

# LANG FENG

Email: [langfeng@zju.edu.cn](mailto:langfeng@zju.edu.cn)  
Website: <https://langfengq.github.io>

## EDUCATION

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### Master Student, Zhejiang University

Sep. 2021 - Mar. 2024

- Computer Technology, GPA: 91.1/100.0 (5%)
- Advisor: Prof. Gang Pan
- Coursework: Machine Learning, Computer Vision, Probability and Statistics in Data Analysis, Big Data, Artificial Intelligence, etc.

### B.Eng. (Hons.), Southeast University

Sep. 2017 - Jun. 2021

- Information Engineering, GPA: 3.79/4.00 (10%)
- CET4-635, CET6-490
- Advisor: A.P. Liang Wu
- Coursework: Probability Statistics and Stochastic Processes, Geometry and Algebra, Communication Theory, Fourier Analysis, Digital Image Processing, etc.

## RESEARCH INTERESTS

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- My research interests lie in developing efficient **reinforcement learning** (RL) algorithms, particularly in **multi-agent systems**, as well as exploring RL applications in other AI domains and real-world challenges.
- I also work on **spiking neural networks**, including combating spike-oriented gradient vanishing and optimizing network structure.

## PUBLICATIONS

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- **Bidirectional Distillation: A Semi Self-Play Framework for Multi-Agent Generalizable Behaviors**  
[Lang Feng](#), Jiahao Lin, Dong Xing, Li Zhang, De Ma, Shijian Li, Gang Pan  
Under review at AAAI 2024
- **FP3O: Enabling Proximal Policy Optimization on Cooperative Multi-Agent Tasks with Diverse Network Types**  
[Lang Feng](#), Dong Xing, Junru Zhang, Gang Pan  
Under review at NeurIPS 2023
- **Multi-Level Firing with Spiking DS-ResNet: Enabling Better and Deeper Directly-Trained Spiking Neural Networks**  
[Lang Feng](#), Qianhui Liu, Huajin Tang, De Ma, Gang Pan  
International Joint Conference on Artificial Intelligence (IJCAI) 2022 [[Paper](#)] [[Code](#)]
- **A Satellite Handover Strategy Based on MIMO Technology in LEO Satellite Networks**  
[Lang Feng](#), Yifei Liu, Liang Wu, Zaichen Zhang, Jian Dang  
IEEE Communications Letters 2020 [[Paper](#)]
- **Adacknet: ADaptive Convolutional KERNEL Transform for Multivariate Time Series Classification**  
Junru Zhang, [Lang Feng](#), Haowen Zhang, Yuhuan Wu, Yabo Dong  
European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML-PKDD) 2023, accepted.
- **Temporal Convolutional Explorer Helps Understand 1D-CNN's Learning Behavior in Time Series Classification from Frequency Domain**  
Junru Zhang, [Lang Feng](#), Yang He, Yuhuan Wu, Yabo Dong  
ACM International Conference on Information and Knowledge Management (CIKM) 2023, long paper, accepted.

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- **Joint Optimization Based Satellite Handover Strategy for Low Earth Orbit Satellite Networks**  
Yifei Liu, [Lang Feng](#), Liang Wu, Zaichen Zhang, Jian Dang, Bingcheng Zhu, Lei Wang  
IET Communications 2021 [[Paper](#)]
  - **Event-Based Multimodal Spiking Neural Network with Attention Mechanism**  
Qianhui Liu, Dong Xing, [Lang Feng](#), Huajin Tang, Gang Pan  
IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP) 2022 [[Paper](#)]
  - **Efficient Spiking Neural Network Design via Neural Architecture Search**  
Jiaqi Yan, Qianhui Liu, Malu Zhang, [Lang Feng](#), De Ma, Haizhou Li, Gang Pan  
Under review at Neural Networks

## SELECTED HONORS AND AWARDS

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- **Award of Honor for Graduate**, Zhejiang University 2022
- **Graduate of Merit/Tripe A graduate**, Zhejiang University 2022
- **Outstanding Undergraduate Student**, Southeast University 2021
- **Provincial Excellent Graduation Thesis**, Jiangsu Province 2021
- **CDEL Education Scholarship**, Southeast University 2020
- **Honorable Prize in Mathematical Contest in Modeling** 2020
- **Provincial First Prize in Contemporary Undergraduate Mathematical Contest in Modeling**, Jiangsu Province 2019

## PATENT

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- **A Handover Method Between LEO Satellites and Gateway Stations Based on Multiple-input Multiple-output Technology**  
Liang Wu, [Lang Feng](#), Yifei Liu, Zaichen Zhang, Jian dang  
ZL 201911153776.6, 2022

## RESEARCH EXPERIENCE

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- AdvanCed Computing aNd SysTem Laboratory** 2021 - present
- Enhance the generalizability of proximal policy optimization in multi-agent cooperative tasks while ensuring the theoretical monotonic policy improvement.
  - For end-to-end trained spiking neural networks, address the challenges of the gradient vanishing and network degradation, as well as optimize and design the network architecture to enhance performance.
- National Mobile Communications Research Laboratory** 2019 - 2021
- Modeled the communication between low earth orbit satellites and gateway stations, and developed handover strategy algorithms to optimize the communication in low earth orbit satellite networks according to different QoS requirements.
- Chien-Shiung Wu College, SEU** 2018-2019
- Implemented a low voltage ( $V_{DD} \leq 1V$ ) fully differential operational amplifier and used Simulink to conduct the behavior-level simulation of the whole circuit, incorporating various irrational factors.

## OTHER EXPERIENCE

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- Gomoku Game AI Based on Monte Carlo Tree Search** 2022
- TL;DR: Achieved human-level AI in the Gomoku game with the forbidden rule.
  - Adopt the Monte Carlo Tree Search algorithm, self-play reinforcement learning. Introduced the forbidden rule for the reward, add Dirichlet noises in each node, and adjust the temperature coefficient. [[PDF](#)] [[Code](#)]
- Two-Stage End-to-End High-Performance Fast Objective Detection** 2021

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- TL;DR: Implemented FasterRCNN with an expanded VOC 2007 dataset.
  - Reduce the computation overhead of proposal generation and realize end-to-end training with Region Proposal Network. Expanded the VOC 2007 dataset to verify the effectiveness of the model. [[PDF](#)] [[Code](#)]

### **Segmentation-Based Steel Surface Defect Detection**

2021

- TL;DR: Enhanced the UNet model, making it better suited for industrial steel surface defect detection.
- Addressed the issues of imbalance and small objectives in the industrial dataset through Transfer Learning and less down-sampling. [[Code](#)]