linkedin.com/in/laura-madrid/
laura.madrid@utoronto.ca
github.com/Laura05010
www.lauramadrid.ca

Laura Madrid

Education

University of Toronto - Honours Bachelor of Science (HBSc) Sep 2019 – Jun 2024
Department of Mathematical & Computational Sciences: Computer Science Specialist *Mississauga, Ontario*

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.

Teaching Experience

CSC 343: Introduction to Databases Winter 2023

Teaching Assistant

- Coordinator: Professor Michael Liut
- A third-year undergraduate course introducing database management systems, SQL, and database design concepts.
- I ran bi-weekly tutorials for 20-40 students and marked assignments, midterms, and exams.

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

Teaching Assistant

- Coordinator: Professor Micheal Pawliuk
- A third-year undergraduate course addressing ethical issues in various areas of computer science.
- I ran tutorials for ∼30 students, co-created tutorial slides and marked assignments.

CSC 108: Introduction to Computer Programming Fall 2023, Fall 2021

Teaching Assistant

- Coordinator: Professor Michael Liut
- A first-year course course introducing programming in Python, focusing on problem-solving and programming fundamentals.
- I held office hours, assisted students on discussion boards, marked assignments, midterms, and exams, and invigilated exams.

CSC 258: Computer Organization Winter 2022

Teaching Assistant

- Coordinator: Professor Andrew Petersen
- A second-year course focusing on computer architecture, machine languages, and instruction execution.
- I ran 3 sections of bi-weekly tutorials for ∼30 students, co-created tutorial slides, and marked labs, assignments, midterms, and exams.

CSC 148: Introduction to Computer Science Winter 2022, Winter 2021

Teaching Assistant

- Coordinator: Professor Michael Liut
- A first-year course covering fundamental computer science concepts and basic data structures.
- I held office hours, assisted students on discussion boards, marked assignments, midterms, and exams.

CSC 236: Introduction to the Theory of Computation Fall 2022

Teaching Assistant

- Coordinator: Professor Michael Liut
- A second-year course covering mathematical induction, correctness proofs, recurrence relations, automata, and formal languages.
- I co-created tutorial slides, assisted students on discussion boards, marked assignments, midterms, and exams.

Industry Experience

Experiential Education Unit - University of Toronto Sept 2024 – Present

Graduate Research Assistant- UTM Co-op Internship Program (UTMCIP) *Mississauga, Ontario*

- Support the launch of the UTM Co-op Internship Program (UTMCIP) by providing disciplinary expertise and assisting in the delivery and evaluation of Work-Readiness Modules.

AIRY3D - Core Team May 2024 – Nov 2024

Computer Vision Software Engineering Intern *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.

Zillow - Rich Media Experiences (RMX) Team May 2023 – Aug 2023

Software Development Engineering Intern *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.

Zillow Jun 2022 – Aug 2022

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 2^{nd} 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.

Tiary Inc. Jun 2021 – Aug 2021
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.

Microsoft Jul 2019 – Aug 2019
Intern *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: Python, C++, Swift, Deeplabcut, OpenCV, PyTorch, TensorFlow, YOLO, RoomPlan, React, Gatsby, Firebase, AWS, HTML, CSS, PostgreSQL, Figma

Relevant Courses: Image Understanding, Machine Learning, Neural Networks and Deep Learning, Medical Robotics, Mobile Robotics, Ethics for Computer Scientists.