Adrian S. Roman

(+1) 650-656-0807
romanguz@usc.edu
adriansroman.github.io
GScholar Profile

Education

University of Southern California — Los Angeles, CA, US
M.S. in Computer Science (Focus on AI) — 2023 - 2025 *(expected)*
- Research area: Machine Listening and Artificial Intelligence

University of California Davis — Davis, CA, US
B.S. in Computer Science — 2016 - 2021

University of California Davis — Davis, CA, US
B.S. in Applied Mathematics — 2016 - 2021

Stanford University — Stanford, CA, US
Certificate in Data Science (Data Mining & Statistical Learning) — 2018

Professional Experience

Software Engineer (Full Time), Tesla Inc. | Palo Alto, CA, US — 2021.12 - Present
- Developed a neural network to perform speech enhancement using time-frequency masks on custom microphone arrays.
- Carried out the fine-tuning of an automatic speech recognition (ASR) model including in-house data collection and curation efforts.
- Built sound event detection (SED) neural networks for emergency vehicle detection.
- Developed UI/firmware and AudioWeaver frameworks to enable the next generation of adaptive chime mixing in Cybertruck and S3XY vehicles.
- Designed Python signal processing tests with hardware-in-the-loop automations to validate audio software development and releases.

Software Engineer (Internship), Tesla Inc. | Palo Alto, CA, US — 2021.4 - 2021.12
- Designed and developed signal processing tests written in Python to ensure bit-perfect audio quality in audio digital signal processors (DSP) and TDM audio streaming.
- Developed speech simulations to benchmark word error rate (WER) on various closed- and open-source ASR models.
- Wrote a infotainment audio diagnostics app that runs DSP commands through UI. The app is used around the globe by Tesla engineers and technicians.

Software Engineer (Internship), Oscillo Biosciences. | CT, US — 2019.6 - 2021.9
- Developed numerical methods and optimized algorithms to runs a network with hundreds of nonlinear oscillators to perform beat music tracking.
- Deployed the algorithm in Synchrony^{TM} LEDs to display synchronizing lighting patterns to the beat of music.
- Lead full-stack developer of the iOS app Adaptive Rhythmic Training (ART) that implements a rhythmic therapy for language pathologies.

<table>
<tr><td>PUBLICATIONS</td><td>

1. **Roman, A. S.,** Roman, I. R., & Bello, J. P. (2024) Self-supervised Latent Acoustic Mapping for Direction of Arrival Estimation. *In Review.*

2. Roman, I. R., Steers, B., Felix-Dias, F., Pedini, F, M., **Roman, A. S.,** Bogh, J., Silva, C., & Bello, J. P. (2024) EKOS: Symbolically Grounded Objects and Actions from Epic-Kitchens. *In Review.*

3. **Roman, A. S.,** Roman, I. R., & Bello, J. P. (2024, April). Robust DoA Estimation from Deep Acoustic Imaging. In ICASSP 2024-2024 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP) (pp. 1321-1325). IEEE.

4. **Roman, A. S.,** Balamurugan, B., & Pothuganti, R. (2024). Enhanced Sound Event Localization and Detection in Real 360-degree audio-visual soundscapes. arXiv preprint arXiv:2401.17129.

5. Roman, I. R., Ick, C., Ding, S., **Roman, A. S.,** McFee, B., & Bello, J. P. (2024, April). Spatial scaper: a library to simulate and augment soundscapes for sound event localization and detection in realistic rooms. In ICASSP 2024-2024 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP) (pp. 1221-1225). IEEE.

6. Roman, I. R., **Roman, A. S.,** Kim, J. C., & Large, E. W. (2023). Hebbian learning with elasticity explains how the spontaneous motor tempo affects music performance synchronization. PLOS Computational Biology, 19(6), e1011154.

</td></tr>
</table>

PRESENTATIONS

Guest Speaker at the DL4MIR Workshop at CCRMA | Stanford, CA, US   2023.8
- Robust DOA Estimation Using Deep Acoustic Imaging

Guest Speaker at the MARL lab meeting NYU | Online   2023.4
- Sound Localization Feature Extraction Using a Graph Signal-processing Model for Acoustic Imaging.

Oral Presentation: 2019 SMPC Conference | New York, NY, US   2019.8
- Individual Musician's Spontaneous Performance Rates Affect Interpersonal Synchrony in Joint Musical Performance: A Dynamical Systems Model.

Poster Presentation: Undergraduate Research Conference | Davis, CA, US   2019.6
- Individual Musician's Spontaneous Performance Rates Affect Interpersonal Synchrony in Joint Musical Performance: A Dynamical Systems Model.

TEACHING

Academic Assistance and Tutoring Center | Davis, CA, US   2021.1 - 2021.3
- Tutored students taking upper-division Probability Theory (MAT135A).
- Carried out in-person and virtual homework workshops.

Curriculum Creator & Tutor, CS4K club | Palo Alto, CA, US   2019.9 - 2020.12
- Taught computer science to kids in undeserved schools from the CA YOLO County.
- Designed course material on programming concepts using Scratch MIT.

AWARDS AND HONORS

- **Dean's Honor List,** Winter 2021   UC Davis
- **Dean's Honor List,** Spring 2020   UC Davis
- **Mathematics Rearch Travel Award,** Summer 2019   UC Davis

EXTRA CURRICULAR

Music Training: 8+ years of independent music theory practice.
Instruments: Piano, Electric Bass, Alto Saxophone
Short Film-making