CHEN Liheng

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EDUCATION

Beijing Normal University **Sep. 2021 – Jun. 2025 (expected)**

Major: Artificial Intelligence

Core Courses: Calculus (95), Fundamental Physics (90), Linux Operating System (93), Database and Data Principles (91)

Awards: 2024 COMAP MCM F Prize; 2021–2022 BNU Second-class Scholarship (Top 40%)

ACADEMIC EXPERIENCE

The Power of Momentum: How to Win the Match with Data (2024 MCM Problem C) **Feb. 2024**

Team Leader

- Developed a model based on IG-LSTM to measure player momentum, and conducted Correlation Analysis and Stochastic Simulation to assess the impact of momentum swings on match flow
- Utilized an information entropy-based decision tree to extract key features driving momentum swings, and designed an ANN-driven Momentum Swing Prediction Model (MSPM) to forecast match dynamics
- Optimized the model's accuracy and generalizability by incorporating new features, fine-tuning the parameters, and testing it across various tournaments and sports, securing the F prize

Unsupervised Point Cloud-based 3D Model Reconstruction **May 2023 – Apr. 2024**

Research Assistant **(under the supervision of Professor Huang Shisheng)**

- Applied an unsupervised learning model for 3D reconstruction, integrating global shape priors and smooth indicator functions constrained by gradient domains
- Proposed a differentiable generation module to generate differentiable smooth indicator functions from a set of oriented points and developed a joint learning framework named NeuralIndicator
- Conducted extensive evaluations on various public synthetic and real-scan point cloud datasets, demonstrating significant advantages of our approach in surface reconstruction, even for input point clouds with complex topology structures and incompleteness or noise
- Co-published the results as the second author at the International Conference of Machine Learning (ICML) (paper name: *NeuralIndicator: Implicit Surface Reconstruction from Neural Indicator Priors)*

Construction of a speckle pattern model with paddy field characteristics **May 2022 – May 2023**

Research Assistant **(under the supervision of Professor Cai Yongqiang)**

- Utilized OpenCV to perform grayscale conversion, smoothing filtering, and edge enhancement on images, followed by region segmentation and extraction of morphological and textural features
- Extracted object edges using Sobel and Canny algorithms, and enhance effectiveness through subsequent optimization using morphological operations, Hough transform, and other optimizations
- Conducted statistical analysis on image features and boundaries to derive characteristic parameters, and enhanced the conformity between models and actual field shapes by model optimization and reaction-diffusion equation optimization

PROFESSIONAL EXPERIENCE

Vast.AI **Aug. 2024 – Present**

Algorithm Research Intern. Department of Technology and Engineering

- Led a project on estimating a camera's 3D position relative to the target object and simultaneously building a 3D model of the

object based on a series of input images

- Applied a diffusion model to add Gaussian noise to original images, followed by noise removal via sampling to achieve inverse reconstruction
- Rendered 2D images into 3D space to construct 3D features, and employed CNN to extract key features to train diffusion model's denoiser, increasing the precision of camera position estimation and object 3D construction

ABB (China) **Jul. 2024**

Algorithm Engineer Intern, Department of Digital Systems

- Fine-tuned YOLOv8 parameters to develop a surveillance video integration program for detecting indoor population changes, and configured 5 modes to provide air conditioning strategies based on population density
- Developed interfaces and standardized the database format for integration with the company's industrial software Zee600
- Optimized data updates, real-time writing, and data structure for the smart screen system, eliminating 80% of the manual steps and enabling staff to access real-time data from four modules with a single IP address modification

Xiamen Area of China (Fujian) Pilot Free Trade Zone Port Power Supply & Tech. Co., LTD. **Jan. 2024 – Feb. 2024**

System Engineering Intern, Department of Communications

- Contributed to the usability optimization of the EAM system by resolving attribute conflicts in equipment inventory management and implementing automated equipment model selection, significantly reducing user workload
- Contributed to the blueprint design of the project management system for Harbour Electric. Designed the data structure for project information tables, laying the groundwork for subsequent development
- Engaged in testing projects for the Geographic Information System for the power information in the Harbour region, optimizing various system functionalities

ADDITIONAL INFORMATION

Programming Skills: C/C++, Python, SQL

Languages: Mandarin (native), English (TOEFL 100+)

Hobbies: Piano, Sports (including basketball, swimming, cycling, fitness, etc.)