RISHABH JAIN

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EDUCATION

Columbia University New York Aug 2025 - Dec 2026

Master of Science (MS) Computer Science (Machine Learning) | GPA: 3.92/4 *New York, NY*

- ML Decision Theory, High Performance ML and Inference, Natural Language Processing, Robot Manipulation

Indian Institute of Technology (IIT) Ropar Jul 2019 - May 2023

B.Tech (Honors) Computer Science and Engineering, Concentration in Artificial Intelligence *Ropar, IND*

- Algorithms, Databases, Operating Systems, Data Science, Neural Networks, Advanced Computer Vision

WORK EXPERIENCE

Software Engineer, Arista Networks Jul 2023 - Jun 2025

C, C++, Python, Linux, Git, Perforce *Bengaluru, India*

- Worked on low-level BESS & DPDK C++ modules in EOS software forwarding engine for optimizing throughput and memory efficiency. Led creation of stateful bi-directional flow modules in CloudVision IPFIX across ICMP, TCP, GRE stacks
- Contributed in building support for a 9× capacity increase in the EOS concurrent flow hash table. Re-wrote flow table scale test suite with multiprocessing in Python, achieving a 6× gain in evaluation throughput with 90 million flows
- Designed configuration CLIs and SysDB agents to add support for MSS firewall in EOS network switches
- Created internal RPM build tools to resolve upstream AlmaLinux dependency graphs with Arista patches during a company-wide shift from Perforce mono-repo to Git multi-repo. Streamlined development workflows for 15+ teams

Edison AI Intern, General Electric Healthcare Jun 2022 - Jul 2022

PyTorch, FastAPI, PostgreSQL, Docker, Computer Vision *Bengaluru, India*

- Developed a vision based system for real-time, face-indexed spatio-temporal tracking of admitted patients in hospitals
- Co-annotated an internal dataset, ablated YOLOv5 to develop a low-cost model, and fine-tuned it with just 5GB VRAM

PROJECTS AND RESEARCH

Accelerating Speculative Decoding for LLMs via On-Policy Knowledge Distillation Oct 2025 - Dec 2025

PyTorch, Huggingface TRL | GitHub: r-rishabh-j/batched_specdec, r-rishabh-j/distillSpec

- Implemented a speculative decoding engine with batching, non-uniform acceptance length and kv-cache pruning
- Distilled Qwen3-0.6B and SmolLM-360M drafters from Qwen3-4B and SmolLM-1.7B respectively via sequence level white-box On-Policy Knowledge Distillation to align models for accelerating speculative generation
- Benchmarked token and sequence level acceptance rates over FKL, RKL and JS divergence objectives, achieving 5% increase in token acceptance rate under 1 epoch of distillation on GSM8k and 4% on CNN-DM

NFR Benchmarking in IBM ITBench for IT Automation AI Agents Oct 2025 - present

CrewAI, Langfuse, vLLM | GitHub: ITBench-NFR *IBM Research, Columbia University*

- Co-developing a non-functional requirements (NFR) evaluation framework extending ITBench - defining a two-level taxonomy for agent-specific requirements and instrumenting SRE, CISO and Mini-SWE agents with Langfuse and vLLM
- Compared ReAct and Plan&Execute architectures on ITBench scenarios using Gemini-2.5-Pro and Qwen3-14B LLMs

Viewpoint-Invariant Robot Manipulation via 3D Geometric Priors Nov 2025 - Dec 2025

PyTorch, MuJoCo, Gymnasium, Robotics | GitHub: r-rishabh-j/3DEgoACT

- Enhanced ACT to fuse PointNet-encoded 3D point-cloud with egocentric 2D ResNet embeddings to mitigate inference-time view-point perturbations in low-cost imitation learning based policies
- Ablations established the necessity of combining egocentric visual cues with allocentric 3D representations
- Model achieved zero-shot generalization (∼70% success rate) to perturbed viewpoints where the baseline failed

Video Transformer Based Multi-view Body Language and Behaviour Recognition May 2023 - Oct 2023

PyTorch, Computer Vision | GitHub: MAGIC-TBR *Monash University, IIT Ropar*

- Built a multi-view feature-fusion VideoSwin transformer based pipeline for multi-label classification of body behavior
- Placed 2nd in the ACM MM 2023 Grand Challenge, published papers at ACM MM 2023 and IEEE TAFFC

TECHNICAL SKILLS

Languages: C, C++, Python, Java, RISC-V, Bash

Math & AI: NumPy, Pandas, CUDA, PyTorch, HuggingFace, MuJoCo

Backend: PostgreSQL, PostGIS, FastAPI, Google Cloud

Tools: Git, Linux, Docker, vLLM, Langfuse, OpenAI SDK