Yifan Zhang

Homepage Link
Email: zhangyifanedu@nudt.edu.cn
Mobile: (+86)17873553662
Changsha, Hunan Province, China

Education

Ph.D. Candidate – National University of Defense Technology Mar 2022 - Present

- **Major:** Control Science and Engineering, Cognitive Science Laboratory
- **Advisors:** Prof. Dewen Hu and Prof. Ling-Li Zeng
- **Research Interests:** Brain Science & Cognitive Neuroscience, Brain-Computer Interface

M.Phil. – National University of Defense Technology Sep 2019 - Dec 2021

- **Major:** Control Science and Engineering, Cognitive Science Laboratory
- **GPA**: 1.80/±3 (top 5%)

Bachelor – Harbin Institute of Technology Sep 2015 - Dec 2019

- **Major:** Information Security, National Key Lab of Computer Information Content Security
- **GPA**: 91.16/100 (top 5%)

Selected Publications

Co-Guidance Learning for EEG Channel Selection with State Space Modeling
Y. Zhang, Y. Yu, H. Li, A. Wu, Z. Chen, L.L. Zeng, D. Hu
[Under Review]

DMAE-EEG: A Pre-training Framework for EEG Spatiotemporal Representation Learning
Y. Zhang, Y. Yu, H. Li, A. Wu, X. Chen, J. Liu, L.L. Zeng, D. Hu
IEEE Transactions on Neural Networks and Learning Systems (TNNLS), 2025. [link]

MASER: Enhancing EEG Spatial Resolution with State Space Modeling
Y. Zhang, Y. Yu, H. Li, A. Wu, L.L. Zeng, D. Hu
IEEE Transactions on Neural Systems and Rehabilitation Engineering (TNSRE), 2024 [link]

Graph Learning with Co-Teaching for EEG-Based Motor Imagery Recognition
Y. Zhang, Y. Yu, B. Wang, H. Shen, G. Lu, Y. Liu, L.L. Zeng, D. Hu.
IEEE Transactions on Cognitive and Developmental Systems (TCDS), 2023 [link]

Splatflow: Learning Multi-frame Optical Flow via Splatting
B. Wang, **Y. Zhang**, Y. Yu, Z. Sun, L. Liu, D. Hu.
International Journal of Computer Vision (IJCV), 2024 [link]

M2DC: A Meta-Learning Framework for Generalizable Diagnostic Classification of Major Depressive Disorder
J. Su, B. Wang, Z. Fan, **Y. Zhang**, L. L. Zeng, H. Shen, D. Hu.
IEEE Transactions on Medical Imaging (TMI), 2024 [link]

Fusion of Spatial, Temporal, and Spectral EEG Signatures Improves Multilevel Cognitive Load Prediction
Y. Liu, Y. Yu, Z. Ye, M. Li, **Y. Zhang**, Z. Zhou, D. Hu, L.L. Zeng.
IEEE Transactions on Human–Machine Systems (THMS), 2023 [link]

Stablepose: Learning 6D Object Poses from Geometrically Stable Patches
Y. Shi, J. Huang, X. Xu, **Y. Zhang**, K Xu.
CVPR, 2021 [link]

Amphibious Vehicle's Resistance Optimization through Neural Networks and Genetic Algorithms
B. Liu, **Y. Zhang**, D. Pan, X. Xu, T. Cai.
Physics of Fluids, 2024 [link]

Patents

Motor Imagery Recognition Method Using Graph Neural Networks
Y. Yu, **Y. Zhang**, L.L. Zeng, D. H.
CN Patent ZL202210228171.4, granted Mar. 2024

Target Enhancement Interpretation Method and Device Based on Multi-brain BCI Systems
Y. Yu, G. Lu, **Y. Zhang**, et al.
CN Patent ZL202211211913.9, granted Aug 2024

EEG Data Repair Platform with Attention-based Computational Method
L.L. Zeng, **Y. Zhang**, Y. Yu, D. H.
CN Patent Application 202410273903.0, filed Mar. 2024

Data-driven EEG Channel Expansion System with Adaptive Selection Algorithm
Y. Yu, **Y. Zhang**, L.L. Zeng, D. H.
CN Patent Application 202411955772.0, filed Dec. 2024

Multi-modal EEG Analysis Platform Incorporating Self-supervised Pre-training Method
L.L. Zeng, **Y. Zhang**, Y. Yu, D. H.
CN Patent Application 202311732152.6, filed Dec. 2023

Internships

Huawei | **Beijing Research Institute** Jul 2021 - Oct 2021

- **Algorithm Intern**, Intelligent Automotive Solutions BU (IAS)
- Researched event camera-based perception algorithms for autonomous driving
- Developed depth estimation framework fusing event streams with RGB images

Meituan | **Beijing** May 2021 - Jul 2021

- **Algorithm Intern**, Drone Delivery Flight Control Group
- Built Flight Data Analysis System (FDAS) deployed in Shenzhen community
- Developed drone health management system for vibration anomaly detection

Baidu | **Beijing** Jan 2019 - Apr 2019

- **Test Intern**, Apollo Autonomous Driving Division
- Adapted and debugged Apollo Development Kit (Apollo 3.0)
- Created development documentation and provided technical support for product launch

Honors & Awards

- Gold Award | National Invention Exhibition & BRICS Skills Development Competition Dec 2024
- National 3rd Prize | 6th Huawei Cup China Graduate AI Innovation Competition (Team Lead) Sep 2024
- National 2nd Prize | Global AI Innovation Competition - UAV Challenge (Team Lead) Jun 2023
- National 1st Prize | Global AI Innovation Competition - Deep Learning Track Jun 2023
- National 2nd Prize | 9th Xindong Aviation Cup Future Aircraft Innovation Competition Jun 2023

- National 2nd Prize | 5th Shenhao Cup Robotics Innovation Design Competition Sep 2023
- National 2nd Prize | 4th Shenhao Cup Robotics Innovation Design Competition Sep 2022
- National 2nd Prize | 15th National Intelligent Vehicle Contest - Deep Learning Group Jun 2020
- National 1st Prize | 2nd China Formula Student Driverless Dec 2018
- Outstanding Student | Harbin Institute of Technology Dec 2018

Research Projects

Invasive/Non-invasive Bidirectional Closed-loop BCI Systems Aug 2022 - Present

- Supported by Science and Technology Innovation (STI) 2030 - Major Projects
- Contributed to grant proposal writing and technical reporting
- Proposed generative method for enhancing EEG spatial resolution, improving movement-related signal decodability
- Designed wearable cognitive headband prototype and cognitive state monitoring software system

Generative AI Methods for Cross-Site Multi-modal Brain Imaging and Diagnostic Applications |Jan 2025 - Present

- Supported by National Natural Science Foundation of China (NSFC) Key Project
- Designed self-supervised pretraining framework for EEG (100M parameters on 2000+ hrs unlabeled data)
- Developing EEG-graph-text cross-modal generative framework

Key Technologies for Brain-Machine Hybrid Intelligence Nov 2021 - Nov 2023

- Supported by National Defense Science and Technology Innovation Special Zone Project
- Integrated brain-controlled wheelchair system and conducted clinical tests at Xiangya Hospital

Human-Robot Intelligence Fusion Technology Jun 2019 - May 2023

- Supported by National Key Research and Development Program of China
- Proposed hybrid EEG-computer vision concealed object recognition (+10% accuracy vs vision-only)

Skills

- **Programming:** Python, C/C++, Java, MATLAB
- **Deep Learning:** PyTorch, TensorFlow (EEG signal processing)
- **Tools:** Git, Linux, Embedded Systems
- **Languages:** English (Professional Proficiency), Chinese (Native)

References

Prof. Dr. Dewen Hu [Website]
Professorship of Cognitive Science Laboratory
National University of Defense Technology, China

Prof. Dr. Lingli Zeng [Website]
Professorship of Cognitive Science Laboratory
National University of Defense Technology, China