Gabriel Riegner

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INTERESTS image and signal analysis, statistics, machine learning, computational neuroscience, medical applications

EDUCATION

2022 - present **University of California San Diego:** PhD in Data Science — San Diego, CA
Advisors: Armin Schwartzman PhD, Pamela Reinagel PhD
3.87/4 GPA Selected coursework: linear regression, linear algebra, optimization, data science algorithms, statistical models, high dimensional statistics, machine learning, topological analysis, data ethics, network science

2015 - 2019 **University of Southern California:** BA with honors in Neuroscience — Los Angeles, CA
Advisors: Assal Habibi PhD, Sarah Bottjer PhD, Irving Biederman PhD
Thesis: Recognition memory for musical melody
3.83/4 GPA Selected coursework: cell biology and physiology, neurobiology, systems and cognitive neuroscience

2017 **University of Otago**: one semester exchange program — New Zealand

TRAINING

2023 Neuromatch Academy Deep Learning: summer course on multi-layer perceptrons, convolutional neural networks, natural language processing, and reinforcement learning using PyTorch
Project: Evaluating the role of U-Net architecture in image segmentation

2022 San Diego Supercomputer Center: course on high performance computing and GPU/CPU programming

EXPERIENCE

2022 - present **Graduate student researcher:** Halicioğlu Data Science Institute — UC San Diego
Advisors: Armin Schwartzman PhD, Pamela Reinagel PhD, Samuel Davenport PhD
Role: developed statistical methods and software for image and signal analysis in the neurosciences
Projects: Estimating fMRI timescale maps
Testing the spatial correlation between brain maps by subsampling
Addressing nonstationarity in drift diffusion models of decision making

2024 - present **Research Consultant:** LC Pharmaceuticals — San Diego
Role: supported a clinical trial on transdermal drug delivery systems with experimental design, survey and biometric analysis, and stakeholder presentations

2024 **Google Summer of Code Contributor:** NumFOCUS — Remote
Advisors: Tony Bagnall PhD, Matthew Middlehurst PhD
Role: contributed to aeon toolkit, an open-source python package for time series machine learning
Project: Time series classification from EEG data

2019 - 2022 **Senior research technician:** Brain Mechanisms of Pain and Health Lab — UC San Diego
Advisor: Fadel Zeidan PhD
Role: supported clinical trials with experimental design, qualitative pain testing, and brain imaging analysis
Projects: Clinical trial on the brain mechanisms of chronic pain relief by meditation
Clinical trial on the role of endogenous opioids in chronic pain relief by meditation
Pilot study on the effects of meditation during awake craniotomy surgeries

2021 - 2022 **Senior research technician:** Center for Psychedelic Research — UC San Diego
Advisors: Fadel Zeidan PhD, Jon Dean PhD
Role: supported pilot studies with experimental design, qualitative pain testing, and brain imaging analysis
Projects: Pilot study on the brain mechanisms of phantom-limb pain relief by psilocybin
Pilot study on the brain mechanisms of chronic pain relief by vaporized cannabis

2015 - 2019 **Research technician:** Brain and Creativity Institute — University of Southern California
Advisor: Assal Habibi PhD
Role: led study through all phases from experimental design to thesis writing and defense
Project: Modeling recognition memory for music using signal detection theory

SKILLS skill level: 1 beginner, 2 intermediate, 3 advanced

Programming	**Python:** NumPy, Pandas, SciPy, Matplotlib, Scikit-Learn, and PyTorch libraries	3
	R: Tidyverse libraries	2
	Version Control: Git and GitHub	3
	Neuroimaging: Nilearn, FSL, BIDs, fMRIPrep, and ASLPrep softwares	3
Computing	**High Performance Computing:** PBS and SLURM resource managers	2
	Cloud Computing: Amazon Web Services (AWS) S3 and EC2	2
	Reproducibility: Docker and Singularity containers	2
Packaging	**Deployment:** PyPI and conda forge	1
	Documentation: Sphinx, Read the Docs	1
	Testing/CI: Pytest, GitHub Actions	3
Clinical	**MRI/EEG:** GE and Siemens scanner operation, and BrainVision neurosignal recording	3
	Physiology: Biopac biosignal recording	3
	Clinical Procedures: quantitative sensory pain testing and straight leg raise test of nerve pain	3
UI/UX	**Software:** Adobe and Affinity for raster and vector graphics	3
	Web Design: HTML and CSS for static websites	2

PUBLICATIONS access papers on google scholar

In Preparation
Estimating fMRI timescale maps
G Riegner, S Davenport, B Voytek, A Schwartzman [code] [manuscript draft]

2025
Mindfulness meditation and placebo modulate distinct multivariate neural signatures to reduce pain
G Riegner, J Dean, T Wager, F Zeidan. ***Biological Psychiatry*** [code] [press release] [commentary article]

2024
Self-regulated analgesia in males but not females is mediated by endogenous opioids
J Dean, M Reyes, V Oliva, L Khatib, **G Riegner**, et al. ***PNAS Nexus*** [press release]

2024
I feel your pain: higher empathy is associated with higher posterior default mode network activity
V Oliva, **G Riegner**, J Dean, L Khatib, et al. ***PAIN***

2023
The role of endogenous opioids in mindfulness and sham-mindfulness meditation for the direct alleviation of evoked chronic low back pain: a randomized clinical trial
L Khatib, J Dean, V Oliva, **G Riegner**, et al. ***Nature Neuropsychopharmacology***

2023
Neural and psychological mechanisms in the relationship between resting breathing rate and pain
V Oliva, J Baumgartner, S Farris, **G Riegner**, et al. ***Mindfulness***

2022
Disentangling self from pain: mindfulness meditation-induced pain relief is driven by thalamic-default mode network decoupling
G Riegner, G Posey, V Oliva, Y Jung, et al. ***PAIN, selected as editor's choice*** [press release]

CONFERENCES

2022
Meditation reduces pain through stimulus-specific and general brain representations of negative affect
Society for Neuroscience [poster]

2022
Meditation effects sensory but not extra-sensory cerebral pain signatures
US Association for the Study of Pain

2021
Neurofunctional connections supporting mindfulness-based pain relief
Society for Neuroscience [slides]

ADVISING

2024 - 2025 **Data Science Capstone**: Jennifer Hung, Judel Ancayan, Sahana Narayanan [project]
2024 - 2025 **Data Science Capstone:** Vicky Li, Anastasiya Markova, Zhuoxuan Ju [project]
2023 - 2024 **Honors thesis:** Milka Waniak [thesis]
2023 - 2024 **Data Science Capstone:** Daphne Fabella, Daniel Zhang, Terho Koivisto, Andrew Cheng [project]

SCHOLARSHIP

2022 **UCSD Competitive Edge Program:** summer research stipend
2015 - 2019 **USC Tuition Exchange Scholarship:** 80% tuition covered