

Mengzhan ‘Jhan’ Liufu

- Personal website: <https://jhanliufu.github.io/>

Education

- University of Chicago, BS, Computer Science; BA, Economics; BA, Physics
@ Chicago IL, 60637, Sept 2021 ~ Present
- The Affiliated High School of SCNU, High School Diploma
@ Guangzhou GD, China, Aug 2018 ~ June 2021
- Tungwha Middle School, Middle School Diploma
@ Dongguan GD, China, Sept 2015 ~ June 2018

Academic interests

Brain computer interface, system neuroscience; machine learning, data science, edge computing, embedded systems; wearable and implantable devices, bioelectronics, optogenetics.

Publications

1. **M. Liufu**, Z. Leveroni, S. Shridhar, N. Zhou, J. Yu#. (2024) “Optimizing real-time phase detection in diverse rhythmic biological signals for phase-specific neurostimulation.” *bioRxiv*. doi: <https://doi.org/10.1101/2024.08.24.609522> (under review at **J. Neural Eng.**)
2. **M. Liufu**, Z. Leveroni, S. Shridhar, N. Zhou, J. Yu#. (2024) “Evaluation and signal feature informed optimization of phase detection algorithms.” *Society for Neuroscience annual meeting*, Chicago IL (poster)
3. G. Wang, P. Toptas, N. Zhou, S. Shridhar, Z. Leveroni, A. Yang, H. Xu, **M. Liufu**, U. Mani, L. Chen, J. Proctor-Bonbright, J. Yu#. (2024) “Coordinated hippocampal-cortical beta oscillations in spatial and non-spatial learning”. *Society for Neuroscience annual meeting*, Chicago IL (poster)
4. J. Xu*, C. Yang*, **M. Liufu***, S. Chang, J. Chen, F. Lu, A. Hadjiosif, A. Haith, X. Deng, J. Chen#. (2023) “Effects of different feedback conditions on sensorimotor adaptation revealed in a mirror reversal paradigm.” *Journal of Behavioral and Brain Science*. doi: [10.4236/jbbs.2023.137009](https://doi.org/10.4236/jbbs.2023.137009), *equal contributors
5. X. Deng, C. Yang, J. Xu, **M. Liufu**, Z. Li, J. Chen#. (2023) “Bridging event-related potentials with behavioral studies in motor learning.” *Frontiers in Integrative Neuroscience*. doi: <https://doi.org/10.3389/fnint.2023.1161918>
6. X. Deng*, **M. Liufu***, J. Chen#. (2022) “Understanding implicit and explicit sensorimotor learning through neural dynamics.” *Frontiers in Computational Neuroscience*. doi: <https://doi.org/10.3389/fncom.2022.960569>, *equal contributors

7. H. Luo*, **M. Liufu***, D. Li. “Intelligent online food delivery system: a dynamic model to generate delivery strategy and tip advice.” *arXiv*. link: <https://arxiv.org/abs/2002.01713>, *equal contributors

Projects

HyperBCI: unsupervised domain adaptation and TinyML for self-calibrating brain computer interface

@ *Designing BCI models capable of unsupervised self-calibration and deploying the model on an FPGA-based neural implant in rodent brain.*

link: <https://jhanliufu.github.io/projects/hyperBCI.html>

DropConnect: linear bottleneck architecture for RRAM fault-tolerant deep learning

@ *Explored a potential method to improve the robustness of deep learning models against the hardware faults on RRAM accelerator.*

link: https://jhanliufu.github.io/projects/drop_connect.html

Barcoding and long-term tracking of individual cells using nitrogen-vacancy center as quantum sensor

@ *Identified and tracked living cells by resolving spatial orientations of NV centers as unique barcodes.*

link: https://jhanliufu.github.io/projects/cell_tracking.html

Phase-specific optogenetic stimulation and prefrontal-hippocampal coherence

@ *Optimized phase detection algorithms for phase-specific neurostimulation, and used the technology to understand prefrontal-hippocampal coherence.*

link: https://jhanliufu.github.io/projects/closed_loop_control.html

Neural correlates of implicit and explicit sensorimotor learning

@ *Investigated and theorized the interaction between implicit sensorimotor adaptation and explicit motor task learning.*

link: https://jhanliufu.github.io/projects/sensorimotor_adaptation.html

Honors & Awards

NK Cheung Chemistry Research Fellowship

@ *Department of Chemistry, University of Chicago • October 2024*

Fellowship in application of machine learning and artificial intelligence in biological and health sciences

@ *Biological Sciences Division, Research Computing Center, University of Chicago • June 2024*

The Training Program in Theory and Computation for Next Generation Neuroscientists

@ *Grossman Center for Quantitative Biology and Human Behavior, University of Chicago • November 2023*

Quad Faculty Research Grant

@ *University of Chicago • October 2023*

Quad Summer Undergraduate Research Scholar

@ *University of Chicago • May 2023*

Jeff Metcalf Fellowship

@ University of Chicago • October 2022

Data Science Institute Summer Research Scholar

@ Data Science Institute, University of Chicago • July 2022

2021-2022 Dean's List

@ University of Chicago • September 2022

Professional experiences

- Research intern

@ Henry Hoffmann's lab, Department of Computer Science, University of Chicago

February 2024 ~ Present

link: <https://people.cs.uchicago.edu/~hankhoffmann/>

- Research intern

@ Yanjing Li's lab, Department of Computer Science, University of Chicago

December 2023 ~ May 2024

link: <https://tianlab.uchicago.edu/>

- Research intern

@ Bozhi Tian's lab, Department of Chemistry, University of Chicago

August 2023 ~ Present

link: <https://people.cs.uchicago.edu/~yanjingl/>

- Research intern

@ Peter Maurer's lab, Pritzker School of Molecular Engineering, University of Chicago

August 2023 ~ March 2024

link: <https://maurer-lab.com/>

- Research intern

@ Jai Yu's lab, Institute for Mind and Biology, University of Chicago

October 2021 ~ Present

link: <https://voices.uchicago.edu/jaiyu/>

- Data science intern

@ HealthyPAI

October 2022 ~ December 2022

- Visiting student

@ Juan Chen's lab, School of Psychology, South China Normal University

March 2021 ~ September 2021

link: <https://psy.scnu.edu.cn/english/facultymember/teachers/juan%20chen/>

- Engineering intern

@ Fangjong Chen's lab, School of Communications, South China University of Technology

June 2019 ~ Oct 2019

Skills

- Programming: Python, MATLAB, Java, C, C#, Rust, SQL, TypedRacket. Familiar with Windows and Linux OS.
- Data science and machine learning: pytorch, tensorflow; numpy, scipy, scikit-learn, pandas; anaconda, jupyter notebook, Google Colab.
- Engineering: CAD with SolidWorks; Embedded systems with FPGA, hls4ml , Arduino, stm32, MSP430FR5994 (NI); PCB design, circuit welding, basic 3D printing, basic lithography.

Media

- Github personal page: <https://github.com/JohnLauFoo>
- LinkedIn personal page: <https://www.linkedin.com/in/jhan-liufu-97178122b/>
- Personal website: <https://jhanliufu.github.io/>

References

Dr. Henry Hoffmann, hankhoffmann@cs.uchicago.edu

Dr. Jai Yu, jauyu@uchicago.edu

Dr. Bozhi Tian, btian@uchicago.edu

Extracurricular activities / interests

Classical and Jazz music; Submission grappling, Brazilian JiuJitsu, Judo; Car racing