Alejandro Medina

Waco, TX | 512-412-0965 | alejmedinajr@gmail.com | LinkedIn | GitHub

EDUCATION

Ph.D. in Computer Science
Baylor University, Waco, TX **August 2024 – Present**

- Research Interests: Quality Diversity and Evolutionary Computation; Reinforcement Learning; Generative Models; Machine Learning for Bioinformatics and Behavioral Data; Optimization Algorithms.

Bachelor of Science in Computer Science
Southwestern University, Georgetown, TX **August 2021– May 2024**

- Distinctions: Magna Cum Laude (GPA 3.88), Paideia Scholar, Dean's List (August 2021– May2024)
- Minors: Mathematics and Data Science
- Honors: Pi Mu Epsilon (President), Upsilon Pi Epsilon (Vice President), Omicron Delta Kappa
- Organizations: Computer Science Club, Latinos Unidos (Event Coordinator), Honor Code Council (Vice President), LatinXcel, Mathematics Club, University Committee on Discipline

PUBLICATIONS

- **A. Medina**, M. Richey, M. Mueller, and J. Schrum, "Evolving Flying Machines in Minecraft Using Quality Diversity", In Proceedings of the Genetic and Evolutionary Computation Conference (GECCO '23). Association for Computing Machinery, New York, NY, USA, 1418–1426.

- B. Anthony, **A. Medina**, and M. Mueller, "Prioritizing Self, Team, or Job: Trends in Sincerity in Cooperative Polls", 19th International Conference on Cooperative Design, Visualization, and Engineering (CDVE 2022). LNCS, Vol. 13492, Springer, pp. 34-44, September 2022.

SELECTED RESEARCH PROJECTS

Quality Diversity Exploration of DNA Motif Discovery | *MAP-Elites, Bioinformatics, Evolutionary Computation [2026]*

- Framed DNA motif discovery as a quality diversity problem, enabling recovery of multiple high-quality motif hypotheses rather than a single consensus motif.
- Designed behavioral characterizations capturing motif specificity, coverage, and compositional structure.
- Conducted comparative evaluation against MEME under matched likelihood-based criteria.
- Preliminary results released as an arXiv preprint (companion paper under review)

Alcohol Consumption Phenotyping in Rhesus Macaques (MATRR) | *Machine Learning, Bioinformatics [2025]*

- Reassessed alcohol-intake trajectory classifications using multiple ML models.
- Challenged stability and predictive validity of categories reported in foundational MATRR studies.
- Presented results at the 2025 AI for Biology & Medicine Symposium.

Quality Diversity for Creative AI in Minecraft | *Evolutionary Computation, QD, Generative Systems [2023]*

- Developed MAP-Elites based algorithms for generating flying machines in Minecraft.
- Designed custom behavior descriptors and binning schemes.
- Results published in Proceedings of the Genetic and Evolutionary Computation Conference (GECCO '23)
- Results presented in poster competitions earning 3rd place and Honorable Mention awards.

Algorithmic Scheduling and Dial-a-Ride Optimization | *Algorithms, Scheduling, Optimization [2023]*

- Investigated single-vehicle Dial-a-Ride problems with deadline constraints
- Implemented and evaluated an earliest deadline first (EDF) algorithm against alternative scheduling strategies.

- Presented results at the 2023 CMD-IT/ACM Richard Tapia Celebration of Diversity in Computing Conference.

RESEARCH APPOINTMENTS

Graduate Research Assistant | **Baylor University**, Waco, TX **May 2025 – Present**

Advisor: Dr. Mary Lauren Benton
- Quality Diversity Approaches to DNA Motif Discovery [2026]
- Alcohol Consumption Phenotyping & Behavioral Modeling in Nonhuman [2025]

Undergraduate Research Assistant | **Southwestern University**, Georgetown, TX **January 2022 – August 2023**

Advisor: Dr. Barbara Anthony
- Algorithm Design & Scheduling [2023]
- Approval Voting Theory & Cooperative Polls [2022]

Advisor: Dr. Jacob Schrum
- Quality Diversity & Creative AI [2023]

PRESENTATIONS

- "Revisiting Predictive Models of Alcohol Consumption in Nonhuman Primates." Presented at the 2025 AI for Biology & Medicine Symposium in Denton, TX, October 30th, 2025.

- "SNITCH: Southwestern's Newest Innovation to Cultivate Honor." Presented at the South Central Regional Meeting of the Consortium of Computing Sciences in Colleges in Nacogdoches, TX, April 5th, 2024. **(3rd Place: Undergraduate Poster Competition)**

- "Evaluating an Earliest Deadline First Algorithm for a Dial-a-Ride Problem." Presented at the 2023 CMD-IT/ACM Richard Tapia Celebration of Diversity in Computing Conference in Dallas, TX, September 16th, 2023.

- "Using Quality Diversity to Evolve Flying Machines in Minecraft." Presented at the South Central Regional Meeting of the Consortium of Computing Sciences in Colleges in Nacogdoches, TX, March 31st, 2023. **(3rd Place: Undergraduate Poster Competition)**

- "Interactive Evolution of Novel Shapes in Minecraft." Presented at the South Central Regional Meeting of the Consortium of Computing Sciences in Colleges in Nacogdoches, TX, March 31st, 2023. **(Honorable Mention: Undergraduate Poster Competition)**

- "Prioritizing Self, Team, or Job: Trends in Sincerity in Cooperative Polls." Presented at 19th International Conference on Cooperative Design, Visualization and Engineering virtually in September 2022.

RESEARCH AWARDS/HONORS

Computing Research Association's Outstanding Undergraduate Researcher Award **(2024)**
- National award that recognizes up to four undergraduate students in North American colleges and universities who show outstanding potential in an area of computing research.

CCSC Undergraduate Poster Competition 3rd Place (2023, 2024)
- *SNITCH: Southwestern's Newest Innovation to Cultivate Honor*. [2024]
- *Using Quality Diversity to Evolve Flying Machines in Minecraft*. [2023]

CCSC Undergraduate Poster Competition Honorable Mention (March 2023)

- *Interactive Evolution of Novel Shapes in Minecraft*.

OTHER AWARDS/HONORS

Judge for Research & Internship Day Undergraduate Poster Competition *(2025)*
- Selected to judge research poster competition for Baylor University's Research & Internship Day.

Five Points of Pirate Pride Award *(2024)*
- Award for most exemplary graduating student across all of Natural Sciences.

Grogan Lord Award in Computer Science (March 2024)
- Award for most exemplary graduating student within the Computer Science department.

Designated Matriculation Speaker (2023)
- Selected to give matriculation speech to the incoming freshman class of 2027 at Southwestern University.

2023 Hispanic Scholarship Fund (HSF) Scholar (2023)
- Designated Hispanic scholar from a highly competitive pool of over 124,400 applicants.

Jack Frost Citizen of the Month (2021)
- Recognized for my actions and leadership within my community.

WORK EXPERIENCE

Graduate TA | **Baylor University**, Waco, TX **August 2024 – Present**
- Mentored first-year students in a small cohort on research projects.
- Prepared and delivered material for 2-hour weekly sessions.
- Assisted students with Python coding for voter theory techniques.

Undergraduate Research Mentor | **Southwestern University**, Georgetown, TX **January 2024 – May 2024**
- Mentored first-year students in a small cohort on research projects.
- Prepared and delivered material for 2-hour weekly sessions.
- Assisted students with Python coding for voter theory techniques.

Business Intelligence and Data Analytics Intern | **Hy Cite Enterprises**, Madison, WI **June 2023 – August 2023**
- Applied machine learning algorithms for predictive modeling, anomaly detection, and clustering using Python and Microsoft Power BI. Presented findings to company audiences to support financial decision-making based on data trends.
- Researched and implemented optimization and performance techniques for the company's data warehouse by analyzing query execution plans and identifying bottlenecks.
- Automated agile reporting processes using Python and Snowflake.

Computer Science Tutor | **Southwestern University**, Georgetown, TX **January 2023 – May 2023**
- Tutored students in Computer Science I and II, helping them with projects and assignments.
- Provided additional assistance outside of regular tutoring hours.
- Prepared students of varying levels for academic success in computer science courses.

SKILLS & INTERESTS

Technical: Java, Python, C++, C, R, Lisp, Haskell, Prolog, SQL, Snowflake, PHP, HTML, JSON, JavaScript, NASM x86 Assembly, Git, CSS, LaTeX, Flutter, Android Studio, React, Matplotlib, Docker

Non-Technical: Public speaking, presentation skills, technical writing, team leadership, mentorship, experimental design, statistical analysis, troubleshooting, collaboration, networking, empathy, innovative thinking, creative problem-solving

Relevant Coursework: Advanced Algorithms, Advanced Computational Biology, Theory of Computation, Machine Learning, Data Analytics, Artificial Intelligence, Advanced Database, Advanced Data Communications, Introduction to Data Mining, Advanced Software Engineering, Linear Algebra, Discrete Mathematics, Graph Theory

Professional Associations: ACM, IEEE, SACNAS, SHPE, LatinX in AI (LXAI), Computing Research Association (CRA), ALPFA

Languages: Spanish (Fluent), English (Fluent)

Musical instruments: Violin

Sports: Soccer, Track & Field