

TEJAS GOKHALE

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RESEARCH INTERESTS

I work on computer vision, machine learning, and natural language processing – very often at their wonderful intersection. My focus is “*semantic vision*”, i.e. building systems that assign meaning to scenes captured by cameras. My domain expertise lies in devising adversarial machine learning algorithms for tackling situations such as domain shift, semantic shift, signal corruptions, etc. as well as learning to discover useful data transformations that can improve the diversity of training data. I am also interested in developing frameworks for benchmarking and analyzing the robustness, reliability, and generalizability of semantic vision systems.

EDUCATION

Doctor of Philosophy, Arizona State University 2018–present
School of Computing and Augmented Intelligence
Advisors: Yezhou Yang, Chitta Baral

Master of Science, Carnegie Mellon University 2017
Department of Electrical and Computer Engineering
Advisor: Aswin C. Sankaranarayanan

Bachelor of Engineering (Honours), Birla Institute of Technology and Science 2015
Department of Electrical and Electronics Engineering

PUBLICATIONS

My work has been published at several premier AI venues such as AAAI (h5-index: 180); computer vision conferences: ICCV (h5-index: 239), ECCV (h5-index: 186), WACV (h5-index: 76); natural language processing conferences: ACL (h5-index: 169), EMNLP (h5-index: 154), NAACL (h5-index: 105).

📄 Conference Proceedings (5 ACL, 2 AAAI, 2 EMNLP, 1 ECCV, 1 ICCV, 1 NAACL, 1 WACV)

- [C1] *Improving Diversity with Adversarially Learned Transformations for Domain Generalization*
T. Gokhale, R. Anirudh, J. Thiagarajan, B. Kailkhura, C. Baral, Y. Yang
<https://arxiv.org/abs/2206.07736> to appear in WACV 2023
- [C2] *CRIPP-VQA: Counterfactual Reasoning about Implicit Physical Properties via Video Question Answering*
M. Patel, T. Gokhale, C. Baral, Y. Yang to appear in EMNLP 2022
- [C3] *Semantically Distributed Robust Optimization for Vision-and-Language Inference*
T. Gokhale, A. Chaudhary, P. Banerjee, C. Baral, Y. Yang
<https://arxiv.org/abs/2110.07165> ACL Findings 2022
- [C4] *Generalized but not Robust? Comparing the Effects of Data Modification Methods on Out-of-Domain Generalization and Adversarial Robustness*
T. Gokhale, S. Mishra, M. Luo, B. Sachdeva, C. Baral
<https://arxiv.org/abs/2203.07653> ACL Findings 2022

- [C5] *Unsupervised Natural Language Inference Using PHL Triplet Generation*
N. Varshney, P. Banerjee, **T. Gokhale**, C. Baral
<https://arxiv.org/abs/2110.08438> ACL Findings 2022
- [C6] *To Find Waldo You Need Contextual Cues: Debiasing Who's Waldo*
Y. Luo, P. Banerjee, **T. Gokhale**, Y. Yang, C. Baral
<https://arxiv.org/abs/2203.16682> ACL 2022
- [C7] *Improving Biomedical Information Retrieval with Neural Retrievers*
M. Luo, A. Mitra, **T. Gokhale**, C. Baral
<https://arxiv.org/abs/2201.07745> AAAI 2022
- [C8] *Weakly Supervised Relative Spatial Reasoning for Visual Question Answering*
P. Banerjee, **T. Gokhale**, Y. Yang, C. Baral
<https://arxiv.org/abs/2109.01934> ICCV 2021
- [C9] *WeaQA: Weak Supervision via Captions for Visual Question Answering*
P. Banerjee, **T. Gokhale**, Y. Yang, C. Baral
<https://arxiv.org/abs/2012.02356> ACL Findings 2021
- [C10] *Self-Supervised Test-Time Learning for Reading Comprehension*
P. Banerjee, **T. Gokhale**, C. Baral
<https://arxiv.org/abs/2103.11263> NAACL 2021
- [C11] *Attribute-Guided Adversarial Training for Robustness to Natural Perturbations*
T. Gokhale, R. Anirudh, B. Kailkhura, J. Thiagarajan, C. Baral, Y. Yang
<https://arxiv.org/abs/2012.01806> AAAI 2021
- [C12] *Mutant: A Training Paradigm for Out-of-Distribution Generalization in Visual Question Answering*
T. Gokhale, P. Banerjee, C. Baral, Y. Yang
<https://arxiv.org/abs/2009.08566> EMNLP 2021
- [C13] *Video2commonsense: Generating commonsense descriptions to enrich video captioning*
Z. Fang*, **T. Gokhale***, P. Banerjee, C. Baral, Y. Yang
<https://arxiv.org/abs/2003.05162> EMNLP 2021
- [C14] *VQA-LOL: Visual question answering under the lens of logic*
T. Gokhale, P. Banerjee, C. Baral, Y. Yang
<https://arxiv.org/abs/2002.08325> ECCV 2020

🕒 Workshop Proceedings

(2 CVPR)

- [W1] *Halluci-Net: Scene Completion by Exploiting Object Co-occurrence Relationships*
K. Kulkarni, **T. Gokhale**, R. Singh, P. Turaga, A. Sankaranarayanan
<https://arxiv.org/abs/2004.08614> AI for Content Creation @ CVPR 2021
- [W2] *Cooking With Blocks: A Recipe for Visual Reasoning on Image-Pairs*
T. Gokhale, S. Sampat, Z. Fang, Y. Yang, C. Baral
Long version: <https://arxiv.org/abs/1905.12042> Vision Meets Cognition @ CVPR'19

🕒 Preprints

- [P1] *Poisoning of Image Classifiers via Selective Batch Sampling*
E. Wisdom, T. Gokhale, Y. Yang in review
- [P2] *Domain Interpolation Sensitivity for Characterizing Distribution Shift*
J. Feinglass, T. Gokhale, C. Baral, Y. Yang in review

🕒 Book Manuscript

- [B1] *Advances in Multi-Modal Information Retrieval*
(In Preparation) for Springer Nature Synthesis Lectures on Computer Vision

🕒 Grant Writing

I am actively involved in conceptualizing and writing grant proposals with my advisors. This proposed work builds upon contributions made by my PhD thesis.

- [1] *Decentralized Authorship Attribution*
PI: Chitta Baral *Submitted to IARPA, 2022*
- [2] *An Active Approach for Data Engineering to Improve Vision-Language Tasks*
PI: Yezhou Yang, Co-PI: Chitta Baral *Funded by NSF, 2021*

RESEARCH EMPLOYMENT

- 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
Research Scholar, [Machine Intelligence Group](#)
Mentor: Rushil Anirudh (+Jay Thiagarajan, Bhavya Kailkhura)
- Lawrence Livermore National Laboratory** Summer 2020
Research Scholar, [Machine Intelligence Group](#)
Mentor: Rushil Anirudh (+Jay Thiagarajan, Bhavya Kailkhura)
- Snapchat Research** Summer 2018
Research Intern, Computational Imaging Group
Mentor: Guru Krishnan & Shree Nayar
- Carnegie Mellon University** 2017–2018
Graduate Student Researcher, ECE Department
Advisor: Aswin Sankaranarayanan

INVITED TALKS

- Oct'22, (*Invited Talk*) "Robust Semantic Vision" University of Illinois at Chicago
- Oct'22, (*Invited Talk*) "Benchmarking Spatial Relationships in Text-to-Image Generation" Microsoft Research
- Mar'22, (*Guest Lecture*) "Introduction to Generalization in Semantic Vision" ASU CSE 598
- Sep'21, (*Invited*) "Robust Visual Understanding", ASU ML Club
- Aug'19, "Vision Beyond Pixels", IJCAI Doctoral Consortium, IJCAI 2019, Macao
- Jul'19, "Reasoning about Objects and Actions via Block-Play", Telluride 2019
- Apr'18, (*Invited*) "Deep Learning Methods in Imaging and Computer Vision", BITS Goa

TEACHING

Teaching Assistant, Arizona State University

CSE310: Data Structures & Algorithms

Spring 2020, ASU

CSE408: Multimedia Information Systems,

Spring 2019, ASU

CSE110: Introduction to Programming,

Fall 2018, ASU

Guest Lecturer, Arizona State University

CSE598, Perception in Robotics

Spring 2022

CSE408, Multimedia Information Systems

Spring 2019, ASU

Course Development

CSE591: Frontier Topics in Vision & Language

[\[YouTube\]](#) [\[website\]](#) Spring 2021

I was part of the team that designed this class as a series of (weekly) invited seminars, followed by paper reading, discussion, and brainstorming in the classroom.

Student Instructor, CTE: Advanced Image Processing,

Spring 2015, BITS Pilani

MENTORING

PhD Students

Ethan Wisdom (see publication [\[P1\]](#))

Ph.D. CS [current]

MS (Thesis) Students

Maitreya Patel (see publication [\[C2\]](#))

M.S. CS [current]

Huiliang Shao,

M.S. CE 2022 [current]

Abhishek Chaudhary (see publication [\[C3\]](#))

M.S. CS 2021 [\[thesis\]](#)

Capstone Mentor, mentored five B.S. CS students in projects on vision & language

AY 2019-20

Project Mentor, CSE598 - Perception in Robotics, ASU

Spring 2022

Project Mentor, CSE576 - Natural Language Processing, ASU

Fall 2018

SERVICE / LEADERSHIP

Program Committee / Conference Reviewer

NeurIPS: Advances in Neural Information Processing Systems

2022

ICLR: International Conference on Learning Representations

2022

AAAI: AAAI Conference on Artificial Intelligence

2021–2023

ECCV: European Conference on Computer Vision

2022

EMNLP: Conference on Empirical Methods in Natural Language Processing

2021–2022

ACL: Annual Meeting of the Association for Computational Linguistics

2021–2022

NAACL: North American Chapter of the Association for Computational Linguistics

2021–2022

WACV: IEEE Winter Conference on Applications of Computer Vision

2021–2023

ICRA: International Conference on Robotics and Automation

2019–2023

IROS: IEEE/RSJ International Conference on Intelligent Robots and Systems

2022

Journal Reviewer

RA-L: IEEE Robotics and Automation Letter

2020

MVAP: Springer Machine Vision and Applications

2020

Workshop Organizer

ODRUM: Workshop on Open-Domain Retrieval under Multi-Modal Settings,

CVPR 2022

[\[Website\]](#) [\[YouTube\]](#)

Organizer, 2021 Frontiers of V&L Seminar Series,
Founder, Summer Vision Reading Group,

[\[Website\]](#), [\[YouTube\]](#) ASU
[\[Website\]](#), multi-university initiative

Volunteer, 2019 Southwest Robotics Symposium,
Volunteer, International Conference on Machine Learning 2020,
Advisor, ASU Machine Learning Club,
Award Reviewer, GPSA Teaching Award Reviewer
Mentor, Graduate Student Mentorship Program,
Student Mentor, Peer Mentorship Program

Tempe AZ
Virtual
ASU
ASU
ASU
BITS Pilani

AWARDS AND RECOGNITION

| | |
|---|---|
| NeurIPS Top Reviewer | NeurIPS 2022 |
| CVPR 2022 Doctoral Consortium | CVPR 2022 |
| ICLR Best Reviewer | ICLR 2022 |
| SCAI Doctoral Fellowship (ASU), | 2020-2022 |
| Engineering Graduate Fellowship, (ASU Engineering), | 2020 |
| Graduate College Travel Award, (ASU), | for CVPR 2022, ICCV 2021, EMNLP 2020, ECCV 2020 |
| IJCAI 2019 Doctoral Consortium , | IJCAI 2019 |
| Inducted, IEEE Eta Kappa Nu, Sigma Chapter (CMU), | Jan 2017 |
| National Talent Scholarship (Govt. of India), | 2007–2015 |

REFERENCES

| | | | |
|--------------------------------|---------------------|--|--|
| Yezhou Yang | Associate Professor | Arizona State University | yz.yang@asu.edu |
| Chitta Baral | Professor | Arizona State University | chitta@asu.edu |
| Heni Ben Amor | Associate Professor | Arizona State University | hbenamor@asu.edu |
| Rushil Anirudh | Research Scientist | Lawrence Livermore National Laboratory | anirudh1@llnl.gov |