Allen Chang

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Education

2020 – Present ***University of Southern California*** (***GPA 3.955 / 4.0***)
B.S. in Computer Science
B.S. in Applied and Computational Mathematics
Advisors: Maja Matarić, Jesse Thomason, Stefanos Nikolaidis

Research Experience

2023 ***Carnegie Mellon University***
Summer 2023 Robotics Institute Scholar
Advisor: Jean Oh

2022 ***Massachusetts Institute of Technology Haystack Observatory***
Summer 2022 REU Intern
Advisor: Mary Knapp
Contributions: *I proposed and developed a framework to remove radio frequency interference from astronomy data collected at the South Pole Station with CNNs, improving the data quality of signals that inform our understanding of wave-particle interactions in astrophysical plasmas, resulting in a first-author paper accepted at ICASSP 2023.*

2021 ***Tsinghua University***
Summer 2021 REU Intern
Advisor: Shaoxu Song
Contributions: *I developed autoregressive attention-based models to enhance how users access and use data from tabular databases with ordered data. I performed replication experiments to corroborate the results from related studies and tested on additional tabular benchmarks, ultimately informing the architecture design for our method.*

2020 - Present ***University of Soutehern California Interaction Lab, GLAMOR Lab, ICAROS Lab***

Undergraduate Researcher

Advisors: Maja Matarić, Jesse Thomason, Stefanos Nikolaidis

Project 1 Contributions **(*Advisor: Maja Matarić*):** *I preprocessed data from 25 infant-robot interactions, developed, trained, and evaluated a multimodal infant affect recognition models, supporting the ability for robots to modulate actions to an infant's needs during therapy, resulting in a co-first author paper I presented at ACII 2022 (Long Oral) and also the 2022 SoCalRobotics Symposium.*

Project 2 Contributions **(*Advisor: Jesse Thomason*):** *I led a 4-person undergraduate team to study how visual signals can facilitate speech recognition for language-guided embodied agents, demonstrating the utility of using visual environment cues to improve spoken instruction understanding in 36 noisy household task-completion settings, and presented a first-author paper based on this work at INTERSPEECH 2023.*

Project 3 Contributions **(*Advisors: Maja Matarić, Stefanos Nikolaidis*):** *I formulated synthetic data generation as a quality-diversity problem and utilized differential quality diversity algorithms to maximize skin-tone diversity to balance undersampled minority populations in common facial benchmarks, including CelebA, FFHQ, and IJB-C. Data augmentation is shown to facilitate training of a model to be more accurate and fair. I am currently preparing this work for submission at ICLR 2024.*

Fellowships, Awards, & Honors

2023 **CMU Robotics Institute, Summer Scholar Fellowship**

2023 **Barry M. Goldwater Foundation, Barry M. Goldwater Scholarship**
Premier undergraduate scholarship for undergraduates pursuing research careers in STEM.

2022 **USC Office of the Provost, Provost's Undergraduate Research Fellowship**
(awarded, funding declined due to concurrent scholarship)
Research funding for an academic semester.

2022 **USC Viterbi School of Engineering, CURVE Research Fellowship**
Research funding for an academic year.

2021 **MIT Haystack Observatory, Summer Research Fellowship**

2022 **Tau Beta Pi Honors Society**

2021 **Tsinghua University, Summer Research Fellowship**

2021 **USC Viterbi School of Engineering, W.V.T. Rusch Engineering Honors Program**

2021 **USC, Academic Achievement Award Scholarship**

2021 **Phi Kappa Phi Honors Society**

2020 **USC Mathematics Department, CIMES Engineering Mathematics Prize**
One of four recipients. Awarded for Calculus III.

Publications

INTERSPEECH 2023 **Multimodal Speech Recognition for Language-Guided Embodied Agents**
Allen Chang, Xiaoyuan Zhu, Aarav Monga, Seoho Ahn, Tejas Srinivasan, Jesse Thomason
International Speech Communication Association Interspeech (*INTERSPEECH 2023*).

ICASSP 2023 **Removing Radio Frequency Interference from Auroral Kilometric Radiation with Stacked Autoencoders**
Allen Chang, Mary Knapp, James LaBelle, John Swoboda, Ryan Volz, Philip J. Erickson
IEEE International Conference on Acoustics, Speech, and Signal Processing (*ICASSP 2023*).

ACII 2022 **Evaluating Temporal Patterns in Applied Infant Affect Recognition**
Allen Chang *, Lauren Klein *, Marcelo R. Rosales, Weiyang Deng, Beth A. Smith, Maja J. Matarić
International Conference on Affective Computing and Intelligent Interaction (*ACII 2022*). [Long Oral]

* Equal contribution.

Teaching

Spring 2021 **Undergraduate Teaching Assistant: Discrete Mathematics (CSCI 170)**
University of Southern California

Outreach and Service

2021 – Present **USC Center for AI in Society's Student Branch**
Advisor (Summer 2023 - Present)
Co-President (Fall 2022 - Spring 2023)
Vice President of Operations (Fall 2021 - Summer 2022)
Project Lead (Fall 2022 - Spring 2023)
Curriculum Lead (Fall 2021 - Fall 2022)

2020 - 2022 **USC Association for Computing Machinery**
Advisor (Fall 2021 - Spring 2022)
Operations Chair (Spring 2021)
Events Chair (Fall 2020)

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