

Yikai Si

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 yksi2023

Shanghai 200240, China

RESEARCH INTEREST

Broad interests in computational neuroscience, especially representation, learning, and dynamics in neural systems; applying machine learning tools to characterize and model these processes.

EDUCATION

- **Shanghai Jiao Tong University** *Shanghai, China*
B.S. in Physics
2023-2027(expected)
 - **Zhiyuan Honors Program** (top 10% selective honors program)
 - Tsung-Dao Lee Elite Class
 - GPA: 3.92/4.30 ; Average Score: 91.0/100

RESEARCH EXPERIENCE

- **Representational Drift of Artificial Neural Networks under Continual Learning** 2025.6–Present
Undergraduate Research Assistant, Computational Neuroscience Group | *Supervisor: Shanshan Qin* 
 - (Active since 2025.10) Built a 20-task class-incremental benchmark on TinyImageNet with pretrained ResNet-18 (froze early stages; fine-tuned layer3–4 and classifier) in PyTorch.
 - Implemented continual-learning baselines (fine-tuning, experience replay, EWC) under TIL/CIL evaluation; organized reproducible experiments with config-driven scripts and version control (Git).
 - Developed layer-wise drift metrics on a fixed probe set (mean cosine distance and mean L_2 distance) and computed model–model / sample–sample similarity matrices; visualized results with Matplotlib.
 - Preliminary results: replay/EWC reduce forgetting on earlier tasks, while late-layer representations still exhibit measurable drift across tasks.
- **DCI-LLM: Multimodal Few-Shot Prediction for Double Cone Ignition Laser Fusion** 2025.10-2026.1
Supervisor: Xiaohui Yuan, Jie Zhang
 - Built an experimental-data-driven multimodal model to predict peak plasma density timing under extremely few shots.
 - Fused laser power time series, diagnostic images, and text metadata; compressed sequences into tokens (Signal Digestor) for LLM-based reasoning.
 - Introduced cross-modal attention to align temporal tokens with frozen vision features
 - Outperformed Transformer/LSTM baselines and image-free ablations on real experiments (report MAE in ns).

SKILLS

- **Programming:** Python, PyTorch, MATLAB, Bash, HPC cluster usage (SLURM)
- **Presenting Tools:** L^AT_EX, Markdown, Slidev on VSCode

HONORS AND AWARDS

- **Zhiyuan Honors Scholarship** 2023,2024,2025
Zhiyuan College, Shanghai Jiao Tong University
 - Awarded to students in the Honors Program with outstanding academic achievement.

VOLUNTEER EXPERIENCE

- **Winter Scarf Donation Volunteer (annual)** 2023,2024,2025
Zhiyuan College Youth Volunteer Service Team
 - Coordinated materials distribution and collection within the volunteer group; knitted scarves donated to children in rural mountainous areas.

CERTIFICATIONS

- TOEFL iBT: 101 2025.2