

WILSON(YANCHEN) WANG

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Research Interests

Computational Neuroscience, Computational Cognitive Science, Neuroimaging

Education

University of Rochester

B.S. Computer Science, Minor Mathematics

August 2019 – May 2023

Rochester, NY

Research Experience

Columbia University

Research Assistant (Supervisor: Liam Paninski)

February 2024 – Present

Paninski Lab

- Built towards a first foundation model for neural spiking data that can solve a diverse set of tasks across multiple brain areas. Self-supervised modeling approach for population activity in which the model alternates between masking out and reconstructing neural activity across different time steps, neurons, and brain regions.

Stanford University

Research Engineer (Supervisor: Feng Vankee Lin, Ehsan Adeli)

February 2023 – Present

CogT Lab

- Conducting research in computational visual neuroscience to reconstruct stimuli image from brain activity from fMRI data; exploring human visual cognition and brain region level semantic analysis.
- Discerned how facial expressions mirror human fatigue levels—an aspect crucial for assessing a patient’s mental state in clinical contexts; incorporated a Recurrent Video Transformer that supersedes traditional methods like statistical analysis or the Visual Analogue Scale, offering precise predictions of fatigue based on visual data we collected during cognitive training sessions; observed a strong correlation between reaction time and facial expression

Shanghai Jiao Tong University

Research Assistant (Supervisor: Ruyuan Zhang)

July 2023 – August 2023

CCNN Lab

- Explored the Forward Forward (FF) algorithm’s efficiency in standard regression tasks and enhanced its performance by unsupervised learning
- Explored prompt learning to Multi-Modal Vision-Language Models

University of Rochester

Undergraduate Researcher (Supervisor: Christopher Kanan)

August 2022 – May 2023

KLab

- Implemented modified back propagation on different neural network models for continual learning, mitigating catastrophic forgetting in incremental learning; extended the benefits of initialization to improve network fine-tuning

Publications

- **Decoding Visual Experience and Mapping Semantics through Whole-Brain Analysis Using fMRI Foundation Models**
Yanchen Wang, Adam Turnbull, Tiange Xiang, Yunlong Xu, Sa Zhou, Adnan Masoud, Shekoofeh Azizi, Feng Vankee Lin, Ehsan Adeli. Under review at *Nature Machine Intelligence*.
- **Towards a ”universal translator” for neural dynamics at single-cell, single-spike resolution**
Yizi Zhang, Yanchen Wang, Donato Jimenez-Beneto, Zixuan Wang, Mehdi Azabou, Blake Richards, Olivier Winter, International Brain Laboratory, Eva Dyer, Liam Paninski, Cole Hurwitz. Under review at *NeurIPS 2024*.
- **MMA: Multi-Modal Adapter for Vision-Language Models**
Lingxiao Yang, Ru-Yuan Zhang, Yanchen Wang, Xiaohua Xie. *CVPR 2024*.
- **Vision-based estimation of fatigue and engagement in cognitive training sessions**
Yanchen Wang, Adam Turnbull, Yunlong Xu, Kathi Heffner, Feng Vankee Lin, Ehsan Adeli. *Artificial Intelligence in Medicine*.
- **Fine-Tuning Neural Networks with Online Backpropagation**
Yanchen Wang, Christopher Kanan. Abstract accepted by IEEE: WNYISPW.

Work Experience

Digital Currency Group - Foundry

12/2021 - 12/2022

Software Engineer

New York, USA

- Developed REST API using Go and standardized on-chain data via Rosetta implementation for flow protocol.
- Designed staking architecture and built a multi-protocol wallet address verification package; enhanced CI/CD processes using Docker, YAML, and Makefiles, and implemented synthetic tests for API endpoints using Datadog.

Binance

March 2021 – Sep 2021

Intern at Binance Broker Team

Beijing, China

- Managed Binance Brokerage API documentation, resolving developer queries and bugs, and facilitated communications with major platforms, banks, and teams, offering specialized crypto exchange solutions to clients like ccxt.
- Developed Telegram Bots for VIP and Broker services, enhancing user engagement and support efficiency at Binance.

Teaching Experience

Teaching assistant for CSC266 - Frontiers in Deep Learning

Spring 2023

Technical Skills

- Languages: Python, Golang, Java, C/C++, SQL, \LaTeX , Solidity
- Tools: PyTorch, HuggingFace, Git, Scikit-Learn, Pandas, NumPy, fMRIPrep