





LAURA MADRID

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EDUCATION

University of Toronto - Honours Bachelor of Science (HBSc)

Sep 2019 – Jun 2024

Department of Mathematical & Computational Sciences: Computer Science Specialist

Mississauga, Ontario

• Relevant courses:

CSC420: Introduction to Image Understanding
CSC384: Introduction to Artificial Intelligence
CSC311: Introduction to Machine Learning
CSC413: Neural Networks and Deep Learning

CSC376: Fundamentals of Robotics
CSC379: Introduction to Medical Robotics
CSC477: Introduction to Mobile Robotics

HONOURS & SCHOLARSHIPS

Summer Undergraduate Research Fair (SURF) - Featured Oral Presentation

Aug 2024

- Independently delivered an oral presentation on the Indoor Rock Climbing Assistance Tool (IRCAT) at the 2024 University of Toronto Summer Undergraduate Research Fair.

1st Place - 2024 UTMSU'S Undergraduate Research Symposium

Apr 2024

- Our team won first place in the competition for our **poster** and presentation. Award Value: \$1,000.

UTM Undergraduate Research Grant

Nov 2023

- Our team received a UTM Undergraduate Research Grant to support our research on the Indoor Rock-Climbing Assistance Tool (IRCAT). Award Value: \$1,500.

C Magazine Award for Excellence in DRAWING 1 - 2022 Annual Awards Gala

Nov 2022

UTM News Article Feature

Sep 2022

- Featured in 'It's a really cool place': UTM undergrads get hands-on experience with new robotics teaching lab.

2nd Place - Zillow's Internal Yearly Hackathon

Apr 2022

- Our team won second place in the Product Features & Business Ideas category for introducing the RoomPlan API.

Palantir's Women in Technology Scholarship - North America

Apr 2021

- Scholarship to support and celebrate women who are beginning careers in technology. Award Value: \$7,000.

Artwork Featured at The Take Action Gallery

Apr 2021

- My artwork, **Pattern of Life - Space, Egg, Eye Continuum**, was featured for the entire month of April at the Take Action Gallery.

RESEARCH EXPERIENCE

Research Assistant - Medical Computer Vision & Robotics Lab

Jan 2024 – Present

Supervisors: Professor Lueder Kahrs and Julia Wiercigroch

- Developing an internal application to analyze vocal fold movement in laryngoscopies using **OpenCV** and **SciPy**, enabling automatic identification of larynx and trachea landmarks with HSV color masks, a **DeepLabCut** model for annotation, and a **segmentation model** to focus on specific anatomical regions.

Computer Vision for Assisted Indoor Climbing Project

Sep 2023 – Present

Supervisors: Professor Lisa Zhang and Professor Daniel Zingaro — Teammates: Asad Khan, Lucas Noritomi-Hartwig

- Developed the Indoor Rock-Climbing Assistance Tool (IRCAT) using **OpenCV** for pose estimation and **YOLOv8** for rock hold detection to guide visually impaired climbers throughout their ascent of the route.
- Managed HSV values for **route classification** and created a user-friendly interface.
- Submitted a **poster** to NVIDIA GTC 2025.

Brain Tumor Classification Model - Capstone Design Course

Sep 2023 – Dec 2023

Supervisor: Professor Anthony Bonner — Teammates: Lucas Noritomi-Hartwig, Keshav Worathur

- Developed a classification model for glioma, meningioma, and pituitary tumors shown in MRI scans, enhancing diagnostic accuracy through data augmentation and interpretability techniques like **saliency maps**.

Integration of Ethics into the Computer Science Program

Jan 2023 – Apr 2023

Supervisor: Professor Micheal Pawliuk — Teammates: Zosia Kniter, Nikki Smith

- Conducted interviews with faculty members from the Computer Science and CCIT departments from the University of Toronto Mississauga and researched various university ethics programs in Computer Science to propose an **ethical framework** for teaching ethics to Computer Science students.

WORK EXPERIENCE

Graduate Research Assistant - UTM Co-op Internship Program (UTMCIP) Sept 2024 – Present
University of Toronto - Experiential Education Unit *Mississauga, Ontario*

- Support the launch of the UTMCIP by providing disciplinary expertise and assisting in the delivery and evaluation of Work-Readiness Modules.

Computer Vision Software Engineering Intern May 2024 – Nov 2024
AIRY3D - Core Team *Montreal, Quebec*

- Researched and implemented SOTA **outlier removal** methods for captured point clouds in **C++** and integrated the best method into the AiryApp with **CUDA** achieving a 1,000x speedup.
- Developed an **ISP** (Image Signalling Processor) pipeline in **C++** using **OpenCV**.

Teaching Assistant Sep 2021 – Apr 2024
University of Toronto - Department of Computer Science *Mississauga, Ontario*

- I conducted tutorials for 20-40 students, co-created slides, held office hours, assisted students on discussion boards, and graded assignments, midterms, and exams.
- Courses Taught:**
 - CSC 343: Introduction to Databases (Winter 2023)
 - CSC 398: Current Approaches to Ethics for Computer Scientists (Fall 2023)
 - CSC 108: Introduction to Computer Programming (Fall 2021, Fall 2023)
 - CSC 258: Computer Organization (Winter 2022)
 - CSC 148: Introduction to Computer Science (Winter 2021, Winter 2022)
 - CSC 236: Introduction to the Theory of Computation (Fall 2022)

Software Development Engineering Intern May 2023 – Aug 2023
Zillow - Rich Media Experiences (RMX) Team *Remote*

- Integrated Apple's **RoomPlan API** into the AR room capture app, streamlining a multi-step manual process into a single iPhone scan.
- Implemented **ARSession relocation**, and 2D/3D floor plan generators with furniture.
- Delivered a comprehensive report to the RMX team, incorporating key WWDC23 updates for ongoing initiatives.

Zillow Engineering & Leadership (ZEAL) intern Jun 2022 – Aug 2022
Zillow *Remote*

- Completed **rotational projects** with the Rental Revenue Platform (RRP), Premier Agent iOS Mobile (PA iOS), and Constellation Design System (CDS) teams, and participated in Zillow's annual Hackweek competition.
- RRP Team:** Enhanced data handling efficiency by streamlining database access, using a Java Job Trigger to export Parquet-format tables to the **AWS Datalake**.
- PA iOS Team:** Developed a contact details page for Real Estate agents using **UIKit** and **JSON** data parsing.
- Hack-week Competition:** Team won 2nd place in the Product Features & Business Ideas category, for which I modified **USDx** models using the **RoomPlan API**.
- CDS Team:** Redesigned the Constellation documentation platform and improved navigation via an upgraded search UI with **React**, **GraphQL**, and **Styled Components**.


Software Development Intern Jun 2021 – Aug 2021
Tiary Inc. *Toronto, Ontario*

- Revamped web pages (Blog, FAQ, Checkout, Order Tracking) using **React** and developed Tiary Studios' info site with **JavaScript**, **Gatsby**, and **GraphQL**, improving site functionality and user experience.


Product Marketing Management Intern Jul 2019 – Aug 2019
Microsoft *Mississauga, Ontario*

- Developed a **PowerApps** Inventory Management Platform with a team of 5, reducing marketing material request time and demoed the application at **Microsoft's 2019 National Annual General Meeting**.

EXTRACURRICULAR & VOLUNTEER INVOLVEMENT

Website Manager - Women in Science & Computing (WiSC) UTM  Sep 2021 – May 2022

- Designed and developed the organization's website using Gatsby, Contentful, HTML, CSS, and JavaScript and collaborated with executives to enhance usability and ensure scalability.

VP Events Coordinator - UTM Robotics Club  Apr 2020 – May 2021

- Co-developed the second iteration of the UTM Robotics website using Gatsby, Contentful, HTML, CSS, and JavaScript, collaborated with club members, graduate students, and professors for initiatives, and created content to promote events and introduce students to robotics on social media.

Midfielder - UTM Tri-Campus Soccer League  Jan 2020 – May 2021

- Played with the team in the Winter 2020 and Winter 2021 indoor soccer seasons.

LICENSES & CERTIFICATIONS

Linear Algebra for Machine Learning and Data Science 	Oct 2024
AI for Good Specialization 	Sep 2024
• Courses completed: AI and Public Health, AI and Climate Change, AI and Disaster Management	
TCPS 2: CORE-2022 (Course on Research Ethics)	Oct 2022
DELF B1 Certification	May 2019

SKILLS & COURSES

- Languages:** Spanish (Native), English (Fluent), French (DELF B1), Italian (Beginner)
- Developer Tools:**
- OpenCV, YOLO, PyTorch, TensorFlow, SciPy, CUDA
 - Deeplabcut, libfranka, ROS, Gazebo, RoomPlan
 - Python, C++, Swift, Javascript, HTML, CSS, React
 - PostgreSQL, Firebase, AWS, Docker, Gatsby, GraphQL, Figma