

Laura Madrid

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Research interests

Computer Vision, AI for Good, Human Computer Interaction, Healthcare, Conservation

Education

- 2019 – 2024 **University of Toronto** – Mississauga, Ontario
HBSc in Computer Science
Mentors: Professors Michael Liut, Lisa Zhang, Lueder Kahrs, Daniel Zingaro, Micheal Pawliuk.

Research Experience

- 2024 **Experiential Education Unit - University of Toronto** – Mississauga, Ontario
Graduate Research Assistant - UTM Co-op Internship Program (UTMCIP)
Support the launch of the UTMCIIP by providing disciplinary expertise and assisting in the delivery and evaluation of Work-Readiness Modules.
- 2024 **MEDCVR Lab - University of Toronto** – Mississauga, Ontario
Research Assistant - Medical Computer Vision & Robotics Lab
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 and a DeepLabCut model for annotation.
- 2023 **Computer Vision for Assisted Indoor Climbing** – Mississauga, Ontario
Supervisors: Professors Lisa Zhang, Daniel Zingaro
Teammates: Asad Khan, Lucas Noritomi-Hartwig
Developed a system using OpenCV for pose estimation and YOLOv8 for rock hold detection to aid visually impaired climbers. Managed HSV values for route classification and created a user-friendly interface. I presented the project at the 2024 University of Toronto Summer Undergraduate Research Fair.
- 2023 **Brain Tumor Classification - Capstone Design Course** – Mississauga, Ontario
Supervisor: Professor Anthony Bonner
Teammates: Lucas Noritomi-Hartwig, Keshav Worathur
Developed an automatic classification model for glioma, meningioma, and pituitary tumors using MRI scans, enhancing diagnostic accuracy through data augmentation and interpretability techniques like saliency maps.

2023 **Integration of Ethics into the Computer Science Program** – Mississauga, Ontario

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.

Industry Experience

2024 **AIRY3D (Computer Vision Software Engineering Intern)** – Montreal, Quebec

- Researched and implemented SOTA outlier removal methods for captured point clouds in **C++**.
- Developed an ISP (Image Signalling Processor) pipeline in **C++** using **OpenCV**.

2023 **Zillow (Software Development Engineering Intern - 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 relocalization**, and 2D/3D floor plan generators with furniture.
- Delivered a comprehensive report to the RMX team, incorporating key WWDC23 updates for ongoing initiatives.

2022 **Zillow (Zillow Engineering & Leadership (ZEAL) Intern)** – 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.

2021 **Tiary Inc. (Software Development Intern)** – 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.

2019 **Microsoft (Intern)** – Mississauga, Ontario

- Developed a **PowerApps** Inventory Management Platform, reducing marketing material request time and presenting it at Microsoft's National Annual General Meeting.

Teaching experience

Teaching Assistant – University of Toronto Mississauga

I served as a Teaching Assistant for various undergraduate courses while completing my undergraduate program, where my responsibilities included running tutorials for 20-40 students, creating tutorial slides, marking assignments, midterms, and exams, holding office hours, assisting students on discussion boards, and invigilating exams.

Winter 2023 **CSC 343: Introduction to Databases**

A third-year undergraduate course introducing database management systems, SQL, and database design concepts.

Coordinator: Professor Michael Liut.

Fall 2023 **CSC 398: Current Approaches to Ethics for Computer Scientists**

A third-year undergraduate course addressing ethical issues in various areas of computer science.

Coordinator: Professor Micheal Pawliuk.

Fall 2023, **CSC 108: Introduction to Computer Programming**

Fall 2021 A first-year course introducing programming in Python, focusing on problem-solving and programming fundamentals.

Coordinator: Professor Michael Liut.

Fall 2022 **CSC 236: Introduction to the Theory of Computation**

A second-year undergraduate course covering mathematical induction, correctness proofs, recurrence relations, automata, and formal languages.

Coordinator: Professor Michael Liut.

Winter 2022 **CSC 258: Computer Organization**

A second-year undergraduate course focusing on computer architecture, machine languages, and instruction execution.

Coordinator: Professor Andrew Petersen.

Winter 2022, **CSC 148: Introduction to Computer Science**

Winter 2021 A first-year course covering fundamental concepts of computer science and basic data structures.
Coordinator: Professor Michael Liut.

Honors and Scholarships

2024 **1st Place - UTMSU'S Undergraduate Research Symposium**

Our team won first place in the competition for our [poster](#) and presentation. Award Value: \$1,000.

2023 **UTM Undergraduate Research Grant**

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

2021 **Palantir's Women in Technology Scholarship - North America**

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

2019 **University of Toronto Entrance Scholarship**

Awarded for academic excellence upon admission to the University of Toronto Mississauga. Award Value: \$3,000.