Bhareth Kachroo

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About

Engineer with 6+ years building AI systems for large-scale imagery data from data-engineering to product integration in biomedical, remote sensing, and climate.

Work

2024 — **Independent Consultant**, *Proteowise: Automated High-Throughput Proteomics Devices*.
- Built an ML labelling-training-evaluation pipeline with 4X error improvement for computer-vision classification of Western Blot bands for automated protein detection;

2023-2024 — **Chief Technology Officer**, *streambatch: High-Res Fused Satellite Data for Agriculture*.
- Designed a cloud-based data-engineering system for near-realtime extraction of time series data from PB-scale satellite imagery from multiple constellations, accessible via API, with 100X cost-savings;
- Created a 500-TB data archive for MODIS satellite imagery data with an optimized data layout for timeseries extraction via cloud storage protocols;
- Developed an ML data-fusion algorithm for multi-resolution pooling of observations from multiple constellations to produce a global, 10m NDVI data product with 3X denser coverage;
- Pitched and worked with enterprise customers to provide application-specific integrations;

2020-2021 — **Independent Consultant**, *Codetta/UNC: Multiplexed Biomarker Measurement Devices*.
- Designed an end-to-end computer vision pipeline for automatic quantification of nano-array PCR.
- Developed a novel well-array registration algorithm robust to 20-degree deviations, fast non-GPU detection, and noise-averaging PCR fitting.

2018-2023 — **Chief Technology Officer**, *Pharos Platforms: Big Geodata & ML for Climate Risk*.
- Hired and managed a team of 6+ engineers and interns;
- Pitched investors and customers, raised pre-seed funding and secured enterprise contracts;
- Delivered realtime flood forecasting tool using ML sensor fusion of river-gauge and weather data;
- Produced multi-year waterflow forecasts for 200 U.S. hydropower stations using ML models to fuse local weather and global climate modelling data;
- Created a generative ML model of dynamical climate simulation archives for high-res disaster risk;
- Built a data-engineering service for real-time API access to TBs of high-res weather/climate geodata;

2018-2019 — **Optical Engineer/Computer Vision Engineer**, *Chipcare: Multimodal POC Diagnostic Devices*.
- Developed novel designs for laser illumination in fluorescent microscopy and ultra-fast video-imaging systems on biomedical diagnostic devices;
- Increased illumination power efficiency 10X, decreased non-uniformity 2X, decreased speckle noise 5X;
- Developed a near-realtime CV pipeline for 30GB/run microscopic flow data on a point-of-care device;
- Detected and tracking flow beads using convolutional ML and graph-matching;
- Classified diagnostic targets (8 classes, 97% acc.) through trained statistical models;

Education

2014–2018 — **B.AS. in Engineering Science (Physics)**, *University of Toronto*, Toronto.
A rigorous engineering program with a focus on first-principles.
- **David C. Naylor Scholarship**

Skills

Software	*Data Engineering, Applied Machine Learning, Computer Vision, Solution Architecture, API Design, Cloud Computing (AWS, GCP), Python*
Applications	*Biomedical Devices, Satellite Imagery, Weather/Climate Geodata*
Business	*Technical Sales, Engineering Management, Enterprise Solutions, Customer Discovery*