

Allen Chang

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EDUCATION

University of Southern California - GPA 3.955 / 4.0, Los Angeles, CA

August 2020 - Present

Bachelor of Science in Computer Science

Bachelor of Science in Applied and Computational Mathematics

RESEARCH EXPERIENCE

University of Southern California

September 2020 - Present

Undergraduate Researcher @ the Interaction Lab, GLAMOR Lab, ICAROS Lab | Los Angeles, CA

- Project 4 Advisors: **Prof. Maja Matarić**, **Prof. Jesse Thomason**
- Exploring the use of social frames in social LLM agent interactions.
- Project 3 Advisors: **Prof. Maja Matarić**, **Prof. Stefanos Nikolaidis**
- Reduced algorithmic bias in facial recognition classifiers using quality-diversity (QD), a type of evolutionary optimization. I parameterized QD using language prompts to sample balanced data from generative models and repaired biases in classifiers. I presented a first-authored paper based on this work @ AAAI 2024.
- Project 2 Advisor: **Prof. Jesse Thomason**
- Led a 4-person undergraduate team to study spoken language grounding in vision for language-guided embodied agents. I demonstrated that visual signals improved spoken instruction recognition in 36 noisy household task-completion settings and improved an embodied agent's task success rate, and presented a first-authored paper based on this work @ INTERSPEECH 2023 (Oral).
- Project 1 Advisor: **Prof. Maja Matarić**
- Developed multimodal infant emotion recognition models trained from 25 infant-robot interactions, for affect-aware therapeutic robots, resulting in a co-first authored paper I presented @ ACII 2022 (Long Oral).

Carnegie Mellon University

June 2023 - August 2023

Robotics Institute Summer Scholar @ The Robotics Institute, Carnegie Mellon University | Pittsburgh, PA

- Advisor: **Prof. Jean Oh**
- Led a pilot user study based on conditional drawing synthesis with Stable Diffusion to study socially assistive human-AI interactions in co-drawing with a UFactory Lite 6 robotic arm.

Massachusetts Institute of Technology

May 2022 - August 2022

Research Fellow @ MIT Haystack Observatory, Massachusetts Institute of Technology | Westford, MA

- Advisors: **Dr. Mary Knapp**, **Prof. James LaBelle**
- 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 to aid science analysis of wave-particle interactions in plasmas, resulting in a first-authored paper @ ICASSP 2023.

Tsinghua University

May 2021 - August 2021

Research Fellow @ School of Software, Tsinghua University | Beijing, China

- Advisor: **Prof. Shaoxu Song**
- Trained transformer architectures on masked-recovery tasks for improved representations of large databases.

PUBLICATIONS

Quality-Diversity Generative Sampling for Learning with Synthetic Data [\[link\]](#)

2024

Allen Chang, Matthew C. Fontaine, Serena Booth, Maja J. Matarić, Stefanos Nikolaidis
AAAI Conference on Artificial Intelligence (AAAI 2024)

Multimodal Speech Recognition for Language-Guided Embodied Agents [\[link\]](#)

2023

Allen Chang, Xiaoyuan Zhu, Aarav Monga, Seoho Ahn, Tejas Srinivasan, Jesse Thomason
INTERSPEECH 2023 [Oral]

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

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

* Equal contribution

SELECTED FELLOWSHIPS, AWARDS, & HONORS

NSF Graduate Research Fellowship (GRFP) 2024
 2037 recipients / 16000 (**Top 13%**). Offers three years of PhD funding.

USC Global Scholars Distinction + Prize Competition Finalist 2024

Barry M. Goldwater Scholarship 2023
 413 recipients / 5000 (**Top 10%**). Premier research scholarship for UGs pursuing research careers in STEM.

USC Provost's Undergrad Research Fellowship 2022
 Research funding for an academic semester. Awarded, funding declined due to another concurrent fellowship.

USC Viterbi School of Engineering CURVE Research Fellow 2022
 Research funding for an academic year.

Elected to Tau Beta Pi Honor Society 2022

W.V.T. Rusch Engineering Honors Program 2021

USC Academic Achievement Award Scholarship 2021

USC Center for the Instruction of Mathematics to Engineering Students (CIMES) Engineering Mathematics Prize 2021
 4 recipients. Awarded for Calculus III.

TEACHING

USC Center for AI in Society's Student Branch (CAIS++) August 2021 - Present

- Maintained an artificial intelligence curriculum at <https://caisplusplus.usc.edu/curriculum/>
- Each fall, I taught a semester-long undergraduate artificial intelligence curriculum to > 40 undergraduates
- Mentored 2 artificial intelligence for social good research project teams
- Conducted K-12 machine learning education outreach

Discrete Methods in Computer Science (CSCI 170) January 2021 - May 2021

- Updated and instructed discrete mathematics (e.g. logic, set theory, graph theory) curriculum
- Led weekly office hours and graded midterms and final examinations

SERVICE, & LEADERSHIP

USC Center for AI in Society's Student Branch (CAIS++) Co-President (May 2022 - May 2023) • Project Lead (Jul 2022 - May 2023) • Curriculum Lead (Aug 2021 - Present) • VP of Operations (Aug 2021 - Apr 2022)

USC Association for Computing Machinery (ACM) Vice President (Jan 2022 - May 2022) • Operations Co-Chair (Dec 2020 - Dec 2021) • Events & Membership Coordinator (Aug 2020 - Nov 2020)

USC Business Tech Group (BTG) ML Project Advisor (May 2022 - May 2023)

SKILLS

Languages: Python | C++ | HTML | CSS | MATLAB | Java | Swift | Javascript
Python Libraries: Pytorch | Tensorflow | Scikit-learn | Pandas | NLTK | OpenCV | NumPy | Matplotlib | Tensorboard
Research Tools: SSH | Slurm | WandB | \LaTeX | Figma | Photoshop | Website Development