Ismael Villegas Molina

ismaelvm@ucsd.edu
ismaelv.github.io

Education

Doctorate of Philosophy in Computer Science — Expected June 2026

University of California, San Diego | Jacobs School of Engineering
Advisors: Adalbert Gerald Soosai Raj, Leo Porter, Bill Griswold
Thesis Title: The Design, Deployment, and Evaluation of Culturally Relevant Computing Resources for U.S. Latine Students in Higher Education

Master of Science in Computer Science — May 2021

University of Southern California | Viterbi School of Engineering

Bachelor of Science in Computer Science — May 2019

Columbia University | The Fu Foundation of Engineering and Applied Science
Emphasis in Intelligent Systems

Grants and Fellowships

National Science Foundation Award 2417787 ($300,000 | 2 years) — 2024

Project Title: Generation and Evaluation of Culturally Relevant Computing Resources for Latines in Introductory Programming
Project Role: Lead PhD Student; Lead Writer
Project Team: Gerald Soosai Raj (PI)
Funding Period: September 2024 – August 2026
Description: Aiming to enhance computer science education to Latine students, create a culturally relevant textbook for introductory computing courses, and assess the textbook's efficacy on Latine student engagement, learning, and retention compared to traditional textbooks.

Gates Millennium Scholar — 2015

Funding Period: 10 years
Description: Highly competitive, fully funded scholarship awarded to high-achieving, underrepresented minority students.

GEM Fellow (Master's and Doctoral Awards) **2019 & 2021**

Funding Period: Full master's degree; First year of doctoral degree
Description: Highly competitive national initiative providing underrepresented students in STEM fields with graduate fellowships, professional development opportunities, and internships at leading companies and research institutions, supporting the pursuit of master's and doctoral degrees in engineering and science.

Alfred P. Sloan Research Fellow **2021**

Funding Period: 4 years
Description: Distinguished program that supports graduate students pursuing advanced degrees in STEM fields, particularly those from underrepresented groups.

Hispanic Scholarship Fund Scholar **2015**

Funding Period: 4 years (in collaboration with Gates Millennium)
Description: Highly regarded program providing financial support and resources to outstanding Hispanic students pursuing higher education.

Teaching

University of California, San Diego

CSE 8A: Introduction to Computer Science	Instructor of Record	Summer 2025
	Teaching Assistant	Winter 2023 Spring 2023 Summer 2023

Upward Bound — Imperial Valley

Exploring Computer Science	Instructor	Summer 2022

Research Experience

Latine Students in Computing **2021 - Present**

University of California, San Diego | La Jolla, CA

- Received Broadening Participation in Computing (BPC) grant from NSF
- Created a new research initiative to understand and improve the U.S. Latin American experience in computing
- Taught summer course to bilingual high school students through the Upward Bound program
- Spanning research into culturally-relevant computing for U.S. Latine students, and expanding to Black and Indigenous students

Student-Tutor Interactions **2021 - Present**

University of California, San Diego | La Jolla, CA

- Designed and executed a qualitative research study on tutor perspectives of student-tutor interactions, including their struggles and barriers to providing optimal teaching strategies
- Designed and executed a mixed-methods research study on students interacting with a large language model tutor and their perspectives on its use in the classroom – particularly from the non-native English speaking population

Psychoacoustic Annoyance in Autonomous Vehicles **Summer 2018**

University of California, Berkeley | Berkeley, CA

- Helped with the design and execution of a quantitative research study on how psychoacoustic annoyance can be calculated and used in vehicles based on deep reinforcement learning

Columbia University Speech Lab **2017 - 2019**

Columbia University | New York, NY

- Helped design and execute a quantitative research study on spontaneous Spanish-English code-switching. Data to be used in machine learning models to more accurately predict when a language switch would happen in sentences
- Took scraped bilingual data and determined if any two given files belong together as parallel data. Performed word alignments for Somali-English and Swahili-English parallel documents

Work Experience

The MITRE Corporation **Summer 2021**

Graduate Research Scientist | San Diego, CA

- Part of Artificial Intelligence and Autonomy Innovation Center
- Created Jupyter notebooks for image generation frameworks (StyleGAN, StyleGAN2) using Pytorch with detailed process of how to create and detect synthetic images

Amazon **Summer 2020**

Applied Science Research Intern | Seattle, WA **Summer 2019**

- Part of Amazon Web Services' Lex Science Team
  - Worked on data augmentation methods to create better chatbot developing experience for customers
  - Developed self-training approach starting with small, annotated data seeds used to train a machine learning model. Use that model to create predictions on unannotated data. Use the original and newly predicted annotations to create

machine learning model that shows high performance with small amount of gold standard data
- Part of Amazon's Customer Service ML Team
  - Created the answer extraction model for a question-answering pipeline. Given a question and a document that contains an answer to that question, extract the correct answer. Used various machine learning architectures such as BERT and XLNet. Used data augmentation techniques to improve on initial dataset

Goldman Sachs & Co. **Summer 2017**

Summer Analyst | New York, NY

- Part of Fixed Income, Currencies, and Commodities (FICC) tech team
  - Created JUnit tests for existing programs
  - Worked on post-trade processing with various venues (Tradeweb, Bloomberg, Brokertec) to process trades made by European Repo Desk. Used JMS and EMS to connect and receive messages from trades all from scratch. Done in part to increase transparency of markets, lower cost of market data, and have more explicit costs of trading and investing securities

Publications

For an up-to-date list, check my Google Scholar profile.

1. **Ismael Villegas Molina**, Emma Hogan, Nawab Mulla, Josue Martinez, Bill Griswold, Leo Porter, and Adalbert Gerald Soosai Raj. *Faculty Identities and Their Effects on Implementing Culturally Relevant Pedagogies at Hispanic-Serving Institutions*. Proceedings of the 3rd ACM Global Computing Education Conference (CompEd). October 2025.
2. **Ismael Villegas Molina**, Emma Hogan, Josue Martinez, Nawab Mulla, Bill Griswold, Leo Porter, and Adalbert Gerald Soosai Raj. *Faculty Reasons For Using or Refraining From Culturally Relevant Pedagogies at Hispanic-Serving Institutions*. Proceedings of the 2025 Conference on Research on Equitable and Sustained Participation in Engineering, Computing, and Technology (RESPECT). July 2025.
3. **Ismael Villegas Molina**, Emma Hogan, Nawab Mulla, Josue Martinez, Bill Griswold, Leo Porter, and Adalbert Gerald Soosai Raj. *Faculty Implementation of Culturally Relevant Pedagogies at Hispanic-Serving Institutions*. Proceedings of the 30th ACM Conference on Innovation and Technology in Computer Science Education (ITiCSE) V. 1. June 2025.
4. **Ismael Villegas Molina**, Audria Montalvo, Benjamin Ochoa, Paul Denny, and Leo Porter. *Leveraging LLM Tutoring Systems for Non-Native English Speakers in Introductory CS Courses*. Proceedings of the 2025 ASEE Annual conference & Exposition. June 2025.
5. **Ismael Villegas Molina**, Jeannie Kim, Audria Montalvo, Apollo Larragoitia, Rachel S. Lim, Philip Guo, Sophia Krause-Levy, and Leo Porter. *Undergraduate Computing Tutors' Perceptions of their Roles, Stressors, and Barriers to Effectiveness*. Proceedings of the 56th ACM Technical Symposium on Computer Science Education V.1 (SIGCSE), February 2025.
6. **Ismael Villegas Molina**, Audria Montalvo, Mollie Jordan, Shera Zhong, and Adalbert Gerald Soosai Raj. *Generation and Evaluation of a Culturally-Relevant CS1 Textbook for Latines using Large Language Models*. Proceedings of the 29th ACM Conference on Innovation and Technology in Computer Science Education (ITiCSE), July 2024.
7. **Ismael Villegas Molina**, Audria Montalvo, and Adalbert Gerald Soosai Raj. *U.S. Latines in Computing: A Review of the Literature*. Proceedings of the 55th ACM Technical Symposium on Computer Science education V. 1 (SIGCSE), March 2024.

8. Adrian Salguero, **Ismael Villegas Molina**, Lauren Elizabeth Margulieux, Quintin Cutts, Leo Porter. *Applying CSo/CS1 Student Success Factors and Outcomes to Biggs' 3P Educational Model.* Proceedings of the 55th ACM Technical Symposium on Computer Science education V. 1 (SIGCSE), March 2024.
9. Mrinal Sharma, Hayden McTavish, Zimo Peng, Anshul Shah, Vardhan Agarwal, Caroline Sih, Emma Hogan, **Ismael Villegas Molina**, Adalbert Gerald Soosai Raj, and Kristen Vaccaro. *Engagement and Anonymity In Online Computer Science Course Forums*. Proceedings of the 19th ACM Conference on International Computing Education Research (ICER), August 2023.
10. **Ismael Villegas Molina**, Adrian Salguero, Shera Zhong, and Adalbert Gerald Soosai Raj. *The Effects of Spanish-English Bilingual Instruction in a CSo Course for High School Students*. Proceedings of the 2023 Conference on Innovation and Technology in Computer Science Education V. 1 (ITiCSE), June 2023.
11. Rachel S. Lim, Sophia Krause-Levy, **Ismael Villegas Molina**, and Leo Porter. *Student Expectations of Tutors in Computing Courses*. Proceedings of the 54th ACM Technical Symposium on Computer Science Education V. 1 (SIGCSE), March 2023.
12. Sophia Krause-Levy, Rachel S. Lim, **Ismael Villegas Molina**, Yingjun Cao, and Leo Porter. *An Exploration of Student-Tutor Interactions in Computing*. Proceedings of the 27th ACM Conference on Innovation and Technology in Computer Science Education Vol. 1 (ITiCSE), July 2022.
13. Erickson R. Nascimento, Ruzena Bajcsy, Michal Gregor, Isabella Huang, **Ismael Villegas**, and Gregorij Kurillo. *On the Development of an Acoustic-Driven Method to Improve Driver's Comfort Based on Deep Reinforcement Learning*. IEEE Transactions on Intelligent Transportation Systems, March 2020.
14. Erickson R. Nascimento, Ruzena Bajcsy, Gregorij Kurillo, and **Ismael Villegas**. *Acoustic-driven Interior Vehicle Adaptation based on Deep Reinforcement Learning to Improve Driver's Comfort*. Paper and poster at International Conference on Intelligent Robots (IROS) workshop, 2018.

Books

- Ismael Villegas Molina. *Intro to Programming in Python using Culturally-Relevant Computing*. Cogniterra, (underway).

Awards

UCSD Engaged Teaching Scholar **2025**

Through UC San Diego's Expertise in Student-Centered College Teaching Program. Completed over 40 hours of advanced pedagogical training, an independent teaching experience, and a reflective assessment. Demonstrated core competencies in evidence-based, equity-minded teaching practices, and contributed to advancing disciplinary pedagogy through scholarly reflection and instructional design.

UCSD CSE Graduate Award: Excellence in Contributions to Diversity **2024**

Recognizing meaningful efforts to advance equity, inclusion, and diversity within the department and broader STEM community. This award honors sustained contributions such as mentorship, outreach, advocacy, or leadership that foster a more inclusive and supportive environment in computer science and engineering.

Service

UCSD OAR² Graduate Research Affinity Group Mentor **2024 - Present**

Early Research Scholars Program Mentor **2023 - Present**

UCSD CSE Diversity, Equity, and Inclusion Committee **2023 - 2024**

Mentor Graduate Teaching Assistant (UCSD CSE 599) **2023 - 2024**

Reviewer

- ITiCSE 2024; 2025
- SIGCSE TS 2025
- RESPECT 2025
- ICER 2025
- CompEd 2025
- Koli Calling 2025
- TOCE 2025
- NeurIPS 2025
- UIST 2025

Mentorship

- Ph.D. Students
  - Audria Montalvo *(B.S. and Ph.D.)*
- Master's Students
  - Marlyn Arque Rupa *(B.S. and M.S.)*
  - Jeannie Kim *(B.S. and M.S.)*
  - Qi Qi
  - Amith Panuganti
  - Kayla Hom
- Undergraduate Students
  - Josue Martinez | *now a software engineer @ GE Aerospace*
  - Ginger Smith | *now a Ph.D. student @ Carnegie Mellon*
  - Nawab Mulla
  - Ethan Perez
  - Korey Ray
  - Roxanna Ferrer Rios
  - Miguel Castillo
  - Zaide Pasion
  - Apollo Larragoitia

Invited Talks

Cal Poly San Luis Obispo **2025**
Title: Leveraging LLM Tutors for Non-Native English Speakers in Introductory CS Courses

References

Dr. Adalbert Gerald Soosai Raj, Associate Teaching Professor
Computer Science and Engineering
University of California, San Diego
La Jolla, CA 92093-0404
asoosairaj@ucsd.edu

Dr. Leo Porter, Professor
Computer Science and Engineering
University of California, San Diego
La Jolla, CA 92093-0404
leporter@ucsd.edu

Dr. William G. Griswold, Full Professor
Computer Science and Engineering
University of California, San Diego
La Jolla, CA 92093-0404
wgriswold@ucsd.edu

Additional Information

Programming Languages
- Python
- Java
- Javascript/JQuery
- C/C++

Natural Languages
- English — Native Fluency
- Spanish — Native Fluency
- French — Speak, Read, and Write with Basic Proficiency

Citizenships
- Mexico
- United States of America

Interests
- Multi-instrumentalist
    - Piano; Trombone; Trumpet; Baritone; Tuba; Percussion; Voice
- Filmmaker
    - Director; Writer; Actor; Composer

- Eagle Scout with Gold and Bronze Palms
- Taekwondo Black Belt, Kukkiwon certified
- PADI-Certified Scuba Diver