in Natural Language Processing (EMNLP) 2021-23
- North American Chapter of the ACL (NAACL) 2021-23
- 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) 2020-24
- IEEE Transactions of Pattern Analysis and Machine Intelligence (T-PAMI) 2024
- Springer Machine Vision and Applications (MVAP) 2020

Award Committee:

- Best Student Abstract Award Committee, AAAI 2024

Leadership:

- 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):**

- PPR Seminar: Advances in Perception, Prediction, and Reasoning [\[Website\]](#)
- Undergraduate Student Advisor Fall 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

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