Arpit Bansal

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Research Interests

My broad research interest lies in understanding and improving the way Deep Neural Networks train and perform inference. My research work ranges from making neural networks to extrapolate their knowledge to solve harder problems with more time to watermarking neural networks to understanding neural networks behaviors. Currently I am working on understanding diffusion models and adopting them to solve different AI tasks.

Education

University of Maryland, College Park — *College Park*
PhD in Computer Science $(4.0/4.0)$ — *Jan 2021 - present*
- Advisor: Prof. Tom Goldstein
- Dean's Fellowship

Indian Institute of Technology, Kharagpur — *Kharagpur, India*
Bachelors + Masters in Electrical Engineering — *Aug 2014 - May 2019*
- Minor in Computer Science
- Advisor: Prof. Rajiv Ranjan Sahay

Industry Experience

July 2019 - Dec 2020	**Software Developer**, Visa Incorporated, India
May 2018 - July 2018	**Software Developer Intern**, Visa Incorporated, India
May 2017 - July 2017	**Software Developer Intern**, Fission Labs, India

Publications

Can You Learn the Same Model Twice? Investigating Reproducibility and Double Descent from the Decision Boundary Perspective
G. Somepalli, L. Fowl, **A. Bansal**, P. Yeh Chiang, Y. Dar, R. Baraniuk, M.GoldBlum, T. Goldstein
Conference on Computer Vision and Pattern Recognition (CVPR) 2022

Certified Neural Network Watermarks with Randomized Smoothing
A. Bansal, P. Yeh Chiang, M. Curry, R. Jain, C. Wigington, V. Manjunatha, J. P Dickerson, T. Goldstein
International Conference on Machine Learning (ICML) 2022

Preprints

A. Bansal, M. Goldblum, V. Cherepanova, A. Schwarzschild, C Bayan Bruss, T. Goldstein, *MetaBalance: High-Performance Neural Networks for Class-Imbalanced Data*

A. Bansal, A. Schwarzschild, E. Borgnia, Z. Emam, F. Huang, M. Goldblum, T. Goldstein, *Thinking Deeper With Recurrent Networks: Logical Extrapolation Without Overthinking*

A. Schwarzschild, E. Borgnia, A. Gupta, **A. Bansal**, Z. Emam, F. Huang, M. Goldblum, T. Goldstein, *Datasets for studying generalization from easy to hard examples*

L. Fowl, P. yeh Chiang, M. Goldblum, J. Geiping, **A. Bansal**, W. Czaja, T. Goldstein, *Preventing unauthorized use of proprietary data: Poisoning for secure dataset release*

A. Bansal, S. Jonna, R. R Sahay, *Pag-net: Progressive attention guided depth super-resolution network*

Teaching Experience

Fall 2021 **Control Systems**, Teaching Assistant — *University of Maryland, College Park*
Spring 2021 **Operating Systems**, Teaching Assistant — *University of Maryland, College Park*

Relevant Course-work

Machine Learning Information Retrieval (IIT), Machine Learning (IIT), Speech and NLP (IIT), Deep Learning (UMD) Algorithms in Machine Learning (UMD)

Signal Processing Digital Signal Processing (IIT), Statistical Signal Processing (IIT), Probability and Stochastic Processes (IIT), Random Processes (UMD), Information Theory (UMD), Numerical Analysis I (UMD), Advanced Numerical Optimization (UMD)