

# ARUN PATRO

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## EDUCATION

### NYU Courant Institute of Mathematical Sciences

Masters in Computer Science

Sep 2022 – Present

- **Key Courses:** NLP, Programming Languages, Bayesian Machine Learning, Deep Reinforcement Learning, Graphics, Multi-core

### 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

### Ramp

Jun 2024 - Now

Software Engineer, Applied AI

New York City, USA

At Ramp, I have applied AI to both the product and internal tooling layer to save users and engineers time and money:

- **Product:** Agentic Document parsing and OCR with LLMs - Invoices, Receipts, Contracts, Balance Sheets and Cashflows. Expense Policy QA with RAG, Expense Report Grouping + Autocomplete, Tax Capture and Coding for Accounting, Speeding up Receipts OCR
- **Internal:** In house AI Code Reviewer scanning for mistakes, vulnerabilities and best practices. Automatic Code Gen Test Coverage, Gong Call Watch for Love/Hate used by CXOs for realtime customer sentiment visibility
- **Applied AI Infra:** Managing the centralized LLM proxy, structured outputs, OCR and embedding services at Ramp capturing 99% LLM calls. Managed braintrust for centralized LLM monitoring and evals. Scale of 100k+ calls per day.

### 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, constrained 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

- **Warehouse Optimization:** Solving the allocation of products to Myntra's principal warehouses, with dynamic capacities and regional demand. Used Mixed Integer Programming, and simple NNs for regression [arxiv]  
**Project Impact: 27% Improvement in RU; 20% Improvement in two day delivery**
- **GAN Experiments:** Text-to-image generation, mix-and-match interpolations, gradient based estimation of noise vectors in GANs.

## PUBLICATIONS

- Intelligent Warehouse Allocator for Optimal Regional Utilization [arXiv]
- Let AI Clothe You: Diversified Fashion Generation [Springer]
- Evaluation of Loss Functions for Latent Vector Estimation from GANs [IEEE]
- Enhancing Symmetry in GAN-Generated Fashion Images [Springer]

## 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]

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

## SELECTED PROJECTS

### lumos

<https://lumiralabs.github.io/lumos/>

OSS textbook parser with LLMs for sanitizing table of contents, extracting LLM digestible chunks, partitions of chapters

### lumeon

<https://lumeon.app>

AI Learning Studio for Textbooks with lesson, quiz and flashcard generations. CMD-K for search + CMD-L for cursor style chat

## SKILLS

Languages: Python, C++, Rust, JS, TS