Dhruv Srikanth

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Who Am I?...

- CS graduate student at the University of Chicago, Research Assistant at the UChicago Booth Center for Applied Artificial Intelligence. Looking for roles in Software Engineering, AI, and Research at companies that take a practical engineering approach to innovation and impact.
- Areas of interest: Deep Learning, High Performance Computing, Game Theory. Specifically, generative frameworks (e.g. GAN, VAE, DDPMs), energy-based models (EBMs) and self-supervised learning (SSL).
- Recent personal projects: **PyNN** (Deep Learning Framework) [code], **GAN Experimentation Packages** [code], **Neural style transfer CLI tool** [code], **Tweet-driven LSTM forecasting framework for Tesla's stock price** [code], **Distributed GPU based Monte Carlo Ray Tracing Simulation** [code].
- What excites me about machine learning is its infancy and novelty. What drives me is the potential to create impactful solutions through data-centric algorithms and a little fun with math.

Education

University of Chicago
Chicago, USA

Master of Science in Computer Science, Specializing in High Performance Computing - GPA: 3.68   *Sept 2021 – Apr 2023*

PES University
Bangalore, India

Bachelor of Technology in Electronics and Communication Engineering, Specializing in Signals & Systems - GPA: 8.87 (First Class Distinction)   *Aug 2017 – June 2021*

Technical Coursework Deep Learning · Machine Learning · Neural Networks · Computational Learning Theory · Algorithms · High Performance Computing · Parallel Programming · Compilers · Applied Data Analysis · Digital Signal Processing · Advanced Image Processing · Linear Algebra

Languages Python · C/C++ · Go · CUDA · MPI (Distributed Memory Parallelism) · OpenMP (Shared Memory Parallelism) · MATLAB · Java · SQL · JavaScript

Frameworks PyTorch · TensorFlow · Keras · Pandas · Sklearn · NumPy · Dash (Flask) · NodeJS · Azure · LLVM · Unix · Slurm · Bash

Experience

UChicago Booth Center for Applied Artificial Intelligence
Chicago, USA

Researcher (Full-Time Internship), Research Assistant (Part-Time), Faculty Advisor: Dr. Sendhil Mullainathan   *Apr 2022 – Present*

- **Empirically proved presence of inductive biases** (inherent correlations between covariates – race, gender) in pretrained (ImageNet) weights and ubiquitous CNN model architectures (AlexNet, VGG, ResNet, DenseNet).
- **Developing an expert coding language and API** that models user information as a dynamic knowledge graph for information generation based on a contextual understanding of the user. Used in creating Wikipedia-like pages with automatic content generation based on user's knowledge base.
- Developed PyTorch templates for end-to-end computer vision training pipeline.

Myelin Foundry
Bangalore, India

Machine Learning Intern   *Jan 2021 – July 2021*

- **Created real-time AI framework (dashboard)** towards shaping policymaking utilizing sentiment analysis and topic modeling - Latent Dirichlet Allocation.
- **Developed real-time competitor analysis tool** creating new revenue streams by extrapolating writing style and engagement on articles using Beautiful Soup. **Developed and deployed full stack for both tools** using Python, MySQL, HTML, CSS, JavaScript, Flask and shell scripts on Azure VMs.
- Obtained **87% out of sample accuracy** on constructed pseudo-YOLOv5 model for object detection.

Outdu Mediatech
Bangalore, India

Deep Learning Intern   *June 2020 – Aug 2020*

- Implemented **real-time depth map generation with threshold accuracy of 98%** through monocular depth estimation using transfer learning on U-Net style CNN and DenseNet169.
- Designed a novel quantitative method to estimate depth values as a distance measure.
- Formulated model for depth map synthesis and depth-to-distance conversion **deployed in spatial positioning and thresholding applications** (ensuring social distancing). Facilitated using TensorFlow 2.0.

General Electric Healthcare
Bangalore, India

GE Healthcare Intern   *July 2019 - Aug 2019*

- Determined factors causing defects in X-ray manufacturing process through exploratory data analysis on Acero and Perenna X-ray insert models utilizing Pandas and sklearn.
- Developed defective X-ray identification model utilizing Random Forest regression and Naïve Bayes classification via sklearn.
- Models **deployed for quality assurance tests and root cause analysis** achieving **out of sample accuracy of 84%.**

Publication and Research

Suraj Bidnur, Dhruv Srikanth, Sanjeev Gurugopinath, "**Resource-Conscious High-Performance Models for 2D-to-3D Single View Reconstruction**", in IEEE Region 10 Conference, 2021. [paper] [code]

Machine Learning Based 2D-3D Reconstruction
Bangalore, India

Faculty Advisor: Dr. Sanjeev Gurugopinath   *May 2020 – Sept 2021*

- **Increased performance of 2D-to-3D single-view reconstruction by 29%** compared to state-of-the-art models via survey of evolving 2D-to-3D reconstruction techniques, existing image/signal processing methods, machine learning, and deep learning architectures.
- Implemented 3D CNN autoencoder models (with and without gated RNN units) as baselines for single and multi-view 3D voxel reconstruction.
- **Optimized performance and resource utilization tradeoff** between dense and skip connections in an asymmetric autoencoder.
- Empirically determined optimal loss functions (Binary Cross-Entropy) and architectures (autoencoder, VAE and GAN) for efficient 3D reconstruction.