Alishba Imran

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EDUCATION_____

University of California, Berkeley *Berkeley, CA.* BA. in Computer Science & Applied Math

EXPERIENCE_____

Member of Technical Staff - EvolutionaryScale (now BioHub)   August 2025-present
- Co-leading key components of flagship effort building the largest virtual cell models integrating genomic, protein, and functional data.
- Leading post-training strategies and designing biologically grounded evaluation frameworks to assess model generalization and functional relevance.

Research Fellow - Arc Institute with Yusuf Roohani, ML Group Lead   December 2024-July 2025
- Built State [link], one of the first models capable of predicting behaviour of biological cells, trained on the largest single-cell perturbation dataset to date: 170M observational and 100M+ perturbational cells across 70 cell lines.
- Designed a multi-scale transformer architecture combining cell embeddings with state-transition modeling to generalize perturbation effects to unseen cellular contexts, outperforming prior methods by >50%.
- Delivered 2× improvement in identifying differentially expressed genes across genetic, chemical, and signaling perturbations, enabling virtual cell modeling for drug target discovery (advised by Yusuf H. Roohani).

Research Intern - Chan Zuckerberg BioHub   May 2024-August 2024
- Created dynaCLR, utilizing time-aware contrastive sampling to embed images in a unified way and applied dynaCLR to analyze viral infection kinetics in human cells, detect transient changes in cell morphology due to cell division, and map organelle dynamics during viral infection.
- Achieved > 95% classification accuracy with models trained using dynaCLR, facilitated detection of transient cell state changes, and provided embeddings for unseen experiments. Performed comparative analysis of cell states under perturbations such as infections, gene knockouts, and drugs. Published in NeurIPS 2025, pre-print [link].

Deep Learning Research with Pieter Abbeel, Berkeley AI Research Lab   August 2023-current
- Built text-conditioned protein language models and sequence–structure architectures (CLIP-style), incorporating interpretability-guided protein generation. Advised by Prof. Pieter Abbeel and Dr. Amy Lu.
- Developed cross-resolution feature learning methods to improve robustness of biological and robotic perception systems against adversarial perturbations. Advised by Prof. Pieter Abbeel and Dr. Carlo Sferrazza.
- Collaborated with Google and AUTOLab on integrating language semantics into search and object manipulation, combining LLM-based semantic planning with spatial uncertainty modeling; explored language-driven scene generation (paper).

Machine Learning - Cell Materials Engineering at Tesla (Dr. Matthew Murbach)   May 2023-August 2023
- Developed an open-source implementation using an attention-based-CNN-BiLSTM for accurate estimation of lithium-ion batteries state of health (SOH) and remaining useful life (RUL). [Link]
- Using density functional theory (DFT) such as GGA functionals, I studied the thermodynamic properties, reaction kinetics, and ion transport paths of electrodes/electrolytes.
- Developed time-series ML models using dQ/dV features and precharge metrics, coupled with active learning, to predict energy performance and validate cell chemistry.

Machine Learning Engineer at Cruise   April 2022-Aug 2022
-Implemented perception ML stack for 3D object detection and segmentation using language models for a fleet of over 70 AVs around San Francisco.
-Worked on trajectory prediction of actors using sequence models like transformers, RNNs and GNN/GCNNs.
-Managed the product direction for a team of 4 engineers and developed new features on the Pick Up Drop Off (PUDO) product with engineers to build/test these new features.

Co-founder and CTO of Voltx   May 2020-Dec 2021

-I co-founded Voltx, a software platform that utilized ML sequence models (transformers, LSTMs, RNNs) and physics models (ordinary differential equations) to accelerate battery testing and materials discovery for electrochemical devices (batteries/supercapacitors).

-We piloted our work with two of the largest supercap. manufacturers, Maxwell Tech (sub. of Tesla) and Skeleton Tech. Our models were able to reduce testing time by 70%+, from 3 months to 3 days, within QA/QC production. Through our pilots, we secured $60K in booked revenue.

-We raised a $1.3 million seed round backed by Human Capital, Village Global (backed by Bill Gates, Jeff Bezos, etc), and AIX Ventures (founded by Pieter Abeel).

Machine Learning Lead / Robotics Engineer, Hanson Robotics   June 2020-June 2021

- Led machine learning development for robotic manipulation on Sophia the Robot, using generative grasping convolutional neural network (GG-CNN) with 95% accuracy in grasp pose detection, collaborating with Dr. David Hanson and senior engineers. Experimented with reinforcement learning and other computer vision techniques for object detection/tracking using ROS and Pybullet to improve hand manipulation for high-precision use cases.

- Published two lead author research papers and one poster as lead co-author on Sophia 2020 platform including software and mechanics for AAAI-21 ([Neuro-Symbolic AI Controller](#)), [Open Arms Platform](#) and [AAAS Annual Meeting 2021](#).

Project Lead: Machine Learning Researcher at SJSU/BLINC Lab [[Project Slides](#)]   August 2019-June 2020

- Led a team of 4 across SJSU and the BLINC Lab, where we developed a 3D printed material and design to reduce the costs of prosthetics from $10,000 to $700. My work primarily focused on developing computer vision approaches that outperform current CNNs with 90% accuracy for robot path planning and grasp pose detection, working with a masters student and Dr. Fred Barez (Professor and Chair of Mechanical Engineering at San Jose State University) [[demo](#)]

- Published pre-print research paper for publication as the lead co-author in IMECE 2021 at [arXiv](#) and presented a poster at WiML [NeurIPS 2020](#).

RESEARCH & PUBLICATIONS

Predicting cellular responses to perturbation across diverse contexts with State [[PDF](#)]. Abhinav K. Adduri*, Dhruv Gautam*, Beatrice Bevilacqua*, **Alishba Imran***, et al. Getting published in Cell Systems. Posters in NeurIPS 2nd Workshop on Multi-modal Foundation Models and Large Language Models for Life Sciences and AI Virtual Cells and Instruments: A New Era in Drug Discovery and Development.

Embedding cell state dynamics via contrastive learning of representations of 3D dynamic imaging datasets [[PDF](#)]. Eduardo Hirata-Miyasaki*, Soorya Pradeep*, Ziwen Liu*, **Alishba Imran***, Taylla Milena Theodoro, Ivan E Ivanov, Sudip Khadka, See-Chi Lee, Michelle E Grunberg, Hunter Woosley, Madhura Bhave, Carolina Arias, Shalin B Mehta. Published in NeurIPS 2025 Workshop for Imageomics: Discovering Biological Knowledge from Images Using AI.

DynaCLR: Contrastive Learning of Cellular Dynamics with Temporal Regularization [[PDF](#)]. Eduardo Hirata-Miyasaki*, Soorya Pradeep*, Ziwen Liu*, **Alishba Imran***, Taylla Milena Theodoro, Ivan E. Ivanov, Sudip Khadka, See-Chi Lee, Michelle Grunberg, Hunter Woosley, Madhura Bhave, Carolina Arias, Shalin B. Mehta. Pre-print.

Contrastive learning of cell state dynamics in response to perturbations [[PDF](#)]. Soorya Pradeep*, **Alishba Imran***, Ziwen Liu*, Taylla Milena Theodoro, Eduardo Hirata-Miyasaki, Ivan Ivanov, Madhura Bhave, Sudip Khadka, Hunter Woosley, Carolina Arias, Shalin B Mehta. Pre-print.

From Occlusion to Insight: Object Search in Semantic Shelves using Large Language Models [[PDF](#)]. Satvik Sharma, Kaushik Shivakumar, Huang Huang, Ryan Hoque, **Alishba Imran**, Brian Ichter, Ken Goldberg. Pre-print.

Design of an Affordable Prosthetic Arm Equipped with Deep Learning Vision-Based Manipulation [[PDF](#)]. **Alishba Imran**, William Escobar, Freidoon Barez. Published in ASME's International Mechanical Engineering Congress & Exposition (IMECE) 2021.

Open Arms: Open-Source Arms, Hands & Control [[PDF](#)]. David Hanson, **Alishba Imran**, Gerardo Morales, Vytas Krisciunas, Aditya Sagi, Aman Malali, Rushali Mohbe, Raviteja Upadrashta. Pre-print. Published in ICCAS 2022, IEEE Robotics and Automation Letters.

A Neuro-Symbolic Humanlike Arm Controller for Sophia the Robot [[PDF](#)]. David Hanson, **Alishba Imran**, Abhinandan Vellanki, Sanjeew Kanagaraj. Published in AAAI 2021.

Human Emulation Robotics & AI Framework: Recent Experimental Results [[Link](#)]. AAAS 2021 Annual Meeting poster.

Towards Better Prosthetic Arms with Intelligent Robotics [[Link](#)]. WiML NeurIPS 2021 poster.

PROJECTS_____

-Co-author of Book 'AI for Robotics': Published in Springer Nature
Published the book "AI for Robotics" with Springer Nature, alongside co-authors Keerthana Gopalakrishnan (leads Humanoid research Google DeepMind).

-Multi-Modal Approach for Learning Peg-in-Hole Tasks in PyBullet [project demo]
Used self-supervision to learn a compact and multimodal representation of sensory inputs, which can then be used to improve the sample efficiency of our policy learning. We train a policy in PyBullet (on the Kuka LBR iiwa robot arm) using PPO for peg-in-hole tasks. This implementation can also be used to understand force-torque (F/T) control for contact-rich manipulation tasks as at each step the force-torque (F/T) reading is captured at the joint connected with the end-effector.

-**Reinforcement Learning Pick & Place Robotic Arm** [project demo]
Using OpenAI's Robotics environment Fetch, I trained a robot to lift, slide, move objects to defined targets using Deep Deterministic Policy Gradients (DDPG) and Hindsight Experience Replay (HER).

-**Vision-Based Robotic Grasping - Pybullet** [project demo]
Using the Kuka Diverse Object Grasping Environment for Vision-Based Robotic Grasping using RL methods such as DDPG. This implementation was widely inspired by this paper: https://arxiv.org/pdf/1802.10264.pdf and the Kuka Diverse Object Grasping Environment on Pybullet.

-Vision-Based Manipulation for Prosthetics [project demo]
Implemented generative grasping convolutional neural network (GG-CNN) and GVFs that was trained and tested on the Cornell Grasping Dataset for improving manipulation on prosthetics.

-**RNN for Predicting Lifetime of Supercapacitors/Batteries** [project demo]
Implemented RNN models such as LSTMs and other autoregressive time-series methods for predicting capacitance and resistance in supercapacitors to reduce testing time for batteries in labs from 4000 hrs to 1000 hrs.

SKILLS_____

Languages: C, Java, Python, CSS, HTML, JS
Technologies: Kubernetes, TPUs, GPUs: CUDA, OpenCL, HPC: MPI, OpenMP, Databases: SQL, Design: AutoCAD, Fusion 360, experience working with robotic simulation environments such as Pybullet, ROS, Gazebo, Unity. Machine Learning frameworks: OpenCV, Keras, TensorFlow, PyTorch, Pandas, Jax.
Hardware: Arduino, Raspberry Pi, 3D Printing, sensors, servo motors and programming embedded systems.
Communication: Presented about machine learning, robotics and blockchain at companies and leading conferences including KPMG, Google, TedxUW, CES to over 40,000 executives and researchers.

Example talks: The Inevitable Future of Machine Intelligence (TEDxUW), Reward Functions in Reinforcement Learning (CAMDEA Digital Forum), Computationally Efficient Learning Methods for Control, and Perception (AI Superstream Series: Scaling AI - O'Reilly Live Events), Machine Learning and Robotics (ODSC Webinar).

AWARDS AND FUNDING _____

Teen Vogue 21 Under 21 [Link] - I was named Teen Vogue's 21 under 21.
Canada's Top 100 Most Powerful Women [Link] - National award that I was selected for, alongside 100 other women in Canada, by executives and leaders at companies like WXN, RBC and KPMG.
Inno Under 25 - SF Business Times [Link] - Named one of Inno's Top 20 Under 25 selected by SF Business Times.
Masason Foundation (Softbank) Member - Masason Foundation was started by Masayoshi Son who is the Founder, CEO of SoftBank Group Corp. Each year they select 30 youth (2% acceptance rate) from around the world, with high aspirations and exceptional talents to provide them with an environment and support to contribute to the future of humankind.
Consumer Electronics Show (CES) Young Innovator to Watch [Link] - YIW is a prestigious award (0.5% acceptance rate) at CES, a leading technology conference in the world. I was selected as one of the 5 to win this award in 2020 where I got $1K in funding, and a fully expensed trip to speak at CES (1K+ attendees) in Las Vegas.
Human Capital Delta Fellowship: $50K grant [Link] - The Delta Fellowship gives ambitious students the capital, mentorship, and resources they need to create mission-driven companies. I was selected as one of the 16 out of 1000+ applicants who got a $50K grant, and mentorship to grow my startup Voltx.