Jonathan Zamora

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Education

University of Southern California

Master of Science in Computer Science

• Relevant Coursework: Deep Learning, Robotics, Machine Learning, Algorithms

University of California San Diego

Bachelor of Science in Computer Science

• 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	e Researcl	ner										Los Angeles, CA, USA	
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• I am currently working on Robot Learning research with Prof. Yue Wang and Prof. Daniel Seita

UC San Diego: Xiaolong Wang Lab

Undergraduate Researcher

November 2021 - August 2023 San Diego, CA, USA

- I co-led the development of G 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.

August 2023 - May 2025 (Expected) Los Angeles, CA, USA

> June 2020 – June 2023 San Diego, CA, USA

University of Southern California: Intelligence and Knowledge Discovery Lab

Undergraduate Researcher

- 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 commonsense 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 **evaluted** 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 San Diego, CA, USA

Undergraduate Researcher

- I led the development of **ARCSeg** a semantic segmentation benchmark for use with surgical video datasets.
- $\bullet \ I \ implemented \ popular \ segmentation \ algorithms \ including \ UNet, UNet++, Deep LabV3+, and \ MANet \ in \ Py Torch$
- 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

Undergraduate Researcher

- 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

Undergraduate Researcher

- 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

Undergraduate Researcher

- 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

- 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 Oct

Organized AI workshops, projects, research talks, and competitions for 1000+ ACM AI members



May 2022 - May 2023

May 2020 – December 2021

January 2020 - August 2020

October 2020 - June 2021

San Diego, CA, USA

San Diego, CA, USA

San Diego, CA, USA

- 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

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

Current Mentees

Xander Hinrichsen (BS, UCSD)

Academic Service

International Conference on Computer Vision (ICCV) - NeRF4ADR Workshop

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

Grossmor	ıt	Com	munity	College:	Computer	Science	Open	Lab
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Computer Science Tutor

- 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)

08/19 - 12/20; 08/23 - Current

San Diego, CA, USA

2023 - Current

2023

September 2022 - May 2023