Xinyue Wang

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Education

University of Pennsylvania Sept. 2021 – May. 2023
Master of Engineering in Bioengineering PA, US

- **Cumulative GPA**: 4.0/4.0, Top 5%
- **Coursework**: Applied Machine Learning, Deep Learning, Graph Neural Network, Interactive Fiction Generation

University of Pennsylvania Jan. 2020 – May. 2020
Exchange Student PA, US

- **Cumulative GPA**: 3.9/4.0, Top 5%
- **Coursework**: Microeconomics, Brain-Computer Interface, Medical Device Development

Shenzhen University Sept. 2017 – May. 2021
Bachelor of Engineering in Biomedical Engineering GD, CN

- **Cumulative GPA**: 3.7/4.5, Top 10%
- **Coursework**: Data Structures, Object-Oriented Programming, Python Programming, Scientific Computation, Probability and Statistics, Linear Algebra

Publications

- **Xinyue Wang** and Konrad Kording. Meta-learning causal discovery. *arXiv preprint arXiv:2209.05598*, 2022
- Richard D Lange, Jordan Matelsky, **Xinyue Wang**, Devin Kwok, David S Rolnick, and Konrad P Kording. Neural networks as paths through the space of representations. *arXiv preprint arXiv:2206.10999*, 2022 (Submitted to ICLR)
- **Xinyue Wang**, Shaohui Hou, Li Zhang, Linling Li, Zhen Liang, Zhiguo Zhang, and Gan Huang. The real time eeg phase locked feedback control for alpha amplitude and frequency regulation: An openbci implementation. In *2020 9th International Conference on Bioinformatics and Biomedical Science*, pages 65–70, 2020
- Siyao Huang, **Xinyue Wang**, and Xiaoling Fan. A new species of the genus sovia evans, 1949 from south central yunnan, china (lepidoptera, hesperiidae). *Zootaxa*, 4731(4):zootaxa–4731, 2020

Teaching Experience

Neuromatch Academy Deep Learning Program Jul. 2022 – Aug. 2022
Teaching Assistant CA, US

- Led and guided a pod of students in the three-week Deep Learning tutorials study
- Helped students design and develop their Deep Learning projects based on Object Detection.
- Managed and organized tutorials learning and communications with mentors.

Research Experience

Kording Lab
Nov. 2021 – Present

Student Researcher
PA, US

- Conduct **large complex system simulations and perturbation studies** on the MOS 6502 microprocessor (**including 3510 nodes**) to acquire nontrivial causal data
- Design and evaluate **meta-learning causal discovery procedure**, which leverages deep-learning to outperform human conceptual methods in large complex real-world systems, in a **data-driven** way.
- Collaborate with other researchers in the lab to explore **representation paths inside neural networks** and develop **instrumental variable learning algorithms** for causal inference.

Laboratory of Medical Informatics & Neural Dynamics
Sept. 2019 – Jan. 2021

Student Researcher
GD, CN

- Developed a **PyQtGraph based real-time visualization tool** for visualizing and storing brain signal on the host computer
- Developed a **multi-module C++ based real-time neural feedback system** on OpenBCI(the slave microcomputer) including modules of data processing, data storage, phase decoding, visual stimulus
- Designed and conducted comparison tests to quantify the intensity and depth of the alpha wave modulation, which was **improved 55.6%** compared to previous research

Projects

Sartorius - Cell Instance Segmentation Competition

- Performed **pertaining, finetuning, and semi-supervised learning** on different stages based on Cascade R-CNN, and developed unique **cascade IoU screening** to stably ensemble instance masks to acquire finer segmentation.
- Prototyped the **customized neurons mask post-processing pipeline** to better recognize different kinds of cells according to neurons' characteristics .
- **Kaggle Silver Medal Solution**; Achieved **34.5% mAP score** on private leaderboard, ranking **17/1559 (Top %1)**.

UW-Madison - GI Tract Image Segmentation Competition

- Performed **various training tricks** in 2D UNet and UPerNet with different backbones such as ConvNeXt and ViT, and combined it with 3D nnUNet to **fuse different receptive** to generate better organ segmentation in MRI.
- **Kaggle Silver Medal Solution**; Achieved **87.6% metric score** on private leaderboard, ranking **32/1548 (Top 2%)**.

Google - Hindi and Tamil Question Answering Competition

- Led teammates to collect external data and process long Hindi and Tamil texts and **transfer augmentations in computer vision into the natural language** to obtain better generalization.
- Conducted **multi-task pre-training and fine-tuning** based on XLM-RoBERTa, ensembled 16 models to reduce false positives in the answers to questions asked in Hindi or Tamil language.
- **Kaggle Silver Medal Solution**; Achieved **74.2% Jaccard score** on private leaderboard, ranking **39/959 (Top 4%)**

QBert - Query Embeddings using Contrastive Learning without Negative Samples

- Reviewed and evaluated different kinds of **text augmentation** methods to engineer an appropriate way of generating more valid queries that appeared in real-world user searching.
- Leveraged the finely selected augmentation methods and popular **contrastive learning frameworks** in computer vision that **do not require negative samples**, such as SimSiam, BYOL, to build a **small but effective query-specific encoder**.
- Examined on query pair comparison in Quora and online searching in MS MARCO, achieved **71.2% F1 score** with only a **43MB** encoder.

Skills

- **Language:** English (TOFEL 108, GRE 325+4), Chinese (Native)
- **Programming:** Python, Matlab, C++, C, MySQL
- **Tools:** Latex, Tableau, Adobe Illustrator, Git, Microsoft Office Suite, SPSS