Abbavaram Gowtham Reddy

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https://gautam0707.github.io Google Scholar

Research Interests

Causality, Explainability, and Machine Learning
Summary:

- Out-of-distribution generalization under hidden confounding shift [2 x ICLR'26]
- Causal modeling of neural networks and causal explainable AI [AAAI'24, ICML'22]
- Causal representation learning and statistical causal inference [NeurIPS'24, AAAI'24, AAAI'22]
- Causality and large language models [ICLR'25, ICML'25]

Current Affiliation

Postdoctoral Researcher CISPA Helmholtz Center for Information Security, Saarbrücken, Germany — Oct 2024 – Present
Advisors: Dr. Rebekka Burkholz, Dr. Krikamol Muandet

Education

Ph.D. Indian Institute of Technology Hyderabad, India — Aug 2019 – Sep 2024
- Advisor: Prof. Vineeth N Balasubramanian
- Thesis: Bridging Causal Inference and Neural Network Models: Methods and Applications
- Coursework CGPA: 9.38/10.0

M.Tech JNTU Hyderabad, India — Sep 2013 – Sep 2015
- Computer Science and Engineering, CGPA: 7.78/10.0

B.Tech JNTU Anantapur, India — Apr 2008 – Apr 2012
- Computer Science and Engineering, CGPA: 7.37/10.0

Publications

2026

- Abbavaram Gowtham Reddy, Celia Rubio-Madrigal, Rebekka Burkholz, Krikamol Muandet, When Shift Happens - Confounding Is to Blame, International Conference on Learning Representations (**ICLR**) 2026.
- Abbavaram Gowtham Reddy, Rajeev Verma, Celia Rubio-Madrigal, Krikamol Muandet, Rebekka Burkholz, Boosting for Predictive Sufficiency, International Conference on Learning Representations (**ICLR**) 2026.

2025

- Hari Chandana Kuchibhotla, Sai Srinivas Kancheti, Abbavaram Gowtham Reddy, Vineeth N Balasubramanian, Efficient Vocabulary-Free Fine-Grained Visual Recognition in the Age of Multimodal LLMs, Transactions on Machine Learning Research (**TMLR**) 2025.
- Aniket Vashishtha, Abhinav Kumar, Atharva Pandey, Abbavaram Gowtham Reddy, Kabir Ahuja, Vineeth N. Balasubramanian, Amit Sharma, Teaching Transformers Causal Reasoning through Axiomatic Training. International Conference on Machine Learning (**ICML**) 2025.
- Aniket Vashishtha, Abbavaram Gowtham Reddy, Abhinav Kumar, Saketh Bachu, Vineeth N. Balasubramanian, Amit Sharma, Causal Order: The Key to Leveraging Imperfect Experts in Causal Inference. International Conference on Learning Representations (**ICLR**) 2025. ,

2024

- Abbavaram Gowtham Reddy, Vineeth N Balasubramanian, Detecting and Measuring Confounding Using Causal Mechanism Shifts. Conference on Neural Information Processing Systems (**NeurIPS**) 2024. ,

- Abbavaram Gowtham Reddy, Vineeth N Balasubramanian, NESTER: An Adaptive Neurosymbolic Method for Causal Effect Estimation, AAAI Conference on Artificial Intelligence (**AAAI**) 2024.
- Abbavaram Gowtham Reddy, Saketh Bachu, Harsharaj Pathak, Benin Godfrey L, Varshaneya V, Sathyanarayan Kar, Vineeth N Balasubramanian, Towards Learning and Explaining Indirect Causal Effects in Neural Networks. AAAI Conference on Artificial Intelligence (**AAAI**) 2024.
- Hari Chandana Kuchibhotla, Sai Srinivas Kancheti, Abbavaram Gowtham Reddy, Vineeth N Balasubramanian, Semantic Alignment for Prompt-Tuning in Vision Language Models, Transactions on Machine Learning Research (**TMLR**) 2024.
- Ziheng Chen, Jia Wang, Jun Zhuang, Abbavaram Gowtham Reddy, Fabrizio Silvestri, Jin Huang, Kaushiki Nag, kun Kuang, Xin Ning, Gabriele Tolomei. Debiasing Machine Unlearning with Counterfactual Examples. Preprint.

2022

- Abbavaram Gowtham Reddy*, Sai Srinivas Kancheti*, Vineeth N Balasubramanian, Amit Sharma, Matching Learned Causal Effects of Neural Networks with Domain Priors. International Conference on Machine Learning (**ICML**) 2022.
- Abbavaram Gowtham Reddy, Benin Godfrey L, Vineeth N Balasubramanian, On Causally Disentangled Representations, AAAI Conference on Artificial Intelligence (**AAAI**) 2022.
- Abbavaram Gowtham Reddy*, Saloni Dash*, Amit Sharma, Vineeth N Balasubramanian, Counterfactual Generation Under Confounding, NeurIPS workshop on CML4Impact, 2022.
- Abbavaram Gowtham Reddy, Benin Godfrey L, Vineeth N Balasubramanian, CANDLE: An Image Dataset for Causal Analysis in Disentangled Representations, Best paper award at CVPR 2021 workshop on Causality in Vision.
- Abbavaram Gowtham Reddy, Causality in Neural Networks, Extended Abstract AIES 2021.

Awards, Honors, and Fellowships

- Recognized as a top reviewer at NeurIPS 2025 conference
- Research excellence award from IIT Hyderabad for the academic year 2024 - 2025
- DAAD AI-net fellowship for the Germany postdoc networking in AI 2024
- Research excellence award from IIT Hyderabad for the academic year 2022 - 2023
- Prime minister research fellowship (PMRF), Sep 2020 - Jul 2023
- Fearless problem solver by EPAM India in 2018
- Junior research fellowship (JRF) in 2015 and 2016 awarded by University Grants Commission (UGC) India
- Assistant professorship in 2013, 2014, 2015 awarded by University Grants Commission (UGC) India

Research Services

- Co-organizer of the Rational Intelligence Seminar Series (Jun 2025 - Present) at CISPA.
- Reviewer: TMLR, ICML'26, ICLR'25, NeurIPS'25 (Top Reviewer), ICML'25, AAAI'24, AAAI'23, ICML'22, CVPR'22, WACV'22, ACML'21
- Sub-reviewer: ECCV'24, AISTATS'24, ICML'23, ICLR'23, ICLR'22, NeurIPS'21, CVPR'21, NeurIPS'20, ECCV'20, BMVC'20
- Volunteer: ACML'22

Work Experience

- Software Engineer at EPAM India, Hyderabad. Sep 2015 - Jul 2018
- Research Intern at Microsoft Research India, Bengaluru. Jul 2022 - Oct 2022

Invited Talks

"Predictive Sufficiency for Generalization Under Hidden Confounding Shift" — presented as part of the seminar series AI-Powered Innovation: Integrating Future-Ready Technologies in Real-World Applications. NIT Jalandhar, India, Nov 2025

Research Forums Attended and Presentations

- NeurIPS Conference - Dec 2025, San Diego, USA
- Google research week - Feb 2024, India, poster presentation
- Amazon research days - Dec 2023, India, poster presentation
- Google research week - Jan 2023, India
- Amazon research days - Nov 2022, India, poster presentation

Teaching and Mentoring

- I worked as a teaching assistant for the following courses at IIT Hyderabad: Deep Learning for Computer Vision (2020), Causal Inference (2021), Introduction to Programming (2023)
- I taught the following courses as part of the PMRF fellowship: Mathematical Foundations of Machine Learning at BVRIT, Hyderabad (2022), Machine Learning at PSG College, Coimbatore (2021), and Basics of Computer Science at SV College of Engineering, Tirupati (2021)
- I delivered several tech talks on machine learning and Python during my tenure at EPAM India (2015–2018)