Gowthami Somepalli

📧: **gowthami.somepalli@gmail.com**
🔗: **https://somepago.github.io**

Research Interests

I am interested in theoretical and applied research in Machine Learning.

Education

UNIVERSITY OF MARYLAND, COLLEGE PARK * 2019 - PRESENT

- Ph. D. + Masters in Computer Science (2019 - Present) - GPA - 4.0/4.0
- Teaching Assistant - Intro. to Data Science (Spring' 20), Machine Learning (Fall'20)

INDIAN INSTITUTE OF TECHNOLOGY MADRAS * 2006 - 2011

- M. Tech. in Product Design
- B. Tech. in Mechanical Engineering
- Minor, Operations Research

Publications

- J. Geiping, L. Fowl, **G. Somepalli**, M. Goldblum, M. Moeller, T. Goldstein - What Doesn't Kill You Makes You Robust(er): Adversarial Training against Poisons and Backdoors, Accepted to ICLR 2021 Workshop on Security and Safety in Machine Learning Systems, preprint link
- **G. Somepalli**, Y. Wu, Y. Balaji, B. Vizumuri, S. Feizi - Unsupervised Anomaly Detection with Adversarial Mirrored AutoEncoders, *Under review,* preprint link
- **G. Somepalli**, S. Sahoo, S. Hannenhalli - FUGUE : Characterizing functional genes across human tissues, *Under Review, (also appeared at WiML workshop NeurIPS 2019),* preprint link
- **G.Somepalli**, P. Pope, S. Feizi - Adversarial Robustness of Deep Inpainting Models, preprint link

Experience

RESEARCHER - NCI / UNIVERSITY OF MARYLAND, COLLEGE PARK * 2018 - 2019

Worked with Dr. Hannenhalli on understanding the tissue-level function of genes, synthetic lethality in the context of selective cancer therapy and cancer development using single-cell data .

- Developed a supervised machine learning model to rank genes in a specific tissue in terms of functionality. The model uses tissue-specific expression-derived and network-derived features.
- Worked on a model to predict trigger mutations in cancer development using single-cell data.

MANAGER - SELL SIDE (TELEVISIONS), FLIPKART * BANGALORE * 2017 - 2018

- Led the demand planning & 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.
- Built a dynamic pricing model based on inventory levels & competition in R using prophet.
- Won Annual ***Business Excellence Award*** for most business growth via product innovation.

CO-FOUNDER, POOLKA TECHNOLOGIES * BANGALORE * 2015 - 2017

At Poolka we built Fairi, an AI powered Fashion Assistant. In process of building Fairi, we rolled out multiple stand-alone APIs.

- Designed Fairi chatbot and app, that learns from images of tastemakers across web, to provide recommendations on clothing. Iterated & improved product with 2000 beta users. Developed the internal systems for content curation, crawling, tagging and analytics.
- Initiated look alike customer modeling to optimize for audiences using signals from tracking tools on all social media channels. Achieved an all-time-best of Rs.5/ lead.
- Selected for ***Microsoft Bizspark Global Program*** ($9000 Azure credits per year), ***IBM Global Entrepreneur Program*** ($12000 IBM cloud credits per year), ***Entrepreneur in Residence*** Program at Kalaari Capital.

ENGINEER/SYNERGY LEADER, GE OIL & GAS * BANGALORE * 2013 - 2015

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.

ENGINEER/COMPONENT LEADER, RENAULT-NISSAN INDIA * CHENNAI * 2011 - 2013

As an engineer in Renault-Nissan India, I

- Led Engine Mounting Team for Renault Duster and Renault Lodgy Indian releases. Led components unification initiative between Renault & Nissan vehicles reducing the cost per part by 25%. Designed & tested the Rear AC for Renault Duster & Nissan Terrano Indian variations.
- Won ***Best Individual contributor*** from Chassis team in 2013 & my team won ***Indigenous design award*** for Rear AC in 2012.

Academic Projects

POSITIVE UNLABELED LEARNING (WITH PROF. SOHEIL FEIZI)

- Developed PU-VAE, a deep generative approach to sample from positive and negative distribution in absence negative labeled examples and very few positive labeled examples (less than 2% of the dataset). Used labeled examples generated from PU-VAE to train a classifier to improve upon SOTA cost sensitive classification on positive unlabeled data by over 15 absolute percent points.

DRUG SIDE-EFFECT PREDICTION (WITH PROF. HECTOR C. BRAVO)

- Built a self-attention based approach to predict Adverse Side Reactions (ADRs). The neural network model exploits know drug protein reactions and protein protein reactions and can be used to predict ADRs in the early stages of drug development. Improved SOTA approaches by 2% AUPRC. Code and a new large drug side effect dataset to be released post acceptance of manuscript.

Courses & Skills

- Advanced Numerical Optimization, Theoretical Deep Learning, Computational Linguistics, Visual Learning and Recognition, Computational and Mathematical Analysis of Biological Networks, Design and Analysis of Algorithms, Game theory
- Programming - Python, PyTorch, R, Matlab, C
- Web development - Flask, HTML, Javascript, Bootstrap, AngularJS, jQuery