

GOWTHAMI SOMEPALLI

College Park, Maryland, USA

voice: (+1) 475-228-4318 · email: gowthami@umd.edu

web: <https://somepage.github.io>

RESEARCH INTERESTS

My research is focused on understanding the failure modes of deep learning models, both discriminative and generative. Lately, my efforts have primarily centered on understanding multimodal generative models, particularly Text-to-Image Diffusion models and Video Language Models.

EDUCATION

University of Maryland, College Park

Aug. 2019 - Present

M.S. + Ph.D. in Computer Science (4.0/4.0)

Ann Wylie Doctoral Fellowship, Kulkarni fellow, Amazon Internship Fellowship

Advisor: [Tom Goldstein](#)

Indian Institute of Technology Madras

Aug. 2006 - Dec. 2011

Bachelors + Masters in Mechanical Engineering

Advisor: [Raghu Prakash](#)

SELECTED PUBLICATIONS

Visit my Google Scholar [T2ezBDsAAAAJ](#) for complete list

- Understanding and Mitigating Copying in Diffusion Models [NeurIPS](#), 2023
G. Somepalli, V. Singla, M. Goldblum, J. Geiping, T. Goldstein
- Battle of the backbones: A large-scale comparison of pretrained models across CV tasks [NeurIPS](#), 2023
M. Goldblum, H. Souri, R. Ni, M. Shu, V. Prabhu, **G. Somepalli**, P. Chattopadhyay, M. Ibrahim, A. Bardes, J. Hoffman, R. Chellappa, AG Wilson, T Goldstein
- A Performance-Driven Benchmark for Feature Selection in Tabular Deep Learning [NeurIPS](#), 2023
V. Cherepanova, R. Levin, **G. Somepalli**, J. Geiping, CB. Bruss, AG Wilson, T. Goldstein, M. Goldblum
- Baseline defenses for adversarial attacks against aligned language models [web](#), 2023
N. Jain, Y. Wen, **G. Somepalli**, J. Kirchenbauer, P.Y. Chiang, M. Goldblum, A. Saha, J. Geiping, T. Goldstein
- Diffusion Art or Digital Forgery? Investigating Data Replication in Diffusion Models [CVPR](#), 2023
G. Somepalli, V. Singla, M. Goldblum, J. Geiping, T. Goldstein [TechCrunch coverage - link](#)
- How much Data is Augmentation Worth? [web](#), ICLR 2023
J. Geiping, **G. Somepalli**, R. Schwartz-Ziv, A. G. Wilson, T. Goldstein, M. Goldblum
- Investigating Reproducibility and Double Descent from the DB Perspective [web](#), CVPR (Oral) 2022
G. Somepalli, L. Fowl, A. Bansal, P. Yeh-Chiang, Y. Dar, R. Baraniuk, M. GoldBlum, T. Goldstein
- SAINT: Improved NNs for Tabular Data via Row Attention and Contrastive PT [web](#), NeurIPS TRLW 2022
G. Somepalli, M. Goldblum, A. Schwarzschild, C.B. Bruss, T. Goldstein [350+ stars on Github](#)
- PatchGame: Learning to Signal Mid-level Patches in Referential Games [web](#), NeurIPS 2021
K. Gupta, **G. Somepalli**, Anubhav, V. Jayasundara, M. Zwicker, A. Shrivastava
- Unsupervised Anomaly Detection with Adversarial Mirrored AutoEncoders [web](#), UAI (Oral) 2021
G. Somepalli, Y. Wu, Y. Balaji, B. Vizumuri, S. Feizi
- FUGUE : Characterizing functional genes across human tissues [web](#), PLOS CompBio 2021
G. Somepalli, S. Sahoo, S. Hannenhalli
- Adversarial Training against Poisons and Backdoors (pre-print) [web](#), 2021
J. Geiping, L. Fowl, **G. Somepalli**, M. Goldblum, M. Moeller, T. Goldstein

WORK EXPERIENCE

Meta AI

2023 – 2023

Research Internship

New York, NY

- Long video understanding with LLMs. Curated instruction data and trained a video LLM from scratch with interleaved vision and text tokens. Improved bert-score performance on Movie dataset over baseline by a significant amount. Work in progress.

Amazon AWS AI

2022 – 2022

Summer Internship

Pasadena, CA

- Improving the consistency of deep learning models for object detection and classification tasks.

Flipkart

Business Manager - Sell side

2017 - 2018

Bengaluru, India

- Led the demand planning and forecasting for the TV category; revamped the legacy data collection and modeling techniques. Reduced the overstocking of TVs by 15% and reduced the lost potential sales due to out-of-stock issues by 10% within my 6 months of joining.
- Won Annual **Business Excellence Award** for the most business growth via product innovation.

Poolka Technologies

Cofounder

2015-2017

Bengaluru, India

Poolka provides scalable visual recognition APIs to developers & businesses.

- Built **Fairi**, a fashion assistant chatbot that provides fashion recommendations based on social media trends and users' existing wardrobe. Iterated & improved the product with 2000+ beta users.
- Selected for **Microsoft Bizspark** and **IBM Global Entrepreneur Program**. (>\$20000 cloud credits per year)

General Electric, Oil & Gas

Engineer/ Synergy Leader

2013 - 2015

Bengaluru, India

As a technologist in GE, I worked primarily on following two projects -

- Upgrading reciprocating compressors (RC) for Petrochemical plants - Led team that designed and validated various RC components. Awarded **Project of the Quarter** (Oct 2014- Dec 2014) and the automation work on Torsional Vibration Analysis won **Kaizen Award** (Mar 2015).
- GE-Cameron Synergy - Was single point of contact in Bangalore during the GE acquisition of Cameron. Performed Root Cause Analysis (RCA) for multiple Cameron products. Was accoladed by Senior management – GE Oil & Gas, Italy for my role in the synergy.

Renault-Nissan India

Engineer/ Component Leader

2011 - 2013

Chennai, India

- Led Engine Mounting Team for Renault Duster and Renault Lodgy Indian releases. Led components unification initiative between Renault and Nissan vehicles reducing the cost per part by 25%. Designed and tested the Rear AC for Renault Duster and Nissan Terrano Indian variations.

INVITED TALKS

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| • WACV tutorial - Mitigating Data Replication in Diffusion Models | Jan 2024 |
| • NeurIPS Diffusion workshop - Mitigating Data Replication in Diffusion Models | Dec 2023 |
| • ICML GenLaw workshop - Understanding Data Replication in Diffusion Models | July 2023 |
| • Google DeepMind - Understanding Data Replication in Diffusion Models | Aug 2023 |
| • TikTok US - Understanding Data Replication in Diffusion Models | May 2023 |
| • ML Collective - Understanding Data Replication in Diffusion Models | Mar 2023 |
| • WiML workshop @NeurIPS - Investigating Reproducibility from the DB Perspective | Nov 2022 |
| • G-Research, UK - SAINT: Transformers for tabular data. | Nov 2022 |
| • Google Research, India - Can Neural Nets Learn the Same Model Twice? | Apr 2022 |
| • TOPML Workshop - Investigating Double Descent from the DB Perspective. | Mar 2022 |
| • ML Seminar Series, UMD - Transformers for Vision - a mini survey. | Oct 2021 |
| • Headstart, Bengaluru - Learnings from running a B2B tech startup in India. | 2017 |

MISCELLANEOUS

- | | |
|---|--------------|
| • Kulkarni fellowship for summer research (web). | 2021 |
| • Reviewer - NeurIPS, ICLR, CVPR | 2022-Present |
| • Founder of @MLSummaries twitter and medium accounts. 4000+ followers. | 2021-Present |
| • Initiated student-led Machine Learning Seminar Series, UMD. | 2021-Present |
| • Mentor: Tech + Research program in Technica. | 2020, 2023 |
| • Master's research Scholarship by Ministry of Human Resources and Development, Govt. of India. | May 2010 |
| • National Talent Search Exam Scholarship by Govt. of India. | 2005-11 |
| • Prathibha Award by Andhra Pradesh State Govt. | 2003 |