

Jonathan Zamora

✉ jonathan.zamora@usc.edu | 🌐 jonzamora.dev | 🔄 jonzamora | 📄 jonzamora18 | 🎓 Google Scholar

Education

University of Southern California August 2023 – May 2025 (Expected)
Master of Science in Computer Science Los Angeles, CA, USA
• Relevant Coursework: Deep Learning and its Applications, Robotics, Machine Learning

University of California San Diego June 2020 – June 2023
Bachelor of Science in Computer Science San Diego, CA, USA
• Relevant Coursework: Deep Learning, Deep Learning for 3D Data (Graduate Level), Intro to Visual Learning (Graduate Level), Intro to Computer Vision, Intro to AI: Search and Reasoning, Statistical NLP, Computer Graphics, CSE Honors Thesis, Intro to CS Research, Design and Analysis of Algorithms, Advanced Data Structures, Statistical Methods

Publications

Graph Inverse Reinforcement Learning from Diverse Videos

Sateesh Kumar, **Jonathan Zamora**^{*}, Nicklas Hansen^{*}, Rishabh Jangir, Xiaolong Wang
*Conference on Robot Learning (CoRL), 2022. **Oral (Top 6.5%).***

[arXiv](#) | [project page](#)

Contextualized Scene Imagination for Generative Commonsense Reasoning

Peifeng Wang, **Jonathan Zamora**^{*}, Junfeng Liu^{*}, Filip Ilievski, Muhao Chen, Xiang Ren
*International Conference on Learning Representations (ICLR), 2022. **Poster.***

[arXiv](#) | [code](#)

Biomedical image analysis competitions: The state of current participation practice

355 authors, including **Jonathan Zamora**
*arXiv, 2022. **Preprint.***

[arXiv](#)

Honors and Awards

McNair Scholar at UC San Diego	2022
California Louis Stoke Alliance for Minority Participation (CAMP) STEM Scholar at UC San Diego	2022
Viterbi Summer Undergraduate Research Experience Scholar at University of Southern California	2021
CSE Early Research Scholar (CSE ERSP) at UC San Diego	2021
Google Explore Computer Science Research (ExploreCSR) Scholar at UC San Diego	2020

Experience

University of Southern California: Geometry, Vision, and Learning Lab August 2023 – Current
Graduate Researcher Los Angeles, CA, USA
• I am currently working on Robot Learning research with Prof. Yue Wang

UC San Diego: Xiaolong Wang Lab November 2021 – August 2023
Undergraduate Researcher San Diego, CA, USA

- I co-led the development of 🔄 **Graph Inverse Reinforcement Learning (GraphIRL)** – an algorithm capable of **learning task rewards** for **goal-conditioned reinforcement learning** tasks with a **graph abstraction** from diverse videos.
- Our method was successfully applied to **robotic manipulation** and **cross-embodiment and cross-environment** generalization tasks.
- My work was supported by the **McNair Scholars Program** and **CAMP Summer Scholars Program**, two prestigious research programs for pre-doctoral first-generation undergraduate STEM researchers.
- I **implemented** and **evaluated** various Inverse RL algorithms including **XIRL**, **TCN**, and **LIFS** in **PyTorch**.
- I benchmarked the learned reward functions with the **Soft Actor-Critic (SAC)** Reinforcement Learning algorithm in **MuJoCo-based robotic manipulation tasks** with the **OpenAI Gym API**. I also applied these methods in the **X-MAGICAL** cross-embodiment cross-environment generalization benchmark.

- University of Southern California: Intelligence and Knowledge Discovery Lab** June 2021 – November 2021
Undergraduate Researcher Los Angeles, CA, USA
- I co-led the development of **Imagine-and-Verbalize (I&V)** – a method for imagining a relational Scene Knowledge Graph (SKG) with relations between the input concepts, and we leverage the SKG as a constraint when generating a plausible description of a visual scene.
 - Our method was successfully applied to **CommonGen**, a constrained text-generation challenge for generative common-sense reasoning, as well as **visual storytelling**
 - My work was supported by the **USC Viterbi Summer Undergraduate Research Experience Program**, a selective summer research program for pre-doctoral first-generation undergraduate STEM researchers.
 - I **implemented** and **evaluated** various text-generation models, including **T5**, **KG-BART**, **EKI-BART**, and **KFCNet** in **PyTorch** with the **HuggingFace Transformers** package.

- UC San Diego: Advanced Robotics and Controls Lab** January 2021 – November 2021
Undergraduate Researcher San Diego, CA, USA
- I led the development of **ARCseg** – a semantic segmentation benchmark for use with surgical video datasets.
 - I implemented popular semantic segmentation algorithms including UNet, UNet++, DeepLabV3+, and MANet in PyTorch
 - I led a team of researchers in the MICCAI 2021 HeiSuRF Surgical Scene Understanding Challenge, where we earned 4th place out of 8 teams in a competition for multi-class semantic segmentation on a challenging laparoscopic surgical video dataset
 - Our contributions were published alongside 350+ researchers in a study on biomedical image analysis competitions

- UC San Diego: Berg Lab** October 2020 – June 2021
Undergraduate Researcher San Diego, CA, USA
- I co-led the development of **BASEDNet** – a method for determining the feasibility of transcribing historical documents via Optical Character Recognition. We determine the feasibility by analyzing the quality of each sentence's baseline, the imaginary line a sentence rests on, and seeing if the document as a whole is likely to be transcribed successfully.
 - I implemented a **Convolutional Neural Network (CNN)**-based **binary image classifier** in **Tensorflow**, and this acted as a **discriminator** between likely and unlikely candidates for successful document transcription.
 - My work was supported by the **UCSD CSE Early Research Scholars Program**, a selective 1-year research program which introduces students from underrepresented groups in computing to research
 - I presented my work at the end-of-year CSE ERSP research conference alongside my group of 3 other undergraduates

- UC San Diego: Mesirov Lab** May 2020 – December 2021
Undergraduate Researcher San Diego, CA, USA
- I co-led the development of the **Seurat Suite** – an accessible set of Jupyter Notebooks for conducting end-to-end analysis of scRNA-seq data with the Seurat package, written in R.
 - My work is part of GenePattern, a computational biology software package used by nearly 500,000 users worldwide
 - My work has been presented at the MIT-Harvard Broad Institute as part of a Winter 2020 showcase

- UC San Diego: System Energy Efficiency Lab** January 2020 – August 2020
Undergraduate Researcher San Diego, CA, USA
- I developed an **Epileptic Seizure Prediction** model using **Logistic Regression** and **scikit-learn**
 - My work was supported by the **Google Explore Computer Science Research (ExploreCSR) Program at UC San Diego**, a selective semester-long program for community college students interested in conducting a short-term research project.

Leadership

- UC San Diego: Association for Computing Machinery**
President: ACM AI (Artificial Intelligence) Board May 2022 – May 2023
- Lead AI board, workshops, and competitions for **1300+** ACM AI members
 - Spearhead development of AI Competition with **\$5,000 in prizes** for competitors and **\$3,000** for our organization
 - Led and developed workshops covering **search algorithms**, **multi-agent search**, and **deep reinforcement learning** for 100+ members at in-person workshops

- Director of Marketing and Sponsorship: ACM AI (Artificial Intelligence) Board October 2020 – May 2022
- Organized AI workshops, projects, research talks, and competitions for **1000+** ACM AI members

- Coordinated marketing and sponsorship staff in spearheading outreach campaigns to **3500+** ACM members
- Mentored **4 cohorts** of ACM AI Quarterly Projects teams on **Computer Vision** and **Deep Reinforcement Learning**

UC San Diego: Computer Science and Engineering (CSE) Undergraduate Committee

Undergraduate Student Representative

September 2022 – May 2023

- Provide student perspective for decisions about CSE curriculum, department operations, and awards alongside CSE faculty and staff

Current Mentees

Xander Hinrichsen (BS, UCSD)

2023 – Current

Academic Service

International Conference on Computer Vision (ICCV) - NeRF4ADR Workshop

2023

Workshop Presentations

Graph Inverse Reinforcement Learning from Diverse Videos

Sateesh Kumar, **Jonathan Zamora***, Nicklas Hansen*, Rishabh Jangir, Xiaolong Wang

*Deep RL Workshop at Conference on Neural Information Processing Systems (NeurIPS), 2022. **Poster.***

*Aligning Robot Representations with Humans at Conference on Robot Learning (CoRL), 2022. **Poster.***

[arXiv](#) | [project page](#)

Teaching

Grossmont Community College: Computer Science Open Lab

08/19 – 12/20; 08/23 – Current

Computer Science Tutor

San Diego, CA, USA

- Assisted **400+** students in **all core lower-division Computer Science courses**.
- Courses tutored include Data Structures in Java, Data Structures in C++, Systems Programming, Python, SQL, Programming Logic, and Discrete Structures.

Skills

Technical Languages: Python, R, SQL, C++, Java, MATLAB, Swift, LaTeX

Frameworks: PyTorch, Tensorflow, Scikit-Learn, NumPy, Pandas, Matplotlib, OpenCV, OpenAI Gym, MuJoCo

Tools: Docker, Kubernetes, SLURM, Git, Bash, Unix/Linux

Spoken Languages: Spanish (Native), English (Native)