

Maddie Juarez

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Education

University of Chicago <i>PhD Computer Science</i>	September 2026 – June 2032
Advised by <i>Prof. Blase Ur</i>	
Loyola University Chicago <i>BS Computer Science</i>	August 2022 – May 2026
GPA: 3.98/4.0	
Advised by <i>Prof. Yasin N Silva, Prof. George K. Thiruvathukal, Prof. Mohammed Abuhamad</i>	

Awards and Honors

NSF GRFP	\$159,000	2026-2031
DOE CSGF	\$180,000	2026-2030
Loyola Distinguished Undergraduate Achievement Award	-	2026
Loyola Distinguished Undergraduate Computing Research Award	-	2026
Loyola Outstanding Undergraduate Researcher Award	\$500	2026
CRA Outstanding Undergraduate Researcher Honorable Mention	-	2026
SBP BRiMS Conference Attendance Scholarship	\$1,000	2025
Loyola Mulcahy Research Scholarship	\$2,000	2024-2025
Loyola Research Mentoring Fellow	\$2,000	2024

Research Experience

BullyBlocker Laboratory

iOS App to Combat Cyberbullying May 2022 – August 2023

- 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.
- Used AWS and PHP to implement secure user authentication and support server-side architecture.
- Published and presented work at WF-PST'24 in Washington, DC; Presented at Speak Up, Stand Up, Save a Life event in Phoenix, AZ.

Analyzing the Robustness of Machine Learning Models for Cyberbullying Detection using Adversarial Attacks August 2023 – May 2025

- Designed and implemented end-to-end machine learning pipelines to evaluate cyberbullying detection models, incorporating text standardization, cross-validation, and baseline benchmarking across traditional ML and deep learning models.
- Conducted black-box adversarial attacks using word-level substitutions and character-level perturbations to assess model vulnerabilities and quantify performance degradation.
- Analyzed limitations of small expert-labeled datasets and restricted metadata access, synthesizing findings to highlight challenges in real-world cyberbullying detection.

Cyberbullying Dataset and Graphical Networks May 2025 – Present

- Constructed a labeled dataset capturing fine-grained cyberbullying roles between victims and bullies, topic 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.

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.

Science Undergraduate Laboratory Internship (SULI) - Center for Transportation Research

June 2024 - Aug 2024

- 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.

Software and Systems Laboratory

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.

AI for Social Good Projects

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.

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 resumé.
- Integrated real-time logging using javascript to record aggregated user interactions among site

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. Abha Rai, Maria Vidal de Haymes, Ali Tarokh, Shakila Fro, Farzana Farzam, Elisa Leyva Cea, Alix Sanchez-Gomez, **Maddie Juarez**, George Thiruvathukal, Paula Tallman. *AER for Stronger Communities: A Culturally Responsive Intervention for Newcomers*. Families in Society: The Journal of Contemporary Social Services 2026.

4. 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.*
5. 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.*
6. **Maddie Juarez**, Abha Rai, Kristen E. Ravi, Margaret C. Delaney, Danny Olweean, Eric Klingensmith, Swarnali Banerjee, Neil Klingensmith, George K. Thiruvathukal. *HeyFriend Helper: A Conversational AI Web-App for Resource Access Among Low-Income Chicago Residents. Under Submission.*