ALLISON (TSZ KWAN) LAU

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EDUCATION

ETH Zürich Sep 25' – Aug 27' (Exp.)
M.S. in Computer Science *Zürich, Switzerland*
Focus on Mathematical Foundations of Machine Learning

University of Toronto Sep 21' – Jun 25' (Exp.)
B.S. in Computer Science (*Specialist*), Physics (*Major*), Mathematics (*Minor*) *Toronto, Canada*

Coursework: Probabilistic Learning and Reasoning, Numerical Methods, Algorithm Design and Analysis, Neural Networks and Deep Learning, Probability with Computer Applications, Operating Systems

PUBLICATIONS

1. **A. Lau**, Y. Choi*, V. Balazadeh*, K. Chidambaram*, V. Syrgkanis, R. Krishnan. "Personalized Adaptation via In-Context Preference Learning". NeurIPS Workshop on Adaptive Foundation Models, 2024.
2. W. Guo, **A. Lau**, J. C. Davies, V. Forte, E. Grinspun, L. A. Kahrs. "Analyzing the effect of undermining on suture forces during simulated skin flap surgeries with a three-dimensional finite element method". EG VCBM, 2024.
3. A. Khandelwal, S. Jeram, R. Dungee, A. Lau, **A. Lau**, E. Sun, P. Van-Lane, S. Chen, A. Tohuvavohu, T. Li. "Beyond CCDs: Characterization of sCMOS detectors for optical astronomy". SPIE Astronomical Telescopes + Instrumentation, 2024.

RESEARCH EXPERIENCE

Research Intern, University of Toronto May 23' – Aug 25'

Vector Institute for Artificial Intelligence May 24' –
Supervisor: Rahul Krishnan
* Research in in-context learning for causal effect estimation with unobserved confounding [1]
* Implemented meta in-context learning algorithm for Large Language Model (LLM) post-training
* Conducted literature review on Reinforcement Learning from Human Feedback (RLHF), preference optimizations algorithms and memory mechanisms

Secure Intelligent and Trustworthy Systems Lab May 25' – Aug 25'
Supervisor: Gururaj Saileshwar
* Research in side-channel attacks on Mixture of Experts (MoE) LLMs (Mixtral 8x7B) – Work in Progress

Toronto Computational Imaging Group Sep 24' – Dec 24'
Supervisor: David Lindell
* Research in applications of polarization data retrieved from a coherent LiDAR prototype system
* Processed and analyzed polarization data, identifying key features and evaluating their potential applications for future research and system improvements.

Medical Computer Vision and Robotics Lab Jan 24' – May 24'
Supervisor: Lueder Kahrs
* Research in rhomboid surgical skin flap closure dynamics via physics-based animation for determining optimal undermining area [2]
* Developed skin simulation models based on finite element method (FEM) and explored various hyper-elastic models

Dunlap Institute May 23' – Aug 23'
Supervisor: Ting Li

* Designed and organized experimental setups for testing CMOS detectors, including calibration procedures and ensuring optimal conditions
* Conducted comprehensive data analysis of critical detector characteristics such as linearity, dark current and salt and pepper noise for space imaging [3]

Research Intern, Stanford University Jan 24' – Jan 25'
Supervisor: Michael Snyder

- Extended with 5 additional wearable devices and improved code efficiency for python package `Wearipedia`, specialized in data science, for extracting data in wearables, streamlined data extraction processes, generated synthetic data to support clinical research [code]
- Developed Wearipedia usage tutorial notebooks [code]
- Forged partnership with potential collaborator brands and data banks on data access and integration

Senior Aerodynamics R&D Engineer, UofT Blue Sky Solar Racing May 23' – May 25'
Faculty consultant: Amy Bilton

- Oversaw the R&D division and the technical division of the team, designed training material and led training for new members
- Led R&D projects on optimal extrusion fillet radius, crosswind boundary conditions validation, rolling and static wheels simulations and mesh sensitivity test
- Evaluated aerodynamic performances of original and enemy aerobodies with specification in canopy and flange designs with 3D modelling and CFD simulation with textbook verifications, informed subsequent design iterations

AWARDS

[ETH] Excellence Scholarship (ESOP)	2025
[UofT] Vector Scholarship in Artificial Intelligence (declined)	2025
[UofT] Dean's List	2021–2024
[UofT] DCS Academic Travel Grant	2024
[UofT] NSERC Undergraduate Student Research Award	2024, 2025
[UofT] Class of 3T0 and Associates Scholarship in Mathematics and Physics	2023
[UofT] The Chancellor's Scholarship, Trinity College	2022
[UofT] University of Toronto Scholar	2021

SKILLS

Programming: Python [PyTorch, scikit-learn, JAX, NumPy, SciPy, Pandas], C/C++, CUDA, MATLAB, R, HTML/CSS/JavaScript/TypeScript [React] [projects], LaTeX

Tools: Git/GitHub, Shell Scripting, VS Code, Slurm

Modelling & Graphics: Blender, 3ds CATIA, 3D Printing, Pointwise, ANSYS Fluent

Languages: English, Cantonese, Mandarin, French (basic), Japanese (basic)

COMMUNITY

Vice President, UofT Hong Kong Public Affairs & Social Services Society Sep 22' – Apr 23'

- Led meetings and collaboration with community partners in club events

Vice President, UofT Cantonese Debate Society Sep 22' – Apr 23'

- Led meetings, team training and team building activities for a team of 10+ members