Valeria Ramirez Osorio

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Education

University of Toronto — Honours Bachelor of Science
Computer Science Specialist and Mathematics Minor — *Completion Expected June 2025*

- 3.6 CGPA/4.0
- Dean's List (2021, 2022, 2023, 2024)

Research Interest

Research focused on Human-Computer Interaction (HCI) and its impact on enhancing computer science education. Emphasis on exploring how interactive technologies, user-centered design, and accessible interfaces improve learning and user experiences. Additionally, data analysis and processing techniques to inform teaching practices, curriculum development, and personalized learning, aiming to bridge the gap between theoretical foundations and practical applications in technology and education.

Skills Highlights

Software Skills

- Python, Java, JavaScript, Node.js, C, C++, Assembly, Bash, HTML and CSS, UNIX/Linux, Microsoft Products.
- Web and Application Development, Frontend and Backend, Graphic Design, Automation, Model Evaluation and Optimization, High Critical Thinking Skills, Object-Oriented Design, Complexity Analysis, Algorithms

Data Science Skills

- MySQL, PostgreSQL, R, Microsoft Excel, Google Cloud Platform, Docker, Kubernetes
- Data Interpretation and Manipulation, Neural Networks, Numerical analytics, Probability and Statistics

Spoken Language Skills

- English, Spanish, French

Professional Experience

Application and Database Developer — September 2024 – Present
University of Toronto, Historical Department — *Mississauga, Ontario*

- Created and implemented a specialized website to organize and present the Department of Historical Studies' extensive collection of crossbow archives from across the globe. The platform serves as a centralized database where users, including university researchers and students, can contribute new items, view detailed historical records, and track archived items. Additionally, it provides a space for students to showcase their research findings.
- Developed both front-end and back-end of the platform, utilizing technologies such as SQL, Oracle, Omeka, React, Node.js, JavaScript, and HTML to create a user-friendly and scalable system that supports dynamic content and secure data management, all while managing tasks independently with weekly meetings for progress updates.
- Regular communication with the supervisor allowed for continuous feedback and ensured alignment with project goals and expectations.

Teaching Assistant — September 2022 – Present
University of Toronto, Computer Science Department — *Mississauga, Ontario*

- Facilitated engaging tutorials, supported lecture delivery, graded assessments, invigilated exams, and provided individualized academic assistance through office hours to enhance student learning outcomes.
- Assisted in second-year computer science courses, Introduction to Computational Theory and Computer Organization, as well as third-year computer science course Introduction to Databases.

Computer Science and Mathematics Tutor — September 2024 – Present
Self-employed — *Mississauga, Ontario*

- Created engaging lessons and exercises to help high school and university students improve their understanding of complex topics, utilizing diverse teaching methods to accommodate various learning styles and encourage active problem-solving.

- Taught Advanced Functions, Calculus, Computer Science, and Programming Languages (Java and Python), adapting instructional techniques to individual student needs and fostering a dynamic, interactive learning environment.

Summer Student Engineering Internship 2021, 2022, 2023, 2024

Bell Mobility *Toronto, Ontario*

- Led annual projects aimed at enhancing team efficiency, including application development, inventory database implementation, and software testing/debugging through Python, Java, JavaScript, HTML, SQL, etc.
- Developed an automation application integrating XCAL software with Python and JavaScript, enabling seamless interaction with a Slack channel. Users could send commands and receive real-time test results, allowing thousands of cellular tests to run on physical hardware without requiring continuous monitoring. This significantly reduced manual oversight and increased testing efficiency.
- Designed and implemented a full-stack application for managing live hardware, including cellular network components such as radios and active network cells. The platform functioned as a real-time database and control center, allowing users to monitor, manipulate, and troubleshoot hardware. Key features included the ability to turn devices on/off, activate alerts, and retrieve live performance reports, providing a more efficient and user-friendly approach to network management.
- Contributed to major initiatives, such as 5G Slicing, RAN, and SRE, through collaboration, effective communication, in Agile and Scrum practices. Used Jira and Confluence to manage the SDLC and ensure timely project delivery.
- Applied strong problem-solving, adaptability, and analytical skills to develop innovative solutions, streamline operations, and enhance collaboration within a fast-paced, results-driven environment. Managed competing priorities effectively while fostering a productive and cohesive team dynamic.

Recent Relevant Projects

Multiple Representations in Introductory Programming: A Pilot Study | September 2024 – Present

- Worked under a PhD student and three professors at the University of Toronto on a pilot study exploring the impact of multiple visualizations in programming education. Developed and refined interactive exercises for integration into first-year computer science courses.
- Designed and implemented the backend of interactive programming exercises using JavaScript, Python, and HTML to support first-year computer science students in learning Python. These exercises featured three synchronized visualizations—code execution, memory representation, and real-world analogies—to enhance conceptual understanding.
- Collected, reviewed, and analyzed student feedback on the instructional tools, assessing their effectiveness in improving programming comprehension. Provided insights to refine the visualizations and optimize the learning experience.

Understanding the Impact of Using Generative AI Tools in a Database Course | May 2024 – August 2024

- Collaborated with two professors and a graduate student to construct a seven page research paper recently published by SIGCSE for data scientists and professionals at the SIGCSE '25 conference.
- Manipulated and organized quantitative and qualitative data using Python and Microsoft Excel to extend tends for computer science professor to understand interaction of students and GenAI in database courses.
- Investigated how GenAI tool usage influenced student performance, engagement, and skill development in a third-year database course, providing data-driven recommendations for educators on supervised AI integration in coursework.

AI Ethics Research | September 2024 – December 2024

- Partnered with a university professor at the Univrsity of Toronto, Mississauga, to conduct an in-depth comparative analysis of two competing AI Ethics textbooks, evaluating their approaches, strengths, and limitations in teaching Ai ethics within computer science education.
- Investigated the importance of AI ethics in computer science courses, assessing how ethical frameworks should be taught and identifying the most effective textbook for future AI ethics curricula.
- Presented research findings and recommendations to a panel of computer science and mathematics professors at the University of Toronto, contributing to ongoing discussions on integrating AI ethics into higher education.

Computer Vision-Based Object Detection | January 2024 – April 2024

- Applied learnings from a Computer Vision course, CSC420, to develop an object detection model for identifying various furniture pieces in images, comparing object detection and segmentation techniques to determine the most effective approach.

- Developed The Room Whistler, with another undergraduate student. A project that constructs a bird's-eye view of a furnished room, leveraging homography concepts and feature detection to explore optimal furniture arrangements and spatial templates.
- Implemented the Depth Anything algorithm to extract pixel depth, calculated 3D coordinates using camera parameters, and generated bounding boxes to visualize detected furniture in a room's spatial context.

Publications

Sibia, N., Ramirez Osorio, V. , Zavaleta Bernuy, A. , Aivaloglou, E., Engineer, R., Petersen, A., Liut, M., & Nobre, C. (2024, November). *Exploring the Impact of Multiple Representations in Introductory Programming: A Pilot Study.* Proceedings of the 24th Koli Calling International Conference on Computing Education Research. ACM. Retrieved from https://dl.acm.org/doi/10.1145/3699538.3699587

Ramirez Osorio, V. , Zavaleta Bernuy, A., Simion, B., & Liut, M. (2025, February 18). *Understanding the impact of using generative AI tools in a database course: Proceedings of the 56th ACM technical symposium on computer science education v. 1.* ACM Conferences. Retrieved from https://dl.acm.org/doi/10.1145/3641554.3701785

Extracurriculars

- Active member of the Women in Computer Science organization (WiCS)
- Active member and volunteer of the UTM Computer Science Student Community
- Writer on The Medium, University of Toronto Mississauga's student newspaper.
- Active member of the Mathematical and Computational Sciences Society (MCSS)
- Active member of UTM Women & Gender Equity Centre (WGEC)