Allison Tsz Kwan Lau

+1 (416) 817-8650 allison.lau@mail.utoronto.ca

Education

University of Toronto, Canada Sep 2021 – Apr 2025
B.S. in Computer Science (*Specialist*), Physics (*Major*), Mathematics (*Minor*) *cGPA: 3.89/4.0*

Courses: Computer Graphics, Numerical Methods, Algorithm Design and Analysis, Neural Networks and Deep Learning, Introduction to Image Understanding, Introduction to Visual Computing, Operating Systems

Awards: Dean's List (2021–2023), NSERC Undergraduate Student Research Award (2024), Class of 3T0 and Associates Scholarship in Mathematics and Physics (2023–2024), The Chancellor's Scholarships (2022–2023), University of Toronto Scholar (2021–2022)

Research Experience

Toronto Computational Imaging Group, University of Toronto Sept 2024 –
Supervisor: David Lindell

- Working with a coherent LiDAR prototype system to capture measurements and develop computational algorithms for 3D sensing, velocimetry and polarization imaging

Machine Learning and Computational Healthcare, Vector Institute May 2024 –
Supervisor: Rahul G. Krishnan

- Explored memorization mechanisms and fine-tuning methods in Large Language Models (LLMs) and conducted extensive literature review
- Implemented and trained machine learning models utilizing PyTorch on CUDA-enabled GPUs
- Leading a project on using a history dependent direct preference optimization algorithm for training in-context online adaptation of LLMs [1]

Medical Computer Vision and Robotics, University of Toronto Jan – May 2024
Supervisor: Lueder Alexander Kahrs

- Explored finite element method (FEM) in physics-based animation and various hyper-elastic models
- Researched, planned experiments and developed automation for closure dynamics simulation of rhomboid surgical flaps with FEM for determining optimal undermining area of rhomboid skin flap [2]

Snyder Lab, Stanford University Jan 2024 –
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]
- Managed communication with potential collaborator wearable brands and data banks on data access and integration

Dunlap Institute, University of Toronto May – Aug 2023
Supervisor: Ting Li

- Developed python scripts to automate the testing of CMOS detectors for space imaging
- Conducted comprehensive analysis of critical detector characteristics such as linearity, dark current and salt and pepper noise [3]

Blue Sky Solar Racing, University of Toronto May 2023 –
Subteam faculty consultant: Amy Bilton

- Lead of Aerodynamics subteam, oversees the R&D division and the technical division, organized onboarding material and led training for new members
- Communicate with faculty consultants, safety board members, and external testing facilities to arrange full scale wind tunnel testing of the aerobody
- Designed and analyzed aerodynamic performances of original and enemy aerobodies with specification in canopy and flange designs with CAD using 3ds CATIA, Pointwise mesh generation and CFD simulation with textbook verifications
- Developed crosswind standardization and journal scripts in PyFluent for conceptual and detailed design of solar car for FSGP 2025 and WSC2027

Publications

1. **Personalized Adaptation via In-Context Preference Learning**
   Allison Lau, Younwoo Choi, Vahid Balazadeh, Keertana Chidambaram, Vasilis Syrgkanis, Rahul Krishnan
   NeurIPS 2024 Workshop on Adaptive Foundation Models

2. **Analyzing the effect of undermining on suture forces during simulated skin flap surgeries with a three-dimensional finite element method**
   Wenzhangzhi Guo, **Allison Lau**, Joel C. Davies, Vito Forte, Eitan Grinspun, Lueder Alexander Kahrs
   EG VCBM 2024

3. **Beyond CCDs: Characterization of sCMOS detectors for optical astronomy**
   Aditya Khandelwal, Sarik Jeram, Ryan Dungee, Albert Lau, **Allison Lau**, Ethen Sun, Phil Van-Lane, Shaojie Chen, Aaron Tohuvavohu, Ting Li
   SPIE Astronomical Telescopes + Instrumentation (AS24 Yokohama, Japan)

Course Projects

1. **ADAM-Add: Enhancing ADAM with Adaptive Decay Rates** [code]
   Lemeng Dai, **Allison Lau**, Wenrui Wu (*CSC413/2516*)

Skills

Programming: Python [PyTorch, scikit-learn, JAX, NumPy, SciPy, Pandas], C/C++, MATLAB, R, HTML/CSS/JavaScript, 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)

Community

Vice President, UofT Hong Kong Public Affairs & Social Services Society Sep 2022 – Apr 2023

- Led the editing of annual society publication
- Secured sponsorship and collaborated with community partners in club events

Vice President, UofT Cantonese Debate Society Sep 2022 – Apr 2023

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