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Summary

Machine Learning leader with 9+ years of industry experience (3+ years in leadership), spanning FinTech, Autonomous Checkout, AVs, and Digital Health. Proven ability to build and scale ML products using LLMs, Computer Vision, Deep Learning, and Edge AI. Passionate about driving high-impact solutions from research to deployment.

- Driving Agentic AI at PayPal using LLMs and Reinforcement Learning to power multi-turn agents for long-horizon decision-making.
- Scaled Standard AI's autonomous checkout platform to 40+ stores, saving $4M+ YoY and delivering a robust Edge AI system.
- Designed the early Edge compute platform at NIO, a foundation for the Adam supercomputer, now deployed in 100K+ L4 autonomous vehicles.

Experience

Staff Machine Learning Engineer, PayPal, San Jose, CA **Jul '23 - Present**

- Leading a strategic R&D effort in Agentic Commerce at PayPal, leveraging LLMs and Reinforcement Learning to enable multi-turn conversational agents to drive long-horizon decision making.
- Boosted developer productivity by 30% through R&D and deployment of LLM-based tools across the SWE and ML lifecycle—informing build-vs-buy decisions and driving internal platform strategy.
- Built and scaled the lifecycle for open-source Coding LLMs, including dataset curation, finetuning, Retrieval-Augmented Generation (RAG), and custom evaluation—enabling rapid prototyping of developer-facing ML tools.

Engineering Manager, Machine Learning, Standard AI, San Francisco, CA **Nov '19 - May '23**

- Scaled and productionized Autonmous checkout solution from 2 to 40+ stores with 5x more environment complexity and foot traffic with 3 different hardware platforms leveraging various ML models including Human Pose estimation
- Led end-to-end design of next-gen hardware platform delivering Perception on Edge within a 6-month roadmap, projecting $1M+ annual margin improvement per store.
- Established new product verticals in Human Trajectory-based Retail Analytics and Visual Feature-based Re-Identification, boosting profit margins and user retention.
- Designed and implemented an automatic labeling system for identifying tail distribution for Perception models, leading to a 10x increase in software deployments and cutting development costs by 85% ($1M YoY in savings)
- Architected, and designed systems for automated training, deployment, and management of machine learning models, resulting in over 90% operational cost reduction ($1M YoY in savings) and 25% improvement in model accuracy
- Spearheaded the design of Vertex AI based based ML inference serving platform from scratch, serving 5 internal ML teams for deploying all ML and DNN algorithms
- Managed, mentored, and led a global team of 7 ML engineers, researchers, and interns, successfully delivering multiple high-impact projects under tight deadlines in cross-functional settings.
- Championed team culture, overseeing hiring, onboarding, and career growth initiatives for engineers and interns.
- Defined team strategy, roadmap, success metrics, and priorities; translated them into actionable engineering goals aligned with company objectives.

Perception Engineer, NIO, San Jose, CA **March '18 - Nov '19**

- Led the design of the Edge compute platform at NIO, which served as the precursor to the Adam supercomputer—powering over 100,000 L4 autonomous vehicles.
- Optimized DNN algorithms to accelerate ML model inference up to 5x on edge platforms for the L4 autonomous vehicle program, maintaining accuracy within 1% loss.
- Designed and refined lidar-based scene understanding DNNs, including a two-stage object detection model leveraging multimodal inputs (BEV images and 3D voxels), achieving compressed and accelerated performance.
- Led development of a low-level inference library supporting custom operations for running deep learning models on diverse hardware accelerators at the edge.
- Mentored senior engineers and interns in developing software to deploy multiple DNN models concurrently on embedded target platforms

Machine Learning Engineer, Otsuka Digital Health, Princeton, NJ **July '17 - March '18**

- Improved short-term medical claims cost prediction accuracy by 90% using LSTM-based deep learning models, enabling better patient prioritization for care.

- Designed and implemented advanced deep learning and ML algorithms for predictive modeling, along with novel methods to describe and visualize medical claims data.

Graduate Research Assistant, Rutgers University, New Brunswick, NJ **July '16- June '17**

- Developed a novel algorithm for face clustering based on multiple facial attributes
- Developed and published a novel face recognition algorithm for aggregating visual features based on clustering in a multi-shot video-to-gallery template retrieval problem in an unconstrained environment
- Investigated the role of face data and attribute bias in automated photo-sketch generation

Visiting Researcher, Indian Institute of Technology, Delhi, India **Dec '11 - July '15**

- Developed and published a robust speaker verification algorithm invariant to noise and multi-channel input using GFCC, MFCC and i-vectors.
- Developed and published novel decision tree based method for error analysis for eye movement tracking for biometrics.
- Independently led data collection, curation, labeling and management of human irises datasets from 50+ users in a period of one month.

Publications

Atul Dhingra, G Sood, " Instate: Predicting the State of Residence From Last Name ", arXiv:2303.06823

Atul Dhingra, G Sood, " Scaling ML Products At Startups: A Practitioner's Guide", arXiv:2304.10660

Atul Dhingra, G Sood, " Instate Corpus", Harvard Dataverse, doi.org/10.7910/DVN/ZXMVTJ

Atul Dhingra, G Sood, "Indian Electoral Roll Corpus", Harvard Dataverse, doi.org/10.7910/DVN/OG47IV

Atul Dhingra, M. Jeevan, M. Hanmandlu, B.K Panigrahi , "Robust Speaker Verification using GFCC based i-vectors", in Proceedings of the IEEE International Conference on Signal, Networks, Computing, and Systems 2016 (Springer)

Atul Dhingra, K Vishal, "Wielding Audio-Books for Visually Impaired Using Gesture Recognition", International Journal Of Advanced Research Trends In Engineering And Technology; 2(5), pp. 64-68, 2015

Atul Dhingra, A Kumar, M. Hanmandlu, B.K Panigrahi , "Biometric Based Personal Authentication Using Eye Movement Tracking", SEMCCO 2013, Part II, LNCS(Springer) 8298, pp. 248-256, 2013

Patents

Atul Dhingra, et al, "One or more cameras for use in an autonomous checkout in a cashier-less shopping store and otherwise"", US Application No. 18/539,228, December 13, 2023

Atul Dhingra, et al, "Subject-tracking in a cashier-less shopping store for autonomous checkout for improving item and shelf placement and for performing spatial analytics using spatial data and the subject-tracking", U.S. Application No. 18/522,104, November 28, 2023

Atul Dhingra, et al, "Systems and methods for performing spatial analytics using spatial data related to a cashier-less shopping store for autonomous checkout", U.S. Application No.: 63/428,373, November 28, 2022

Atul Dhingra, et al, "Machine learning-based re-identification of shoppers in a cashier-less store for autonomous checkout ",U.S. Application No. 17/988,650, November 16, 2022

Skills

Programming Languages: Python

Tools/ APIs: Langchain, Hugging Face, Milvus, Pytorch, Tensorflow, TensorRT, Vertex AI, MLOps, NLP, Edge Computing, Numpy, Git, Keras, OpenCV, Dlib, Pandas, Selenium, VLFeat, Unity3D, Data Analysis, Linux

Edge Hardware: Nvidia Drive AGX, Nvidia Jetson, Intel Accelerators, Others (Under NDA)

Softwares: Scrum, Kanban, Jira, Smartsheets, github, dvc, GCP, databricks, looker, Pager Duty

Education

M.S in Computer Science, Rutgers University, NJ, USA

Visiting Researcher at Biometrics Research Lab, Indian Institute of Technology, Delhi, India

B.E in Instrumentation & Control Engineering, University of Delhi, India