Alejandro Medina

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EDUCATION

Bachelor of Science in Computer Science expected May 2024
Southwestern University, Georgetown, TX

- GPA 3.88, Paideia with Distinction
- Minors in Mathematics and Data Science
- Member: Computer Science Club, Hispanics and Latinx Organization (Event Coordinator), Honor Code Council (Vice President), LatinXcel, Mathematics Club, Omicron Delta Kappa, Pi Mu Epsilon (President), University Committee on Discipline, Upsilon Pi Epsilon (Vice President)

LEADERSHIP ACTIVITIES

Hispanics and Latinx Organization – **Southwestern University**, Georgetown, TX **September 2023 – Present**

- Plan and oversee organization events and meetings
- Serve as a positive role model to younger students
- Promote member growth
- Informally mentor incoming students
- Event Coordinator (2023 – Present)

Honor Code Council – **Southwestern University**, Georgetown, TX **August 2022 – Present**

- Conduct Honor Code presentation to incoming first year students
- Serve on Honor Code Council Hearings for alleged violations
- Promote member growth of the Honor Code Council
- Vice President (2023 – Present), Education Committee Chair (2022)
- Designated as the Fall 2023 Matriculation speaker representative for the Honor Code Council

The Locker Club, Georgetown, TX **August 2020 – Present**

- Help supply kids in need throughout the community
- Run multiple community fundraisers in a leadership position
- President (2020), Trustee (2021 – Present)

WORK EXPERIENCE

Business Intelligence and Data Analytics Intern | **Hy Cite Enterprises**, Madison, WI **June 2023 – August 2023**

- Applied Machine Learning algorithms and techniques to explore predictive modeling, anomaly detection, and clustering using Python and Microsoft Power BI. The findings were presented to several company audiences to assist the company in making better financial decisions based on previous data trends that have been observed in the past.
- Collaborated on automating the agile report process using Python and Snowflake.
- Utilized DBT and Snowflake to research optimization and performance techniques for the company's data warehouse by analyzing query execution plans, identifying potential bottlenecks, and proposing optimization plans.

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

- Collaborated on research related to algorithmic design and evaluation with Dr. Barbara Anthony
- Dial-a-Ride problems (DARP) are used to help find ways for scheduling vehicle routes to pick up an object or individual and transport them to another location. This research focuses on a DARP variant where the goal is to

maximize the number of rides provided by their deadline using a singular vehicle. The specific algorithm investigated was an Earliest Deadline First (EDF) algorithm.
- Used Python to implement various algorithms for the purpose of measuring and comparing the efficiency and accuracy of various approaches.
- "Evaluating an Earliest Deadline First Algorithm for a Dial-a-Ride Problem" [Poster] presented at the Richard Tapia 2023 Conference.

Computer Science Tutor | **Southwestern University**, Georgetown, TX **January 2023 – May 2023**
- Prepared computer science students of different levels for projects and assignments
- Offered times outside of tutoring hours to assist students who could not meet normal tutoring hours
- Courses tutored include Computer Science I, and Computer Science II

SCOPE Undergraduate Research | **Southwestern University**, Georgetown, TX **May 2022 – July 2022**
- Collaborated on research in the field of Artificial Intelligence, working closely with Dr. Jacob Schrum and two other students.
- Minecraft is a game that allows players to express themselves creatively. I worked on creating, applying, and testing quality diversity algorithms to create artificial intelligence capable of generating flying machines in the simulated world. Flying machines are structures that are difficult for many humans to make.
- Main responsibilities included coming up with new binning schemes and implementing them, creating the main shape generator used in the experiment, creating batch files that could be used to automate the experiment performed with different experiment parameter configurations.
- Co-authored "Evolving Flying Machines in Minecraft Using Quality Diversity"

Undergraduate Research Assistant | **Southwestern University**, Georgetown, TX**January 2022 – May 2022**
- Collaborated research in the field of Approval Voting Theory, working closely with Dr. Barbara Anthony and one other student.
- Approval voting assumes voters are sincere. This research investigates the trends in cooperative polls, specifically Doodle Polls, to determine how sincere users are when scheduling meetings.
- Used NumPy and Pandas to process results from human subjects study
- Co-authored "Prioritizing Self, Team, or Job: Trends in Sincerity in Cooperative Polls"
- Presented research results at International Conference on Cooperative Design, Visualization, and Engineering

Computer Programmer Intern | **APIMasters Technologies**, Cedar Park, TX **Summer 2021**
- Worked and trained with professional software engineers in areas related to software development, testing, and communicating with clients
- Tested applications being developed for clients and presented errors or new ideas in meetings
- Created small applications and/or websites for clients

PUBLICATIONS

- **A. Medina**, B. Anthony, "Evaluating an Earliest Deadline First Algorithm for a Dial-a-Ride Problem" [Poster], 2023 CMD-IT/ACM Richard Tapia Celebration of Diversity in Computing Conference, *Forthcoming in September 2023*.

- **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.

PRESENTATIONS

Conference Research Presentations

- "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 31, 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 31, 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.

University Presentations | **Southwestern University**, Georgetown, TX

- "Evolving Flying Machines in Minecraft Using Quality Diversity." Presented at Southwestern University's Research & Creative Works Symposium on April 14, 2023.
- "An Algorithmic Approach to Nicotine Addiction." Presented at Southwestern University's Research & Creative Works Symposium on April 14, 2023.
- "Evolving Flying Machines in Minecraft Using Quality Diversity." Presented at Southwestern University's Math/Computer Science Departments' 40X Lecture on April 4, 2023.
- "An Algorithmic Approach to Nicotine Addiction." Presented at Southwestern University's King Creativity Symposium on March 8, 2023.
- "Cooperative Polls & Flying Machines." Presented at Southwestern University's President's Appreciation Celebration on October 14, 2022.
- "Prioritizing Self, Team, or Job: Trends in Sincerity in Cooperative Polls." Presented at Southwestern University's Math/Computer Science Departments' 40X Lecture on September 9, 2022.
- "Using Quality Diversity to Generate Flying Machines in Minecraft." Presented at Southwestern University's High Impact Experiences Celebration on September 8, 2022.
- "Interactive Evolution of Novel Shapes in Minecraft." Presented at Southwestern University's High Impact Experiences Celebration on September 8, 2022.
- "Prioritizing Self, Team, or Job: Trends in Sincerity in Cooperative Polls." Presented at Southwestern University's Research & Creative Works Symposium on April 12, 2022.

PROFESSIONAL DEVELOPMENT

CMD-It/ACM Richard Tapia Celebration of Diversity, Dallas, Texas, September 14th-16th, 2023.

- The CMD-IT/ACM Richard Tapia Celebration of Diversity in Computing Conference is a significant event aimed at acknowledging and promoting diversity within the computing field. It brings together a wide range of participants, including students, faculty, researchers, and professionals from diverse backgrounds, to celebrate diversity, create communities, and engage with leaders in academia, industry, and government. The conference focuses on current technical topics, professional development, networking, and research presentations, while also offering scholarships and a career fair to support diversity in computing.
- One of 28 undergraduate and graduate student presenters selected to present original research.
- Recipient of scholarship to attend conference fully funded**.**

Capital One HSI Immersion Program, Plano, Texas, July 24th-27th, 2023.

- The Capital One HIS Immersion Program offers selected students an opportunity to embark on an extensive and immersive personal, professional, and technical development journey under the leadership of Capital One mentors.
- One of 50 undergraduate students selected via application and interview to participate.
- The final capstone project consisted of collaborating in a small team to create an early model of an native react application aimed at teaching users better financial literacy**.**

New Horizons in Theoretical Computer Science, Virtual Event, June 12th-16th, 2023.

- New horizons in theoretical computer science are a week-long online summer school in which undergraduates are exposed to advanced research areas in theoretical computer science and its applications.
- One of 40 undergraduate students selected via application to participate.
- Attended workshops and mini-courses related to research areas in theoretical computer science, graduate school, networking, community building, and other career/personal development areas.

Hispanic Association of Colleges and Universities (HACU) 36th Annual ¡Adelante! Leadership Institute, San Diego, CA, October 8th-10th, 2022.

- Sponsored by Southwestern University to represent the university as a top Latino Leader (only 5 students selected).
- Attended workshops related to networking, public speaking, leadership training, community building, and other career/personal development areas.

AWARDS & HONORS

Omicron Delta Kappa (Fall 2023)

- Omicron Delta Kappa is a national honor society for students in the top third of their class, where membership is selected based on leadership in one of the following areas: scholarship, athletics, or community service.

Designated Matriculation Speaker (Fall 2023)

- I was selected to give a speech to the incoming freshman class of 2027 at Southwestern University.

2023 Hispanic Scholarship Fund (HSF) Scholar (Spring 2023)

- The Hispanic Scholarship Fund (HSF) has yearly scholars that are selected from a highly competitive pool of over 124,400 applicants.

CCSC Undergraduate Poster Competition 3rd Place (Spring 2023)

- 3rd Place Award for the Consortium for Computing Sciences in Colleges (CCSC) South Central Region Undergraduate Poster Competition for *Using Quality Diversity to Evolve Flying Machines in Minecraft*.

CCSC Undergraduate Poster Competition Honorable Mention (Spring 2023)

- Honorable Mention Award for the Consortium for Computing Sciences in Colleges (CCSC) South Central Region Undergraduate Poster Competition for *Interactive Evolution of Novel Shapes in Minecraft*.

Upsilon Pi Epsilon (Spring 2023)

- Upsilon Pi Epsilon is a national Computer Science honors society for outstanding students who have a grade point average of at least 3.5 and rank in the upper third of all students in their university's Computer Science program.

Pi Mu Epsilon (Spring 2023)

- Pi Mu Epsilon is a national Mathematics honors society for outstanding students who have completed their mathematical work with honor (at least A- average), and who are in the top one-third of their class in their general college work.

King Creativity Scholar (Spring 2023)

- King Creativity Scholars are Southwestern University undergraduate students who have been accepted to receive funding for student-designed research projects.

SCOPE Research Scholar (Summer 2022)

- SCOPE Research Scholars are Southwestern University undergraduate students who have been accepted to perform research with faculty on faculty-designed research projects.

Dean's List (Fall 2021, Spring 2022, Fall 2022, Spring 2023)

- Students named to this list are recognized for their academic achievements and excellence.

Jack Frost Citizen of the Month (May 2021)

- The Jack Frost Citizen of the Month Award is given to high school seniors who exemplify excellence in academics, extracurricular, and volunteering.

SKILLS & INTERESTS

Technical: Java, Python, C++, C, R, Lisp, Haskell, Prolog, SQL, Snowflake, PHP, HTML, JSON, JavaScript, Git, NASM x86 Assembly, Git, CSS, LaTeX, Flutter, Anroid Studio, React
Languages: Spanish (Fluent), English (Fluent)
Musical instruments: violin
Sports: soccer, track & field