Stanley Z. Hua

Toronto, Canada
(+1) 4379863444 | stanley.z.hua@gmail.com | linkedin | github | website

Education

University of California, Berkeley — Berkeley, USA
PhD Computational Precision Health — *Aug. 2025 – Present*

University of California, San Francisco — San Francisco, USA
PhD Computational Precision Health — *Aug. 2025 – Present*

University of Toronto — Toronto, CA
Honours BS Computer Science Specialist (GPA: 3.84/4) — *Sept. 2022 – June 2024*

University of Toronto — Toronto, CA
Honours BS Bioinformatics & Computational Biology Specialist — *Sept. 2019 – Sept. 2022* (Switched Majors)

Technical Skills

Languages: Python, SQL, Shell Script, Git, Javascript, HTML/CSS, C/C++, Java, R, Assembly
Software Tools: Airflow, AWS, Docker, GitHub, Redis, Figma
Data Skills: Data Engineering, Data Visualization, Machine Learning, Computer Vision, NLP
Python Libraries: Pandas, NumPy, Matplotlib, Dask, Ray, psycopg2
ML Libraries: PyTorch (PyTorch Lightning), Tensorflow, Scikit-Learn, Comet
CV/NLP Libraries: Transformers, vLLM, Langchain, Guardrails, nltk, OpenCV

ML Research Experience

Data Scientist — June 2024 – Present
The Hospital for Sick Children (Supervisor: Prof. Lauren Erdman) — *Toronto, CA*

- (With Lauren Erdman & Mandy Rickard) Develop RenalView – a real-time model to guide the acquisition of pediatric renal ultrasound views and improve community point-of-care ultrasound. Validated retrospectively on data from SickKids, Stanford, CHOP and UIowa.
- (With Lauren Erdman) Aggregate and clean public ultrasound data to develop an OOD (or selective classification) benchmark for real-time ultrasound.
- (With Lauren Erdman & Alex Lu) Performed a large-scale review of public medical imaging datasets, demonstrating that less than 1% of public data is pediatric. We further show that young children are at risk if using adult X-ray models.
- (With Lauren Erdman & Michael Chua) Fine-tuned a SAM2-UNet model to segment penises with hypospadias to assist in surgical planning.
- (With Lauren Erdman, Tim Van Mieghem & Catherine Windrim) Developing a segment-reconstruct-segment algorithm for detecting abnormalities – anencephaly – in first trimester fetal ultrasounds.
- Spearheaded the design and approval of 2 REB/IRBs for a prospective silent trial for RenalView, and for a retrospective study on LLMs for referral note prioritization
- Organized workshops for the broader SickKids Research Institute on: a) deep learning for medical image analysis, b) accelerating scientific computation with GPUs on the SickKids HPC SLURM cluster and c) a two-part SQL tutorial on the Expedition cloud platform.

ML Research Assistant — May 2024 – Aug. 2025
University of California, Berkeley — *Remote*

- (With Irene Chen & Sanae Lotfi) Investigated the impact of quantization on social bias in LLMs, finding that model-bias specific uncertainty is a key contributor of behavioral changes.

ML Research Assistant — Jan. 2024 – June 2024
Vector Institute (Supervisor: Prof. Rahul Krishnan) — *Toronto, CA*

- Benchmarked multi-agent prompting methods to improve zero-shot performance of open-source large multi-modal models (Mixtral 8x7B, LLaVA) for general and healthcare-specific MCQA datasets.
- (With Ian Shi and Philip Fradkin) Assisted in evaluation of mRNA foundation model IsoCLR against RNA foundation models (mRNA-FM and CodonBERT) to perform RNA-binding protein prediction

Junior ML Specialist May 2022 – Aug. 2023

The Hospital for Sick Children (Supervisors: Prof. Lauren Erdman, Alex Lu, Prof. Irene Chen) *Toronto, CA*

- Demonstrated that (MoCo) **supervised contrastive image pre-training** can improve **in-domain** and **out-of-distribution generalization** for automatic view labeling on renal **ultrasound videos**.
- Trained and deployed CNN to forecast ER patient volumes, and explored Bayesian methods (GP, Bayesian NNs) for confidence interval estimation.

ML Research Assistant Sept. 2021 – May 2022

The Hospital for Sick Children (Supervisors: Prof. Lauren Erdman, Prof. Anna Goldenberg) *Toronto, CA*

- Adapted video-based deep learning methods for **feature aggregation** (Conv.Pooling, CNN-LSTM, TSM) to predict if a child needs kidney surgery from ultrasound images taken over multiple hospital visits.
- Demonstrated that ultrasounds from the first hospital visit alone is enough to predict the need for surgery.

ML Research Assistant May 2021 – Sept. 2021

University of Toronto (Supervisors: Prof. Alan Moses, Alex Lu) *Toronto, CA*

- Created the **CytoImageNet dataset** (890K images, 894 classes) from 20 TB of open-source microscopy images.
- Showed that CytoImageNet-pretrained models are competitive with ImageNet-pretrained models on downstream microscopy datasets, despite weak labels and minimal hyperparameter tuning (compared to ImageNet).
- The CytoImageNet dataset attracted attention on Kaggle (10696 views, 526 downloads).

ML Research Assistant Jul. 2020 – Jul. 2021

University of Toronto (Supervisor: Prof. Pascal Tyrrell) *Toronto, CA*

- Showed that choice of dimensionality following dim. reduction (PCA, autoencoder) is important for clustering (K-Means, DBSCAN, Agglomerative) of medical images under small sample sizes using Tensorflow.
- Performed registration and skull-stripping on brain MRIs of children with vasculitis using FSL

Engineering Experience

Co-Founder & Engineer July 2024 – Oct 2024

Joust *Toronto, CA*

- Led a team of 3 engineers and 2 marketing analysts to develop Joust, the last dating app for serious daters
- Under the Supabase Expo React Native app framework, co-designed the Postgres database schema, user authentication, match-making system and other guardrails to promote genuine interactions

Data Science Intern June 2023 – Sept. 2023

Wealthsimple *Toronto, CA*

- Collaborated with client-facing teams to create a **LLM framework** to perform zero-shot **topic/subtopic classification** of **customer service tickets** for ticket routing, resulting in 15% less errors versus humans.
- Designed, implemented and deployed model to an API endpoint that detects if a user entered invalid account details when initiating an account transfer, preventing a projected $12M in failed transfers annually.

Software Engineer Intern May 2022 – May 2023

Intel Corporation *Toronto, CA*

- Refactored a mission-critical **data extraction tool** to extract FPGA benchmarking results from a SQL database or file system, resulting in improved efficiency, code maintainability and unit-test coverage (99%).
- Optimized **SQL** and Pandas code for existing dashboards, speeding up loading time by 400%.
- Developed dashboards and automated checks, to ensure CRON jobs are spaced apart and benchmarking jobs are not abusing high-priority job queues, increasing stability of jobs and saving cloud compute by +1K hours per month

Publications

Hua SBZ*, Khondker A*, ..., Rickard M, Erdman L. Longitudinal image-based prediction of surgical intervention in infants with hydronephrosis using deep learning: Is a single ultrasound enough? PLOS Digital Health. August 2025.

Erdman L, Rickard M, Drysdale E, Skreta M, **Hua SBZ**, ... , Lorenzo AJ, Goldenberg A. The Hydronephrosis Severity Index guides paediatric antenatal hydronephrosis management based on artificial intelligence applied to ultrasound images alone. Scientific Reports. October 2024

Hua SBZ, Lu AX, Moses AM. CytoImageNet: A large-scale pretraining dataset for bioimage transfer learning. NeurIPS Workshop on Learning Meaningful Representations for Life. December 2021.

Hua SBZ, Rickard M, Weaver J, Xiang A, Alvarez D, Velear KN, Sheth K, Tasian GE, Lorenzo AJ, Goldenberg A, Erdman L. From Single-Visit to Multi-Visit Image-Based Models: Single-Visit Models are Enough to Predict Obstructive Hydronephrosis. 18th Symposium on Medical Information Processing and Analysis (SIPAIM). November2022.

Conference Posters

Machine Learning-Enabled Renal Ultrasound View Labeling to Expand Use of Point-Of-Care Imaging in Community Settings
Nature Conference on Precision Child Health 2024 (Toronto, Canada)

Supervised Contrastive Learning for Improved View Labeling in Pediatric Renal Ultrasound Videos
ISBI 2023 (Cartagena, Colombia)

***Longitudinal Image-Based Prediction of Surgical Intervention in Hydronephrosis Patients: Perhaps Earlier Decision-Making Is Possible!**
ESPU 2023 (Lisbon, Portugal)
*Not presenter

Invited Talks

Towards Meaningful Pretraining Data (with Alex Lu and Alexander Lin)
Models, Inference & Algorithms Seminar, Broad Institute
Boston, USA, October 25th, 2023

Pre-Print

Hua SBZ, He P, Towbin A, Heller N, Chen I, Lu A, Erdman L. Lack of children in public medical imaging data points to growing age bias in biomedical AI. *medRxiv*.

Honors & Awards

2024 **St. Michael's College In-Course Scholarship**, $3000

2024 **Hosinec Family Scholarship**, $3000

2023 **Samuel Beatty Fund Travel Grant**, $600

2021 **University of Toronto CSB Undergraduate Research Award**, $4000

2020-24 **Dean's List Award**

2021 **The F. M. Hill Scholarship in Biology**, $1100

Extracurricular Activities

Teaching Assistant June 2021 – Aug. 2021
University of Toronto – Independent Summer Statistics Community *Toronto, CA*
- Organized data science - related workshops for undergraduate statistics students.
- Presented hands-on workshop introducing the Pandas library.

Club President & Founder Sept. 2021 – Sept. 2022
University of Toronto – Offline *Toronto, CA*
- Led a team to build an online community of 200+ undergraduate students on Discord during the pandemic.
- Hosted multiple game nights and movie nights.

Events Coordinator May 2020 – May 2021
University of Toronto – Table Tennis Club *Toronto, CA*
- Led new initiatives to increase social media presence and spread information on table tennis players and competitions.

General Council Member Sept. 2020 – May 2021
University of Toronto – Bioinformatics & Computational Biology Student Union *Toronto, CA*
- Assisted in planning of online social activities for bioinformatics undergraduate students.

Volunteer Chess Teacher Aug. 2020 – Aug. 2020
Kensington Health – Second Mile Club *Toronto, CA*
- Organized, promoted and hosted beginner chess workshops for seniors.

Volunteer Photographer Feb. 2020 – Feb. 2020
West Neighborhood House *Toronto, CA*
- Took photographs and videos to help promote the not-for-profit's community services.