

Maddie Juarez

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Education

Loyola University Chicago, BS in Computer Science

August 2022 – May 2026

- GPA: 3.98/4.0

- **Awards:** NSF REU, Mulcahy Scholarship, Research Mentoring Fellow, SBP-BRiMS Conference Scholarship

- **Research Interests:** Machine Learning, Natural Language Processing, Human-Computer Interaction, Social Computing, Graph-Based Modeling, AI for Social Good, Robotics, Simulation, Renewable Energy

Experience

Argonne National Laboratory – Lemont, IL

Undergraduate Visiting Student Researcher - Leadership Computing Facility

June 2023 - Aug 2023

- Researched machine learning algorithms and deep learning models, including CNN, RNN, and HAN to develop and analyze cyberbullying detection systems leveraging large-language models.
- Applied Natural Language Processing (NLP) classification techniques such as word2vec, LIWC, and TF-IDF, and implemented models such as Naive Bayesian, Random Forest, and GPT to social media datasets, enhancing cyberbullying detection accuracy using state-of-the-art techniques.
- Worked alongside a diverse team of students and researchers in computer science and data visualization, supporting super-computing applications for imbalanced and small-scale datasets.

Science Undergraduate Laboratory Internship (SULI) - Center for Transportation

June 2024 - Aug 2024

Research

- Developed and deployed custom V2X software for real-time transmission and reception between connected vehicles and roadside units, supporting smart mobility infrastructure and EcoCAR's electric vehicle platform.
- Simulated dynamic driving scenarios using bench-tested radios to enable pre-road testing validation for connected and automated vehicle (CAV) pipelines.
- Built scalable on-road CAV data collection mechanisms to validate energy-efficient, intelligent vehicle behaviors aligned with next-generation mobility and renewable energy initiatives.
- Focused on electric vehicle integration as part of the U.S. Department of Energy's mission to advance sustainable transportation and renewable energy systems.
- Contributed to the DOE-sponsored STEP program, advancing applied research and STEM workforce development in transportation electrification and V2X innovation.

Publications

Conference Papers

1. **Maddie Juarez**, Natali Barragan, Deborah Hall, Yasin Silva, George Thiruvathukal. *ActionPoint: An App to Combat Cyberbullying by Strengthening Parent-Teen Relationships*. The 2024 World Forum on Public Safety Technology (WF-PST). 10.1109/WFPST58552.2024.00008
2. **Maddie Juarez**, Eldor Abdukhamidov, Manuel Sandoval, Mujtaba Nazari, Deborah Hall, George Thiruvathukal, Tamer Abuhmed, Yasin Silva, Mohammed Abuhamad. *Analyzing Adversarial Strategies and Countermeasures for Cyberbullying Detection*. The 2025 Conference on Social Computing, Behavioral-Cultural Modeling & Prediction and Behavior Representation in Modeling and Simulation (SBP-BRiMS).
3. Manuel Sandoval, Muhammad Arslan, **Maddie Juarez**, Satyaki Sikdar, Mohammed Abuhamad, Daniel Moreira, Deborah L. Hall, Yasin N. Silva. *Insta-CTSR: Cyberbullying, Topics, Severity and Roles for Instagram*. Under Submission.

4. Satyaki Sikdar, Manuel Sandoval, Taylor Hales, Chloe Kilroy, **Maddie Juarez**, Tyler Rosario, Juan J. Rosendo, Deborah L. Hall, Yasin N. Silva. *Network Analysis of Cyberbullying Interactions on Instagram.* Under Submission.

Posters

1. Abha Rai, Alix Sanchez Gomez, Elisa Levya Cea, Mary Held, Maria Vidal de Haymes, Shakila Fro, George K. Thiruvathukal, **Maddie Juarez**, Farzana Farzam, Ali Tarokh, Paula Tallman. *Centering Voices: Culturally Responsive Support for Central and South Asian Newcomers using AI and Fitness Trackers.* The 2026 Conference on Society for Social Work and Research (SSWR).

Research Projects

BullyBlocker, Anti-Bullying Project

May 2022 – Present

- Created an iOS app, *ActionPoint*, aimed at reducing cyberbullying by enhancing parent-teen communication; included interactive in-app surveys with real-time feedback to foster awareness and dialogue.
- Developed machine learning pipelines to evaluate the robustness of cyberbullying detection models on social media data by introducing adversarial attacks and analyzing model vulnerabilities.
- Constructed a labeled dataset capturing fine-grained cyberbullying roles (e.g., bully, defender, bystander), topical content, and severity levels, supporting high-resolution classification and fairness evaluation.
- Modeled evolving cyberbullying sessions as dynamic directed graphs, capturing user roles and interactions to analyze temporal structure and influence propagation in online abuse networks.
- Tools Used: Swift, XCode, Python, SQL, AWS, PHP, GitHub, PyTorch, HuggingFace

Dost: Culturally Responsive Support for Central and South Asian Newcomers Using AI

June 2024 - Dec 2024

- Built an interactive web-based platform for Afghan refugees to access support resources aimed to reduce stress and enhance integration, including a fine-tuned GPT model offering real-time support.
- Tools Used: HTML, Open AI API, Javascript, Python

Visuomotor Behavior Cloning with Human Action Reconstruction

Oct 2024 - Present

- Develop large-scale, self-supervised learning systems that enable robots to learn directly from human demonstration in combination with robot actions simultaneously, aiming to overcome embodiment challenges to perform complex tasks in real-world environments.
- Designed and executed structured data collection pipelines for both human video demonstrations and vision-based robot teleoperation, enabling robust training across four manipulation tasks (Pick, Stack, Sort Duck, Sweep) using the XArm robotic platform.
- Conducted joint training using visual and proprioceptive input modalities, applying retargeted 3D hand pose estimation and action mapping techniques to enable robust, sample-efficient robot policies.
- Tools Used: Python, PyTorch, XArm Robot, Diffusion Policy, LeRobot, HaMer, ResNet18, GELLO, RealSense D435, Mujoco, HuggingFace

Heyfriend: Wellness and Resource-Driven Support for Low-Income Chicagoans

July 2025 - Present

- Built an interactive web-based platform for low-income individuals to access support resources aimed to reduce stress and enhance integration, including a fine-tuned GPT model offering real-time support.
- Built a custom resume-rendering tool using rendercv and HTML interface to allow users to create a customized, downloadable, formatted résumé.
- Integrated real-time logging using javascript to record aggregated user interactions among site
- Tools Used: HTML, Open AI API, Javascript, Python

Technologies

Languages: Python, Java, C++, C, Java, C#, SQL, JavaScript, Swift, R, SAS, HTML/CSS, PHP

Technologies: Microsoft SQL Server, XCode, Linux, LaTeX, AWS, GitHub, Jupyter, Django