Jacob Yeung

jacobyeung01@gmail.com | (510) 857-9096 | github.com/jacobyeung | jacobyeung.org

Education

University of California, Berkeley Expected Graduation: December 2022
B.S. in Electrical Engineering and Computer Science, Honors Program, Dean's List

- Thesis: *"Extraction of Dynamical Subspaces in Time Series Data with External Dynamics Components Analysis"*. URL.
- Coursework: Probability and Random Processes, Machine Learning, Time Series Analysis, Deep Learning, Visual Neuroscience, Neural Computation

Publications

1. **Yeung, J.**, Narasimhan, M., Darrell, T., Reed, C., Dunn, A., Imong, I. (2022) *"Camera Trap Animal Re-ID and Census."* Google AI for Social Good Workshop. URL.

2. Livezey, J.A., Hwang, A., **Yeung, J.**, Bouchard, K.E. (2022) *"Hangul Fonts Dataset: A Hierarchical and Compositional Dataset for Investigating Learned Representations."* International Conference on Image Analysis and Processing. URL.

Manuscripts in preparation

1. **Yeung, J.**, Bak, J.H., Bouchard, K.E. *"Discovery of Linked Neural and Behavioral Subspaces with External Dynamic Components Analysis."* Computational and Systems Neuroscience 2023. URL.

2. Meng, R., **Yeung, J.**, Kim, W.H. *"Graph Neural Network: Multi-scale Gated Spatio-Temporal Graph Transformer."* International Conference on Learning Representations 2023 *(under review)*.

3. **Yeung, J.**, Narasimhan, M., Darrell, T. *"Continual Learning for Camera Trap Animal Re-ID and Census."*

Presentations

1. **Yeung, J.**, Bak, J.H., Bouchard, K.E. (2022). *"Simultaneous, unsupervised discovery of 'causally linked' neural and behavioral subspaces with external Dynamic Components Analysis."* The Society for Neuroscience, poster. URL.

2. **Yeung, J.**, Narasimhan, M., Darrell, T. (2022) *"Camera Trap Animal Re-ID and Census."* Google AI for Social Good Workshop, talk. URL.

Experience

Berkeley Artificial Intelligence Research Lab March 2022 - Present
Research Assistant Berkeley, CA

Project: Camera Trap Re-Identification | Supervisor: Trevor Darrell

- Developing continual and self-supervised learning approaches to re-identify and take census of wild animals from unlabeled camera trap images. Publication 1. Presentation 2.
- Sample temporally adjacent frames as positives, in addition to augmentations, for self-supervised training objective

Project: Snowpack Estimation Benchmark Dataset | Supervisor: Trevor Darrell

- Centralizing and standardizing spatiotemporal, multi-modal, and multi-resolution datasets from hydrology.

University of Texas, Arlington March 2022 - Present
Research Assistant Berkeley, CA

Project: Multi-scale Gated Spatio-Temporal Graph Transformer | Supervisor: Won-Hwa Kim

- Developing graph neural network architecture to exploit local and global graphical structures using statically and dynamically learned adjacency matrices. In progress 2.
- Extending multi-head attention to multi-scale attention using 1D temporal convolutions of differing kernel sizes

Lawrence Berkeley National Laboratory August 2020 - Present
Research Assistant Berkeley, CA

Project: eDCA: External Dynamical Components Analysis | Supervisor: Kristofer Bouchard

- Researching linear dimensionality reduction technique to identify subspaces of two time series with maximal mutual information. Presentation 1.
- Identifying neural subspaces relevant to behavioral subspaces in macaque reaching and speech production.
- Developing and deploying large scale simulations and analysis on NERSC's HPC supercomputers.

Project: Hangul Fonts Dataset | Supervisor: Kristofer Bouchard

- Developed an unsupervised deep learning framework for creating, training, and hyperparameter tuning $\beta-$variational autoencoders. Publication 2.
- Applying framework to study deep learning representations of the compositional structure of a synthetic Hangul font dataset. Demonstrated deep networks poorly learn the generative latent structure of data.

Cisco Systems May 2019 – August 2019
Software Engineering Intern San Jose, CA

- Developed dynamic dashboard, from scratch, using React to display critical live information for customer. Used by Cisco and AWS.
- Wrote functions to automate reformatting and requesting ACL Lines from Mongo DB. Automation works and in current use.

Teaching Experience

University of California, Berkeley January 2021 - May 2022
Teaching Assistant Berkeley, CA

- Spring Semester, 2022. TA for Communication Networks (EE 122). Teaching a section of 10-20 students every week. Answering questions via office hours and online forum. Creating discussions and exams. Grading exams.
- Spring Semester, 2021. Tutor for Data Structures (CS 61B).
- Spring Semester, 2021. Tutor for Machine Architecture (CS 61C).

Mentorship Experience

BioEngineering High School Competition February 2022 - April 2022
Research Mentor Berkeley, CA

- Outreach program that provides research mentorship on identifying a problem in biology and designing a solution to local highschoolers.

Projects

1. **Yeung, J.**. (2022) *"Visual Cortex-Inspired Artificial Neural Network Architecture."*
2. **Yeung, J.**, *Xu, O., *Dong, A. (2021) *"Pruning Convolutional Neural Networks Using the Tucker Decomposition."* URL.
3. *Kadavath, S., *Paradis, S., ***Yeung, J.** (2020). *"DeepChrome 2.0: Investigating and Improving Architectures, Visualizations, & Experiments."* URL.

Programming Skills

Languages: Python, Golang, C, Java, R, Matlab, C++
Technologies: PyTorch, mpi4py, SLURM, Docker, Git, Linux, Bash, GDB, GCP