LAURA MELISSA CRUZ CASTRO

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Gainesville, 32611, US

EDUCATION

Ph.D. in Engineering Education Aug 2022
Purdue University, West Lafayette, IN, USA
Dissertation: Learning Analytics Approaches for Decision-Making in First-Year Engineering courses
Advisor: Dr. Kerrie Douglas

M.S. in Computer Engineering Dec 2021
Purdue University, West Lafayette, IN, USA
Advisor: Dr. Mirelle Boutin

B.S. in Statistics Sep 2015
Universidad Nacional de Colombia, Bogota, Colombia
Thesis: Bayesian Approximation for a Split-Plot Design with a Binary Outcome
Co-advisors: Dr. Edilberto Cepeda Cuervo and Dr. Bruce Craig

AWARDS AND HONORS

Pioneering Research with HiPerGator Award 2024
University of Florida
UFIT Research Computing

Leveraging LLMs in Advancing Computing education 2023
University of Florida - Strategic Funding Award
Amount: $474.000 (PI)

MEST: Micro-Electronics Security Training Center 2023
NAVAL SURFACE WARFARE CTR
Amount: $22.1 Million (co-PI)

Nuestro Impacto: An insider look into the connections between our past experiences and teaching and mentoring practices 2023
Best overall paper award
American Society of Engineering Education (ASEE)

Dean's Teaching Fellowship (School of Electrical and Computer Engineering) 2022
College of Engineering, Purdue University
Amount: $22,150

PROFESSIONAL EXPERIENCE

Instructional Assistant Professor Aug 2022 – Present
Department of Engineering Education, Herbert Wertheim College of Engineering
University of Florida
Gainesville, FL, USA

Graduate Research Assistant Aug 2018 – Aug 2022
SEED Laboratory, School of Engineering Education
Purdue University
West Lafayette, IN, USA

Student Consultant May 2018 – Aug 2018
Statistical Consulting Service, Department of Statistics
Purdue University
West Lafayette, IN, USA

Research Scientist Statistics Jan 2016 – Jan 2017
Institute for assessment of education (ICFES)
Colombia Department of Education
Bogota, Colombia

Research Assistant - Junior Statistician Apr 2015 – Jan 2016
Data Science, Buy Behavioral Methods Global Group
Nielsen company
Bogota, Colombia

Note: Any entry preceded by an 'E' is expected to happen.

INVITED TALKS

T6 **Cruz Castro, L. M.** (2024) Mentoring and teaching in engineering workshop. LatinXinBME symposium. *John Hopkins University*

T5 **Cruz Castro, L. M.** (2024) Women in Tech Panel. *Center for undergraduate research. University of Florida*

T4 **Cruz Castro, L. M.**, & Mendoza, J. (2021). Introduction to Programming and Data Analysis. *Women in Mathematics and Statistics Club, University of Florida.*

T3 **Cruz Castro, L. M.**, & Ehsan, H. (2020). The Role of Academic Parents. *ASEE Center for Diversity, Equity, and Inclusion.*

T2 **Cruz Castro, L. M.** (2020). The Role of Meta-Cognition in the Acquisition of Programming Skills. *ASEE Student Chapter, Purdue University.*

T1 **Cruz Castro, L. M.** (2018). Reflection and standards based grading system. *School of Engineering Education Seminar, Purdue University.*

PUBLICATIONS

Peer-reviewed Journal Articles

S-J7 **Cruz Castro, L.M.**, Multani, M.K., Castelblanco, G., Jayasinghe, R.R., Leite, W.L. (in review). Self-Regulation, Scaffolding, and the Illusion of Improvement: A Quasi-Experimental Evaluation of an LLM-Based Programming Help Tool. *IEEE Access*

E-J6 Adekunye, O.J., Golden, J., Minchin, E., Castelblanco, G., **Cruz Castro, L.M.** (in press). An Integrated Analysis of Supply Chain Disruptions in Transportation Projects. *ASCE Journal of Legal Affairs and Dispute Resolution in Engineering and Construction*

J5 Castelblanco, G., **Cruz Castro, L.M.**, Yang, Z. (2024). Performance of a Large-Language Model in scoring construction management capstone design projects *Computer Applications in Engineering Education*

J4 Chu, Yun-Wei., Hosseinalipour, Seyyedali., Tenorio, Elizabeth., **Cruz Castro, L. M.**., Douglas, Kerrie., Lan, Andrew., Brinton, Christopher (2024). Multi-Layer Personalized Federated Learning for Mitigating Biases in Student Predictive Analytics *Transactions on Emerging Topics in Computing.*

J3 Diefes-Dux, H. A., & **Cruz Castro, L. M.** (2022). Reflection types and students' viewing of feedback in a first-year engineering course using standards-based grading. *Journal of Engineering Education.* https://doi.org/10.1002/jee.20452

J2 **Cruz Castro, L. M.**, Magana, A. J., Douglas, K. A., & Boutin, M. (2021). Analyzing Students' Computational Thinking Practices in a First-Year Engineering Course. *IEEE Access, 9*, 33041-33050. https://doi.org/10.1109/ACCESS.2021.3061277

J1 **Cruz Castro, L. M.**, Ortiz, F., & Lemus, D. F. (2016). Construction of a Family Socioeconomic Index for the Students who Present the SABER 11 Test. *Comunicaciones en Estadistica 9*(1), 73–84. https://doi.org/10.15332/s2027-3355.2016.0001.04

Peer-reviewed Conference Proceedings

C23 Yang, Z., Castelblanco, G., **Cruz Castro, L. M.,** Multani, M. K., Proposed Framework for LLM-Based Feedback in LEED Assignments *2025 CIB Conferences*

C22 Tressler, C., Blanchard, J. J., **Cruz Castro, L. M.,** Kapoor, A., Exploring the Impact of Student-Created Review Videos in Two Early Computing Courses *2025 ASEE Annual Conference & Exposition*

C21 Multani, M. K., **Cruz Castro, L. M.,** Integration of Conversational Agents into Learning Management Systems: A Systematized Literature Review *2025 ASEE Annual Conference & Exposition*

C20 Yang, Z., Castelblanco, G., **Cruz Castro, L. M.,** Development of FeedCap: A Tool for Real-Time Writing Feedback in Capstone Design Projects *2025 ASEE Annual Conference & Exposition*

C19 **Cruz Castro, L. M.,** Multani, M. K., Ramirez-Salgado, A., Goncher, A., Victoria, I., Taboada, G., Exploring the Impact of Classroom Composition on Women's Experiential Identity, Interest, and Self-Efficacy in Microelectronics *2025 IEEE Frontiers in Education Conference (FIE)*

C18 **Cruz Castro, L. M.,** Jayasekaran, S., Systematized Literature Review of "Work-Life Balance" and "Women" in Engineering *2025 IEEE Frontiers in Education Conference (FIE)*

C17 Brown, C., **Cruz Castro, L. M.,** Coordinate: A Virtual Classroom Management Tool for Large Computer Science Courses Using Discord *2025 ACM Technical Symposium on Computer Science Education (SIGCSE TS), Pittsburgh, PA.*

C16 Goncher., A., **Cruz Castro, L. M.,** Exploring the Interest in Microelectronics of Computer Science and Engineering Students through a Multidisciplinary Approach *2024 ASEE/IEEE Frontiers in Education Conference, Washington, DC.*

C15 **Cruz Castro, L. M.,** Quintana Cifuentes, J., Viability of a Directional Skill-Based Mentoring Program on Communication Skills for Graduate Students in Education and Computer Science Students. *2024 ASEE/IEEE Frontiers in Education Conference, Washington, DC.*

C14 Shinn, Jinnie., **Cruz Castro, L. M.,** Castelblanco, Gabriel., Aggarwal, Ashish., Leite, Walter., Carrol, Bruce (2024) Understanding Optimal Interactions between Students and a Chatbot during a Programming Task. Winter Simulation Conference (WSC)

C13 Victoria, I., **Cruz Castro, L. M.,**., Villanueva, I (2024) The State of the Art of Workforce Development for Engineering Graduates *ASEE 2024*

C12 **Cruz-Castro**, L., Castelblanco, G., & Antonenko, P. (2024). LLM-based System for Real-Time Technical Writing *Review in Urban Construction and Technology. 60th Associated Schools of Construction Annual International Conference.*

C11 **Cruz Castro, L. M.,** Quintana Cifuentes, J., & Kumar, A. (2023)Preference for debugging strategies and debugging tools and their relationship with course achievement - preliminary results of a study involving novice programmers. *ASEE 2023*

C10 Villanueva Alarcon, I., **Cruz Castro, L. M.,** Mendoza Garcia, J. A., Alvarado, D., Latorre, E., & Virguez, L., (2023) Nuestro Impacto: An insider look into the connections between our past experiences and teaching and mentoring practices. *ASEE 2023.* **Best conference paper award.**

C9 Chen, Y. W., Tenorio, B., **Cruz Castro, L. M.**, Douglas, K. A., Lan, A., & Brinton, C. (2022) Mitigating Biases in Student Performance Prediction via Attention-Based Personalized Federated Learning. *CIKM2022 (ACM International Conference on Information and Knowledge Management)*

C8 **Cruz Castro, L. M.**, Li, T., Ciner, L., Douglas, K. A., & Brinton, C. (2022, June) A Human-Centered Learning Analytics Approach for Predicting Learning Outcome

in a First-Year Engineering Course. *Proceedings of the 2022 ASEE*

C7 Chen, Y. W., Tenorio, B., **Cruz Castro, L. M.**, Douglas, K. A., Lan, A., & Brinton, C. (Accepted for publication Oct. 2021) Click-Based Student Performance Prediction: A Clustering Guided Meta Learning Approach. *Proceedings of the IEEE International Conference on Big Data (IEEE Big Data 2021).*

C6 **Cruz Castro, L. M.**, Ray, S., Merzdorf, H., Douglas, K. A., & Hammond, T. (2021). A Meta Learning Approach to Personalized Automatic Assessment of Rectilinear sketches. *Proceedings of the 51th ASEE/IEEE Frontiers in Education Conference, Lincoln, NE.*

C5 Li, T., **Cruz Castro, L. M.**, & Douglas, K. A. (2021). Relationship between Learning Engagement Metrics and Learning Outcomes in an Online Engineering Course. *Proceedings of the 51th ASEE/IEEE Frontiers in Education Conference, Lincoln, NE.*

C4 **Cruz Castro, L. M.**, & Shoaib, H. (2021). A Systematized Literature Review on Computational Thinking Assessment in STEM Higher Education. *Proceedings of the 128th ASEE Conference and Exposition, Long Beach, CA.*

C3 Diefes-Dux, H. A., & **Cruz Castro, L. M.** (2019). Patterns of Monthly Student Access to Feedback by Section in a Large Course using Standards-Based Grading and Reflection. *Proceedings of the 8th Research in Engineering Education Symposium, Cape Town, South Africa.*

C2 Diefes-Dux, H. A., & **Cruz Castro, L. M.** (2019). Validation of an Instrument to Measure Student Engagement with a Standards-Based Grading System. *Proceedings of the 126th ASEE Conference and Exposition, Tampa, FL.*

C1 Diefes-Dux, H. A., & **Cruz Castro, L. M.** (2018). Student Reflection to Improve Access to Standards-Based Grading Feedback. *Proceedings of the 48th ASEE/IEEE Frontiers in Education Conference, San Jose, CA.* https://doi.org/10.1109/FIE.2018.8659325

Other Publications

OP1 **Cruz Castro, L. M.**, & Ehsan, H. (2020). Surviving the Pandemic as Grad Student Parents. *Inside Higher Ed.*. Retrieved from https://www.insidehighered.com

TEACHING EXPERIENCE

Instructional Assistant Professor Aug 2022 – Present
Department of Engineering Education
University of Florida

- *Designed and Delivered Core Data Science Curriculum*: Developed and taught graduate courses including "Mathematical Foundations of Data Science" and "Introduction to Data Science" for the Master's in Data Science program. The latter is a

project-based course that led to the creation of the Data Science the Novel interactive learning platform to support authentic, narrative-driven learning experiences https://ufdatastudio.com/datasciencethenovel/.

- *Built and Led Python for Engineers (COP2273C)*: Designed the full curriculum and instructional structure for the department's "Python for Engineers" course. Led its evolution into a fully online, hands-on learning environment leveraging modern tools (e.g., notebooks, cloud platforms, and AI-assisted workflows) and created an authentic assessment framework that integrates AI-based supports while evaluating student learning through real-world tasks; piloted and refined these innovations directly in the classroom.
- *Improved Large Undergraduate Computing Courses*: Revised "Programming Fundamentals II (COP3503)," introducing live coding demonstrations and active learning strategies for sections exceeding 600 students, coordinated with approximately 34 teaching assistants each semester. Developed the online version of "Algorithm Abstraction and Design (COP4533)" to expand access and flexibility.
- *Developed Specialized Training and Seminars*: Designed and taught a "Statistical Literacy for Engineering Education Researchers" seminar and co-taught a "Statistics Seminar" for the University of Florida Board of Education Summer Fellowship Program to strengthen quantitative research skills.
- *Guided Design Projects and Mentored Students*: Directed seven senior design projects and was team coach for two groups participating in a industry partnerships to strengthen students' practical engineering skills. Mentored undergraduate, master's, and Ph.D. students, supporting their academic development, research growth, and career trajectories.

Graduate Instructor May 2022 – Aug 2022
ECE20875: Python for Data Science
Elmore Family School of Electrical and Computer Engineering, Purdue University

- *Led Instructional Team and Course Enhancement*: Coordinated the instructional team, integrated active learning activities, and fostered learning communities to enhance student engagement and comprehension.
- *Curriculum Development and Grading Efficiency*: Designed and adapted course materials for seasonal variations and implemented as well as maintained grading scripts to ensure consistent and fair assessments.

Graduate Lead Teaching Assistant Jan 2022 – May 2022
ECE20875: Python for Data Science
Elmore Family School of Electrical and Computer Engineering, Purdue University

- *Leadership in Instructional Strategy*: Led instructional meetings, coordinated assessment efforts, and oversaw instructional design to enhance course effectiveness.
- *Course Delivery and Assessment Design*: Facilitated lectures, managed Github Classroom, and was responsible for the design and review of exams, homework, assignments,

and projects.

Graduate Teaching Assistant Aug 2021 – Dec 2021
ECE20875: Python for Data Science
Elmore Family School of Electrical and Computer Engineering, Purdue University

- *Coordination and Support*: Coordinated grading assignments and office hours among undergraduate and graduate teaching assistants, ensuring effective support across student needs.
- *Inclusive Teaching Practices*: Facilitated equal opportunities for students requiring accommodations during exams and homework, promoting an equitable learning environment.
- *Collaborative Curriculum Development*: Collaborated with team members to develop questions for exams and homework, including the creation of corresponding evaluation rubrics.

Teaching Apprentice Jan 2021 – May 2021
ENE68500: Educational Methods in Engineering
School of Engineering Education, Purdue University

- *Learning Management Oversight*: Administered the course's learning management system to ensure smooth course operations and access.
- *Facilitation of Engagement*: Moderated in-class group discussions to enhance student interaction and deepen understanding of course material.
- *Expert Instruction*: Served as the lead instructor for a lecture focused on student-centered teaching, emphasizing practical application of pedagogical strategies.

MENTORING EXPERIENCE

PhD. Advisor June 2024 - Present
University of Florida - College of Engineering
Maryam Multani

AI Scholar Mentor May 2024 - present
University of Florida - College of Engineering
Cameron Brown, Evelyn Colon

Grad Research Assistant supervisor Oct 2023 - October 2024
University of Florida - College of Engineering
Isabella Victoria

Ph.D. Dissertation Committee Member Aug 2023 - Present
University of Florida - College of Engineering
Dr. Edwin Marte, Dr. Gadhaun Aslam, (in progress) Syed Hassan Tanvir, (in progress)Zhelin Zhang

Glenn and Deborah Renwick Computer Science Fellowship Aug 2022 - Aug 2023
University of Florida - College of Engineering
Akash Kumar

Grad-Track Mentor Aug 2021 – May 2022
Purdue University - College of Engineering

Academic Mentor Aug 2020 - Present
Cientifico Latino - Graduate School Mentorship Initiative

Academic Mentor Aug 2018 – Present
Colombian Student Association at Purdue - Big Sibling Program

SERVICE TO PROFESSION

NSF 2024, 2025, 2026
Reviewer Panelist

ACM - Transaction on Computing Education (TOCE) Jan 2024 – Present
Reviewer

ASEE - Computers in Education Division (COED) Sept 2023 – Present
Delegate to the commission on PreK-12 Engineering Education (CP12)

Journal of Engineering Education (JEE) July 2023 – Present
Reviewer

European Journal of Engineering Education (EJEE) Oct 2022 – Present
Reviewer

IEEE Access Feb 2021 – Present
Reviewer

Computer Applications in Engineering Education (CAE) Mar 2019 – Present
Reviewer

SERVICE TO INSTITUTIONS

Chair Professional Development Committee - Engineering Education (UF)
August 2025 – present

Academic Advisor for SHPE June 2024 – present

Curriculum Committee - AI/DS Master Program (UF) August 2023 – present

Admissions Committee - AI/DS Master Program (UF) August 2023 – present

Grad Affairs Committee - Department of Engineering Education (UF) August 2023 – present

E3 academy - Faculty development (UF) September 2023 – present

Academic Advisor for CS Kickstart (UF) June 2023 – present

Florida Regional Junior Science and Humanities Symposium (UF) January 2023

Engineering Education Bylaws committee (UF) Aug 2022 – present

Colombian Student Association at Purdue (CSAP) (Purdue) Apr 2021 – March 2021

President – Nominated to Student Association of the year at Purdue 2022

Engineering Education Graduate Student Association (Purdue) Aug 2018 - May 2019 Social Justice and Inclusion Chair

Women in Engineering Program (Purdue) Jan 2020
Activity assistant - Introduce a Girl to Engineering day

PROFESSIONAL AFFILIATIONS

Association for Computing Machinery – ACM 2024 – Present
Member

American Society of Engineering Education – ASEE Apr 2021 – Present
Student member

IEEE Eta Kappa Nu – HKN Dec 2020 – Present
Electrical and Computer Engineering Honor Society

Institute of Electrical and Electronics Engineers – IEEE Dec 2020 – Present
Member

Society of Industrial and Applied Mathematics – SIAM Oct 2020 – Present
Member