Junyi ZHANG

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EDUCATION

University of California, Los Angeles (UCLA) Sep.2024-Now

✧ Major: Electrical and Computer Engineering (MS)

University of Science and Technology Beijing (USTB) Sep.2020-Jun.2024

✧ Major: Computer Science (BS)

✧ GPA: **3.92/4** (Top 3/278)

RESEARCH EXPERIENCE

►**National Laboratory of Pattern Recognition (NLPR),** Feb.2023-Sep.2023
Institute of Automation, Chinese Academy of Science (CASIA)

Research Topic:

Docking Based on Protein Binding Pockets Similarity

Academic Supervisor: *Prof.* Shu Wu, *Prof. Qiang Liu*

✧ Related fields: **AI4Science, Data Mining, Graph Neural Networks, Diffusion Model**

✧ Incorporated similarity information of protein binding pockets into the molecular docking model, enabling transfer learning on diverse docking datasets, thereby enhancing model robustness and improving docking performance.

✧ Developed a modeling framework to extract similarity information from protein binding pockets. Proposed a heterogeneous graph representation comprising three types of nodes: molecule, motif, and subpocket, and employed graph neural networks to extract and process information from the graph.

►**Pattern Recognition and AI Technology Innovation Lab** May 2022-Jan.2023
University of Science and Technology Beijing (USTB)

Research Topic:

SAN: Structure-Aware Network for Complex and Long-tailed Chinese Text Recognition

Academic Supervisor: *Prof.* Xucheng Yin, *Prof.* Chun Yang

✧ Related fields: **Computer Vision, Optical Character Recognition (OCR)**

✧ Proposed a Structure-Aware Network (SAN) for complex and long-tailed character recognition by utilizing the hierarchical components information of the character.

✧ Auxilary Radical Branch (ARB) based on the tree modeling of the label is introduced, which enhances the structure awareness of visual features.

✧ Proposed a novel TreeSim method to measure the similarity of two characters, and propose a TreeSim-based weighting mechanism for ARB to further utilize the depth information in the hierarchical representation.

✧ Our code has been open-sourced on GitHub. GitHub URL: https://github.com/Levi-ZJY/SAN

PUBLICATION

Junyi Zhang, Chang Liu, Chun Yang*, **SAN: Structure-Aware Network for Complex and Long-tailed Chinese Text Recognition**, 17th International Conference on Document Analysis and Recognition (ICDAR 2023), published.

SCHOLARSHIP

- ✧ National Scholarship of China (Awarded to 0.2% of students nationwide)
- ✧ Champion's Scholarship at the University of Science and Technology Beijing (Top 1)
- ✧ University-Level First-Class Scholarship

SKILLS

- ✧ Proficient: Python, PyTorch, C, C++
- ✧ Familiar: Java, JavaScript, Verilog, Assembly, HTML

COMPETITIONS

►National AI Board Game Tournament

National 2nd Prize Jul.2022-Aug.2022

- ✧ Developed a PyTorch-based program for the board game EinStein würfelt nicht, utilizing reinforcement learning principles and the Monte Carlo Tree Search (MCTS) algorithm
- ✧ Built and optimized a deep learning model to predict action probability distributions and value functions, addressing challenges such as slow computation speed and floating-point overflow.

►MCM/ICM

Honorable Mention Feb.2022-Mar.2022

- ✧ Developed a forest management model to enhance carbon sequestration, leveraging logistic growth theory, differential equations, and advanced fitting techniques.
- ✧ Applied the model to the Greater Khingan Mountains, optimizing forest harvesting schedules using data-driven analysis and the Particle Swarm Optimization algorithm.

►Mathematics Competition of Chinese College Students

1st Prize in Beijing Dec.2021

- ✧ The competition included advanced problems in higher mathematics, linear algebra, and probability theory, designed to test contestants' mathematical thinking abilities and depth of understanding.

►Physics Competition of Chinese College Students

1st Prize in Beijing Nov.2021

- ✧ The competition included advanced problems in mechanics, thermodynamics, electromagnetism, optics, and relativity, designed to evaluate contestants' ability to analyze physical problems and apply mathematical modeling and computational skills.

►RoboCup

1st Prize May 2021-Jul.2021

- ✧ Implemented automatic control for the NAO robot using C++, integrating image data from robot vision and motion information from multiple sensors.

►Microcontroller Application Competition

3rd Prize Apr.2021-May 2021

- ✧ Developed an electric fan control system using C language and STM32 microcontroller. Integrated temperature and humidity sensors, human infrared sensors, and implemented advanced features leveraging external interrupts, PWM, and SPI communication.