

Armin Bazarjani

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EDUCATION

University of Southern California

Ph.D. in Computational and Cognitive Neuroscience

Master of Science, Electrical Engineering (3.8 GPA)

Bachelor of Science, Electrical Engineering

Los Angeles, California

2023 – 2028 (*expected*)

2020 – 2021

2016 – 2020

EXPERIENCE

Graduate Researcher

University of Southern California, Supervisor: Dr. Payam Piray

June 2023 – Present

Los Angeles, CA

- Implemented an episodic memory buffer into a popular RL world model (DreamerV3) and showed that a simple episodic memory component can help in environments that require long-term memory.
- Experimented with using different types of Deep RL models (model-based and model-free) as encoding models for the brain. Compared predictive accuracy of each model to see if there was a distinction in the brain.
- Extended a popular predictive representation based reinforcement learning model (default representation) with a novel, feature-based, approach. Our extension also allowed for key element of compositionality to be maintained in a fully feature-based definition. We also mathematically proved convergence (NeurIPS, under review).
- Extended reinforcement learning models for brain decision-making, achieving efficient online learning with policy-independent environmental representations for task transfer, providing a normative and unified explanation for seemingly disparate behavioral differences in human decision making tasks (Nature Communications, under review).

Research Engineer

Honda Research Institute, Supervisor: Dr. Behrzad Dariush

Dec. 2021 – Mar. 2023

San Jose, CA

- Developed a unified framework for the joint problem of trajectory prediction and imputation. This was the pioneering work that suggested and filled the gap in benchmarks and techniques for this joint problem (CVPR, 2023).
- Developed predictive models for road scene classification and segmentation into an orthographic bird's-eye view (BEV) frame. Explored temporal architectures to handle long and short-term context and address occlusions.
- Assisted in deploying a real-time trajectory prediction model onto a vehicle. Responsibilities included model fine-tuning with real-world data, optimizing preprocessing and post-processing methods for efficiency, and adapting the inference pipeline for hardware constraints.

PUBLICATIONS

Armin Bazarjani & Payam Piray “Default Feature Representations of the Cognitive Map” *Under Review at NeurIPS 2026*

Armin Bazarjani & Payam Piray “Efficient Learning of Predictive Maps for Flexible Planning” *Under Review at Nature Communications 2025*

Yi Xu, **Armin Bazarjani**, Hyung-gun Chi, Chiho Choi, Yun Fu “Uncovering the Missing Pattern: Unified Framework Towards Trajectory Imputation and Prediction” *Conference on Computer Vision and Pattern Recognition (CVPR) 2023*

PATENTS

Yi Xu, **Armin Bazarjani**, Hyung-gun Chi, Chiho Choi, Yun Fu “Trajectory imputation and prediction” *Google Patents*, Patent No. US20240160812A1

INTERNSHIPS & UNDERGRADUATE EXPERIENCE

Center for Artificial Intelligence in Society (CAIS), USC

Undergraduate Researcher, Supervisor: Dr. Bistra Dilkina

Feb 2021 – Jun 2021

Los Angeles, CA

- Assisted in the implementation and testing of an unsupervised clustering and classification network parameterized by a Gaussian mixture model for camera-trap images. Tested our approach against current state of the art clustering benchmarks such as DEC and DeepCluster.

Neuro Imaging With Deep Learning Lab (NIDL), USC

Sep 2019 – Jul 2020

Undergraduate Researcher, Supervisor: Dr. Hosung Kim

Los Angeles, CA

- Artificial brain aging on fMRI photos using GANs to identify neurodegeneration. Improved U-net and Capsule Net segmentation with the addition of multi-scale highlighted foregrounds for white matter hyperintensities. Established standardized image processing pipeline for MRI photos using a shell script with fsl commands.

Autonomous Networks Research Group (ANRG), USC

Summer 2019

Undergraduate Researcher, Supervisor: Dr. Bhaskar Krishnamachari

Los Angeles, CA

- Proposed and implemented novel ML solution to estimate vehicular communication ranges in dynamic systems.

Qualcomm

Summer 2018

Software Engineering Intern, Supervisor: Dr. Suhail Jalil

San Diego, CA

- Created a C-sim for facial recognition hardware, converted existing code into C++. Produced a parsing script to optimize product testing for current and future engineers.

Qualcomm

Summer 2017

Software Engineering Intern, Supervisor: Dr. Suhail Jalil

San Diego, CA

- Used machine learning on capacitive signals from touch screens to identify if a user was an adult or a child. Project was accepted to the Qualcomm Machine Learning Summit for Fall 2017.

REVIEWING

Journals: Nature Communications

Conferences: CVPR

TECHNICAL SKILLS

Languages: Python, C/C++, JavaScript, HTML/CSS, Matlab

Frameworks: PyTorch, TensorFlow, Keras

Developer Tools: Git, Docker, VS Code, Visual Studio, PyCharm

Libraries: Pandas, NumPy, Matplotlib, Gymnasium, Scikit-Learn, OpenCV, JAX