LIN HAIYUN

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Github: https://github.com/L1ghtly5848/DeepFM-CTR-PyTorch

Education Background

Jilin University|Bachelor of Engineering in Robotics Engineering Sept. 2021 – Jul. 2025

- **Awards:** School-Level Second-Class Scholarship & Cultural and Sports Activities Scholarship & Excellent Students of the College of Communication Engineering for Academic Year 2021-2022

Nanyang Technological University (NTU)|Master of Science in Computer Control and Automation
Aug 2025 – Present

Core Algorithm Projects

DeepFM-based Click-Through Rate (CTR) Prediction System|PyTorch Dec. 2025

- Independently implemented the **DeepFM** architecture from scratch to handle high-dimensional sparse feature interactions in recommendation systems.
- Processed and validated the model on the **Criteo industrial dataset (2M samples)**, managing the full pipeline from data cleaning to evaluation.
- **Optimization**: Applied **Log Transformation** and **StandardScaler** to resolve gradient explosion; utilized **Xavier Initialization** and **Weight Decay** to mitigate overfitting.
- **Results**: Achieved a stable **AUC of 0.7518**, demonstrating a solid grasp of neural network optimization and feature engineering.

Undergraduate Thesis: The State of Health Estimation for Lithium-ion Batteries Based on Differential Thermal Voltammetry and Voltage Singular Value Dual-Feature Fusion|TensorFlow
Sept. 2024 - Jun. 2025

- **Signal Analysis & Preprocessing**:
  - Implemented **Savitzky-Golay filters** for adaptive noise reduction of Differential Thermal Voltammetry (DTV) curves.
  - Extracted 6-dimensional time-frequency features (peak/valley voltages and values) from DTV curves to capture internal battery phase transitions.
- **Dimensionality Reduction & Feature Selection**:
  - Applied **Singular Value Decomposition (SVD)** on raw voltage and temperature data for principal component reconstruction and noise reduction.
  - Conducted **Pearson Correlation Analysis** to select 5 key features (F1, F3, F5, F7, F8) highly correlated with capacity degradation, effectively reducing computational complexity.
- **LSTM Model Architecture**:
  - Constructed a deep **LSTM neural network** optimized with **RMSprop** and **Spatial Dropout** to mitigate gradient issues and overfitting.
  - Built a robust pipeline converting 1D feature vectors into 3D tensors for sequential learning.
- **Validation & Performance**:
  - Validated on **NASA battery datasets** (#5, #6, #7, #18) under multiple train-test split ratios (5:5, 4:6, 3:7).
  - Achieved high precision with **RMSE and MAE below 1%** in most cases, successfully capturing the "capacity regeneration" phenomenon.

Autonomous Navigation & SLAM System via ROS|Python,Linux,LiDAR May. 2024

- Developed a mapping and navigation suite for a physical robot cart using **Robot Operating System (ROS)** on Ubuntu.
- Optimized laser beam collection and map accuracy through **Gmapping** (SLAM) and enhanced localization precision using **Adaptive Monte Carlo Localization (AMCL)**.

- Conducted extensive debugging and visualization using **Rviz** and **Gazebo** to ensure reliable autonomous obstacle avoidance.

Technical Skills

- **Programming**: **Python**, **C**, **Matlab**.
- **Deep Learning**: **PyTorch** (DeepFM), **TensorFlow** (LSTM), Scikit-learn.
- **Hardware** : Equipped with a **high-performance GPU laptop**, capable of independent execution of large-scale deep learning experiments.

Internship Experiences

State Grid Corporation of China, Zhejiang Taishun Branch Wenzhou, China
Intern, Operation and Inspection Department Jul. 2024 - Aug. 2024

- Analyzed equipment performance data and assisted in preparing 8 maintenance reports, contributing to a 20% reduction in potential downtime for key power transformers.

China Mobile Communications Group Co.,Ltd, Taishun Branch Wenzhou, China
Intern, Network Department Jul. 2023 - Aug. 2023

- Diagnosed network anomalies and contributed to 5 network upgrade plans, ensuring stable data throughput and troubleshooting hardware glitches.

Career Objective

- To pursue an Algorithm Engineer role specializing in machine learning and deep learning. I aim to leverage my solid foundation in sequential modeling (LSTM) and complex feature interaction (DeepFM) to solve real-world challenges. While deeply passionate about the recommendation and search fields, I am eager to apply my expertise in multi-modal data fusion and neural network optimization to cutting-edge research projects.