Joel G. Yancey

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CORE COMPETENCIES

Full stack development, GUI, User Experience (UX) , scientific programming, HPC, bioinformatics, parallel programming, systems administration, Linux, C++, Python, R, MATLAB, web development, data visualization, machine learning, algorithm design

CERTIFICATIONS

UNIX & Linux System Administration *University of California, San Diego; Extension* — San Diego, CA, 11/2020

EDUCATION

Neuroscience, B.S. *University of California, Los Angeles; College of Letters and Science* — Los Angeles, CA, 09/2017

Bioinformatics Minor *University of California, Los Angeles; Samueli School of Engineering and Applied Science*

WORK EXPERIENCE

Scientific Programmer I (full time) — San Diego, CA
Computational Neurobiology Laboratory, Salk Institute for Biological Studies | Sejnowski Lab — 11/2022 – 12/2023

- Developed a Python API for C++ programs used in image registration/image processing
- Built and maintained AlignEM-SWiFT, a cross-platform Qt/GUI application for EM image registration (or "alignment"). The app is currently deployed and in daily use by scientists on the high performance computer (HPC) Lonestar6 at the Texas Advanced Computing Center (TACC). It has been cited in published and ongoing research. It runs on macOS, Debian, Ubuntu, and CentOS.
- Designed deployment and distribution strategies for compiled software application to run on HPC systems including systems at TACC
- Debugged and improved data pipeline for 3D reconstruction and cell modeling (MCell)

Jr. Systems Administrator (full time) — San Diego, CA
Computational Neurobiology Laboratory, Salk Institute for Biological Studies | Sejnowski Lab — 10/2019 – 11/2022

- Maintained essential IT infrastructure used in computational neurobiology research, including operating systems, security tools, applications, servers, email systems, laptops, desktops, software, and hardware
- Installed, configured, maintained, upgraded workstations and experiment rigs running Linux or Windows
- Wrote bash scripts, created custom software images, and security tested Debian-based computing machines
- Configured virtual machines for security testing, system monitoring, and performance testing
- Assembled compute workstations to meet the hardware and software needs of Salk personnel

Research Assistant I/Lab Manager (full time) — San Diego, CA
Sanford Burnham Prebys Medical Discovery Institute | Xu & Huang Lab — 07/2018 – 10/2019

- Developed a novel phagocytosis quantification assay used in published research (*Journal of Experimental Medicine*).
- Wrote Python scripts and Excel VBA macros for analysis of genetic and other bioinformatics data.
- Analyzed batches of Next-Gen Sequencing (NGS) data, such as RNA-seq data to investigate differential gene expression
- Managerial responsibilities included purchasing, training coworkers in the use of scientific instruments, acquisition and installation of laboratory equipment, primary contact for all oversight compliance, i.e. AAALAC and OSHA

Undergraduate Researcher (volunteer) — Los Angeles, CA
University of California, Los Angeles | Buonomano Lab — 07/2012 – 07/2015

- Developed a graphical user interface (GUI) in MATLAB for conducting a novel experiment according to protocol
- Used machine learning classification algorithms (Support Vector Machines) to investigate the temporal information in neural population responses. Scripted publication-quality figures such as rasters, PSTHs, and plots of neural activity.
- Oversaw a multi-year *in vivo* electrophysiology experiment investigating how the brain encodes spatial and temporal sensory events on timescales of 10-100s of milliseconds.

Laboratory Assistant (part-time) — Los Angeles, CA
UCLA Brain Research Institute, Microscopic Techniques & Electron Microscopy Core Facility — 06/2014 – 09/2014

- Developed film and facilitated access to UCLA's common equipment JEOL 100CX transmission electron microscope.
- Performed histology including cryosectioning, mounting, and staining of brain and other tissues

COMPUTER SCIENCE COURSEWORK

C++	Advanced Programming (PIC 10C, UCLA) Intermediate Programming (PIC 10B, UCLA) Introduction to Programming (PIC 10A ,UCLA)
UNIX & Shell	UNIX & Linux Shell Programming (CSE-40079, UCSD Ext.) UNIX & Linux Security Fundamentals (CSE-41272, UCSD Ext.) UNIX & Linux System Administration I (CSE-41269, UCSD Ext.) UNIX & Linux System Administration II (CSE-41270, UCSD Ext.)
Python	Algorithms in Bioinformatics & Systems (CS CM 122, UCLA) Computational Genetics (CS CM 124, UCLA) Computational and Systems Biology (CS M184, UCLA)
R	Probability Theory (STATS 100A, UCLA) Statistical Methods for Life Sciences (STATS 13, UCLA)
Discrete Math	Design & Analysis of Algorithms (CSE 101, UCSD) Linear Algebra and Applications (MATH 33A, UCLA) Intro to Discrete Structures (MATH 61, UCLA)

SELECTED PUBLICATIONS

MCell4 with BioNetGen: A Monte Carlo Simulator of Rule-Based Reaction-Diffusion Systems with Python Interface *PLOS Computational Biology* — Accepted for publication 01/2024

Adam Husar, Mariam Ordyan, Guadalupe C. Garcia, Joel G. Yancey, Ali S. Saglam, James R. Faeder, Thomas M. Bartol, Terrence J. Sejnowski.

Contribution: programming, data visualization
Affiliation: Computational Neurobiology Laboratory at Salk Institute, La Jolla, CA
DOI : https://doi.org/10.1101/2022.05.17.492333

Multiomic landscape and functional analysis of Alzheimer's disease-associated gene variants in human ESC-derived microglia *Journal of Experimental Medicine* — 12/2020

Liu T., Zhu B., Liu Y., Zhang X., Yin J., Li X., Hodges A., Zhou L., Yancey J., McQuade A., Blurton-Jones M., Huang T., Tanzi R., Xu H.

Contribution: data curation, formal analysis, software
Affiliation: Neuroscience Initiative, Sanford Burnham Prebys Medical Discovery Institute, La Jolla, CA
DOI : https://doi.org/10.1084/jem.20200474

Role of Rab GTPases in Alzheimer's Disease *ACS Chemical Neuroscience* — 02/2019

Zhang X., Huang T., Yancey J., Luo H., and Zhang Y.

Contribution: writing, editing
Affiliation: Neuroscience Initiative, Sanford Burnham Prebys Medical Discovery Institute, La Jolla, CA
DOI : https://doi.org/10.1021/acschemneuro.8b00387

POSTER PRESENTATIONS & SOFTWARE DEMONSTRATIONS

AlignEM-SWiFT: Open-source Software for Aligning Electron Micrographs using Signal Whitening Fourier Transforms — San Diego, CA 2022

Yancey J. G., Bartol T. M., Wetzel A., Carson J., Mendenhall J. M., Thiyagarajan V., Kuwajimak M., Harris K.M., Sejnowski T. J.
Society for Neuroscience 2022

Source code: https://github.com/mcellteam/swift-ir/tree/joel_develop
PDF : https://mcell.org/sfn22_poster.pdf
YouTube: https://youtu.be/mO8jPS_RUDg

AlignEM-SWiFT: Graphical Interface for Aligning Electron Micrographs using Signal Whitening Fourier Transforms — Austin, TX 2022

Yancey J. G., Bartol T. M., Wetzel A., Carson J., Mendenhall J. M., Thiyagarajan V., Kuwajimak M., Harris K.M., Sejnowski T. J.
2022 TACCSTER Symposium @ Texas Advanced Computing Center

Decoding Stimulus Features From Cortical Population Responses — Los Angeles, CA 2015

Yancey, J., Halladay, L., DeGuzman, R., Blair, T., & Buonomano, D.
2015 UCLA Neuroscience Undergraduate Poster Fair.

PDF / source code : https://github.com/joelyancey/SRP199-Poster-UCLA

Neuroscience Model Builder C++/Qt tool for visually constructing diagrams ("models") of neural circuits. The open source code and can be downloaded from GitHub and compiled. Updated and tested 2021-01-29 on Debian GNU/Linux 10 (buster).

Source code : https://github.com/joelyancey/finalProject_neuralNetwork
YouTube : https://youtu.be/AZcQfiHGj8g