Warren Woodrich Pettine
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Positions

Assistant Professor	University of Utah	2023

Education

Postdoctoral Fellow	Yale Medical School	2020-2023
Postdoctoral Associate	New York University	2017-2020
M.D.	University of Colorado	2012-2017
Medical Research Fellow	Stanford University	2015-2016
B.A., History and Philosophy	Colorado College	2004-2008

Predoctoral Research

Research Assistant	Harvard Medical School	2010-2012
Research Assistant	Colorado State University	2009-2010

Courses

Methods in Computational Neuroscience	Woods Hole, MA	2019
Computational Psychiatry Course	ETH, Zurich	2018
Associated Colleges in China (Mandarin language immersion)	Beijing, China	2006
Fudan University (Mandarin language study)	Shanghai, China	2004

Research Skills

Computational Modeling: Biophysical neural networks (dynamical systems); convolutional neural networks; artificial neural networks; reinforcement learning; Bayesian inference; drift diffusion models.
Analysis: Machine learning (deep learning, decision trees, etc.); parametric and nonparametric statistical techniques; linear/nonlinear regression; electrophysiology time-series; game theory; microeconomics; psychophysics.
Experimental: Nonhuman primates; electrophysiology; voltammetry; task design.
Programming: Python; Matlab; Linux/Unix; Bash; Slurm; JavaScript; HTML/CSS; SQL.

Fellowships & Awards

Intelligence Community Postdoctoral Fellow	2021- Present
National Institute of Health Loan Repayment Award	2018-2020
Joseph and Regina Glaser Research Prize for best medical student research project	2017
Howard Hughes Medical Institute Medical Fellow	2015-2016
American College of Physicians Young Achiever	2014
Bob Brockman, MD, Memorial Fund Scholarship for Medical Students & Residents	2013
Adler Scholarship	2013
Cum Laude, Colorado College	2008
Eagle Scout	2003

Research Funding & Support

SFARI HCBS Explorer Track Award (PI: John D. Murray, Co-PI: **Pettine**, Jacob) 11/01/2022-11/01/2024
Simons Foundation $500,000
Computational phenotyping of individual variation in latent-state learning, generalization and attention across the autism spectrum
This project will apply the models and behavioral tasks to study behavioral heterogeneity along the autism spectrum. It will also develop a novel computational phenotyping task with test-retest reliability. I wrote the proposal and will convert to a Co-PI upon attaining a faculty position. The work will contribute to the core of my research program.

NeuroPRSMH Seed Award (PI: Jacob, Co-PIs: **Pettine**, Murray) 10/01/2022-10/01/2023
University of Minnesota $20,000
Computationally Phenotyping of Psychotic Traits

This project will similarly apply the work from our Nature Human Behavior paper to study the relationship between attention alterations and psychotic traits. I also wrote this proposal, and the work will similarly contribute to my independent research program.

Publications

Human latent-state generalization through prototype learning with discriminative attention
Pettine, W. W., Raman, D., Redish, A.D., Murray, J.D
Nature Human Behavior, 2023

Cognitive mechanisms underlying prosocial decision making in callous-unemotional traits
Winters, D. E., **Pettine, W. W.**, Sakai, J. T.
PsyArXiv, 2022

Human latent-state generalization through prototype learning with discriminative attention
Pettine, W. W., Raman, D., Redish, A.D., Murray, J.D
PsyArXiv, 2021

Excitatory-inhibitory tone shapes decision strategies in a hierarchical neural network model of multi-attribute choice
Pettine, W. W., Louie, K., Murray, J. D, Wang, X. J.
PLoS Computational Biology, 2021

Laminar Segregation of Sensory Coding and Behavioral Readout in Macaque V4
Pettine, W. W., Moore, T., Steinmetz, N.
Proceedings of the National Academy of Sciences, 2019

Symbol addition by monkeys provides evidence for normalized quantity coding
Livingstone, M.**, Pettine, W. W.**, Srihasam, K., Moore, B., Morocz, I. A., Lee D.
Proceedings of the National Academy of Sciences, 2014

The Efficacy of Manual Axially Loaded Magnetic Resonance Imaging in Diagnosing Potential Thoracolumbar Osteoporotic Fracture Instability: A Case Report
Yazar, T., Delasotta, L. A., Pearson, A., Sidhu, G., Gruskay, J., Vaccaro, A., **Pettine**, **W.,** Radcliff, K., Kepler, C., Pettine, K.
The Open Spine Journal, 2011

Characterization of Novel Microelectrode Geometries for Detection of Neurotransmitters
Pettine, W., Jibson, M., Chen, T., Tobet, S., Nikkel, P., Henry, C. S.
IEEE Sensors Journal, 2011

Reviews and Book Chapters

A Role for Gaze Control Circuitry in the Selection and Maintenance of Visual Spatial Information
Moore, T., Jonikaitus, D., **Pettine, W. W**.
The Cognitive Neurosciences (Gazzaniga, M.). MIT Press, 2020

Prefrontal Contributions to Attention and Working Memory
Bahmani Z, Clark K, Merrikhi Y, Mueller A, **Pettine W,** Vanegas MI, Moore T, Noudoost B.
Current Topics in Behavioral Neurosciences, 2019

Leadership

Co-founder, CEO	Mountain Biometrics	2021-Present
Consultant	Colorado Division of Homeland Security and Emergency Management	2020
Director	The Colorado Medical Political Action Committee Board of Directors	2013-2015
Research Assistant	Dr. Ben Miller, University of Colorado Family Medicine Department	2013-2015
Legislative Aid	Colorado State Senator John Kefalas	2013-2015
Principal Investigator	A Qualitative Investigation of Barriers to Care for Operation Iraqi Freedom and Operation Enduring Freedom Veterans	2013-2014
Student Representative	The Colorado Medical Society Council on Legislation	2013-2014

Assistant to Staff	United States Congresswoman Betsy Markey	2008-2009
Intern Journalist	NBC News, Beijing bureau	2007

Invited Talks

Inter-individual differences in latent-state learning and generalization	NYU	2022
Learning to Ignore Irrelevant Details: A Latent-State Model of Generalization	The University of Minnesota	2021
Behavioral Mechanisms of Excitatory and Inhibitory Dysfunction in Autism	The Child Mind Institute	2020
Neural network models of multi-attribute choice behavior in autism	NYU	2019
Neural Circuit Mechanisms of Multi-Alternative, Multi-Attribute Decisions	NYU	2019
Decision Making: Apples and Oranges	Cambridge University	2019
Computational Models of Social Decision-Making	University of Pennsylvania	2018
Data Sufficiency in Neural Recordings of a Working Memory Task	Western University, London Ontario	2018

Conference Presentations

Goal-Directed Attention and Memory Vary with ASD, ADHD and Depressive Traits: Transdiagnostic Insights from a Novel Computational Model and Task Paradigm
Pettine, W.W., Redish, A. D., Jacob, S., Murray, J. D.
International Society for Autism Research, 2023

Combating Disinformation: Cognitive Mechanisms of Learning, Attention and Confidence
Pettine, W. W.
Intelligence Community Academic Research Symposium, 2022

Instrumental Learning and Generalization of Latent States Involves Prototype Formation with Discriminative Attention
Pettine, W. W., Dhruva R., Redish, A. D., Murray, J.D
Reinforcement Learning and Decision Making, 2022

Human Latent State Generalization Through Prototype Learning with Discriminative Attention
Pettine, W. W., Dhruva R., Redish, A.D., Murray, J.D
From Neuroscience to Artificially Intelligent Systems (NAISys), 2022

Human Generalization of Economic Choices Requires Learning of Prototype States With Dynamically Generated Decision Boundaries
Pettine, W. W., Dhruva R., Redish, A.D., Murray, J.D
Society for Neuroeconomics, 2021

Computational Models of Autism Spectrum Disorder: Learning What to Ignore
Pettine, W. W., Murray J. D.
International Society for Autism Research, 2021

Excitatory and Inhibitory Tone Shapes Decision Regimes in Hierarchical Neural Networks to Maximize Reward Across Environments
Pettine, W. W., Kenway, L., Murray J. D., Wang, X. J.
COSYNE 2020

Coding of Visual Stimuli and Attentional State Across Layers of Area V4
Pettine, W. W., Steinmetz, N. A., Moore, T.
COSYNE, 2017

Decoding V4 laminar population response during covert and overt attention
Pettine, W. W., Steinmetz, N. A., Moore, T.
FENS, 2016

V4 Laminar Population Response During Covert and Overt Attention

Pettine, W. W., Steinmetz, N. A., Moore, T.
Howard Hughes Medical Institute, Medical Fellows Meeting, 2016

Coexisting Primary Hyperparathyroidism and parathyroid hormone-related peptide producing epithelioid angiosarcoma causing malignant hypercalcemia
Pettine, W. W., Barnes, C.
American College of Physicians, 2014

Monkey Math: Linear Symbolic Addition by Macaques
Pettine, W. W., Moore, B., Livingstone M.
SFN, 2012

Spine stabilization with the Coflex artificial disc
Pettine, K., **Pettine, W. W.**
Asian Pacific Spine Arthoplasty Society, 2010

Professional Service

Cosyne Reviewer	2019, 2020, 2021, 2022
Ad Hoc Reviewer: Plos Computational Biology	2021
Ad Hoc Reviewer: Nature Neuroscience	2019
Ad Hoc Reviewer: Journal of Neurophysiology	2019
Ad Hoc Reviewer: eLife	2018
Curriculum Steering Committee, The University of Colorado School of Medicine	2012-2015