Lang Feng

+86 18851898939 | langfeng@zju.edu.cn | langfengQ.github.io

Summary: My research focuses on multi-agent reinforcement learning, particularly cooperative tasks and the extension of proximal policy optimization. I also work on spiking neural network, including combating spike-oriented gradient vanishing and optimizing the network structure. Previously, I have also worked on the communication optimization in the scenarios of low earth orbit satellite.

EDUCATION

M.Sc. Candidate, Zhejiang University — **Hangzhou, China**
Computer Technology, GPA: 3.92/4.00 — Sep. 2021 - Mar. 2024
Advisor: Prof. Gang Pan
Coursework: Machine Learning, Computer Vision, Probability and Statistics in Data Analysis, Big Data and Artificial Intelligence, etc.

B.Sc., Southeast University — **Nanjing, China**
Information Engineering, GPA: 3.79/4.00 — Sep. 2017 - Jun. 2021
Advisor: Prof. Liang Wu
Thesis: Research on Dynamic Event Recognition Based on Spiking Neural Network
Coursework: Probability Statistics and Stochastic Processes, Geometry and Algebra, Communication Theory, Fourier Analysis, Digital Image Processing, etc.

PUBLICATIONS

- **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]
- **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]
- **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]
- **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]

UNDER REVIEW

- **Title Anonymized for the Double-blind Submission**
  Lang Feng, Dong Xing, Junru Zhang, Gang Pan
  About multi-agent reinforcement learning, under review at ICML 2023
- **Title Anonymized for the Double-blind Submission**
  Jiaqi Yan, Qianhui Liu, Malu Zhang, Lang Feng, Haizhou Li, Gang Pan
  About spiking neural network, under review at CVPR 2023
- **Title Anonymized for the Double-blind Submission**
  Junru Zhang, Lang Feng, Zhaoshu Shi, Yabo Dong
  About time series classification, under review at IJCAI 2023

Selected Honors and Awards

- **Outstanding Graduate Student**, Zhejiang University 2022
- **Three Good Graduate Student**, 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

- **A Handover Method Between LEO Satellite and Gateway Station Based on Multiple-input Multiple-output Technology**
  Liang Wu, Lang Feng, Yifei Liu, Zaichen Zhang, Jian dang
  CN111065161B, 2022

Research Experience

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.

School of Information Science and Engineering, Southeast University 2018-2019

- Implemented a low voltage (VDD ≤ 1V) fully differential operational amplifier and used Simulink to conduct behavior-level simulation of the whole circuit, incorporating various irrational factors.

Other Experience

Gomoku Game AI Based on Monte Carlo Tree Search 2022

TL;DR: Achieved human-level AI in the Gomoku game with 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

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 the 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]