Arun Patro

+1-332-248-6212 | arun.patro@nyu.edu | arunpatro.com | linkedin.com/in/arunpatro

Education

NYU Courant Institute of Mathematical Sciences

Masters in Computer Science — *Sep 2022 – Present*

- Key Courses: Programming Languages, Natural Language Processing, Bayesian Machine Learning, Deep Reinforcement Learning, Computer Graphics, Multi-core systems, Cryptocurrencies and Blockchains, Operating Systems

Indian Institute of Technology, Kharagpur

B.Tech. + M.Tech. in Electrical Engineering (Signal Processing) — *Jul 2013 – Apr 2018*

- Key Courses: Image Processing, Machine Learning, Deep Learning, Digital Signal Processing, Optimization, Copyright Law

Industry Experience

Normal Computing — **Jun 2023 - Dec 2023**

ML Resident — *New York City, USA*

- **Branches**: Built a framework to visualize advanced reasoning and planning algorithms like Tree Search with LLMs. Worked on *Tree-of-Thought + Reflexion* style planning algorithms for objective problem solving.
- **Verilog Code Gen**: Explored LLMs for Verilog Code Generation, using prompting, contrained generation, execution feedback and reinforcement learning to solve the VerilogEval dataset.

Meesho — **Nov 2021 - Aug 2022**

Data Scientist - II — *Bangalore, India*

- **Taxonomy Recognition**: Built the founding image engine powering Attribute Extraction, Similarity Learning, Brand Logo identification, Watermark and Fraud identification across multiple product categories. 80% pareto = 35 categories x 10m products per month (avg)
- Deployed and maintained the end-to-end CV-ML system with MLOps. Project Impact: 30% Reduction in cost = $20M per year

Myntra Designs — **Jul 2018 - Aug 2020**

Data Scientist — *Bangalore, India*

- **Regional Utilisation**: Modelled the optimal allocation of products to Myntra's principal warehouses considering the dynamic capacity of warehouses. Estimated the regional demand of products using product attributes as features and MLP model. [arxiv]
  Project Impact: 27% Improvement in RU; 20% Improvement in 2DD
- **GAN Experiments**: Experimented with text-to-image generation, and interpolations using Attentional GANs. Proposed different gradient aware loss functions for estimating noise vectors in GANs.

Publications

Intelligent Warehouse Allocator for Optimal Regional Utilization [arxiv]

Girish Sathyanarayana, ***Arun Patro*** — *AI for Fashion Supply Chain Workshop, KDD 2020*

Let AI Clothe You: Diversified Fashion Generation [link]

Rajdeep H. Banerjee, Anoop Rajagopal, Nilpa Jha, ***Arun Patro****, Aruna Rajan* — *Computer Vision - Workshops, ACCV 2018*

Evaluation of Loss Functions for Estimation of Latent Vectors from GAN [link]

Arun Patro*, Vishnu Makkapati, Jayanta Mukhopadhyay* — *IEEE Workshop MLSP - 2018*

Enhancing Symmetry in GAN Generated Fashion Images [link]

Vishnu Makkapati, ***Arun Patro*** — *BCS SGAI International Conference on AI-2017*

Blogs

Monte Carlo Tree Search for Code Generation using LLMs [link] [github]

Developing Advanced Reasoning and Planning Algorithms with LLMs [link] [github]

GPTX: Comparing multi-processing features of Rust and CPP using GPT-2 [link] [github]

Benchmaring rust-vs-cpp for graphics [link] [github]

Selected Projects

3D Digitization of Humans for Size and Fit Estimation — **Aug 2020**

Won BRONZE at annual Myntra Hackathon. Using two images of a person in tight fit clothes, we could estimate the size and fit of a person upto 1 inch accuracy. We used Open Pose and PIFuHD.

Automated Fashion Generation using GANs — **2017 - 2018**

Experimented with GANs to improve quality of fashion images with periodic signals (stripes, checks, etc). Worked on inverting GANs to obtain latent code to enable mixing-and-matching designs.

Skills

Languages: Python, C++, Rust, JS