Yingrui Ji

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Education Background

Chinese Academy of Sciences 2022.9 – 2026.6

- Machine Learning and Computer Vision Ph.D. Beijing

Institute of Computing Technology, CAS Dalian Ocean University Joint Training 2019.9 – 2022.6

- Computer Application Technology (High Performance Computing) Master Beijing/Dalian

Projects

Advancing Out-of-Distribution Detection through Data Purification and Dynamic Activation Function Design 2023.07 – 2023.12

In-Distribution (ID) noise in existing OOD datasets can lead to inaccurate evaluation of detection algorithms. We introduce multiple lower-noise data sets OOD-R (Out-of-Distribution-Rectified) to ensure that the evaluation of OOD detection algorithms is more accurate and reliable. It improved model accuracy by 2.5% and reduced false positives by 3.2%. Furthermore, we propose ActFun, which improves the stability of feature extraction and minimizes specificity issues. It improves the AUROC of the GradNorm method by 18.42% and reduces the FPR95 of the Energy method by 16.93%.

- Propose a lower-noise OOD-R data set to reduce noise and enhance data quality.
- The ActFun activation structure is introduced, which replaces traditional ReLU with versions of ReLU desired in various networks.

Research and Optimizing Implementation of a New Stencil Parallel Algorithm 2021.07 – 2022.06

Stencil is a common loop nested computing mode, which is widely used in many scientific and engineering simulation applications. This project improves the low parallel efficiency of Gauss-Seidel Stencil iteration of red-black sorting, and reduces redundant calculations. In the 1-dimensional performance diagram, the improved method has a maximum performance of 5.60 times that of the before-improvement; in the multi-core test, the improved performance is compared with that before optimization, and the highest speedup ratio is 3.91.

- Implements a parallel Gauss-Seidel-based tiled tessellation algorithm, generalized as a method for arbitrary problem sizes, tile sizes, and tile starting positions.
- A novel fine-grained placement scheme is proposed.

Designing an Emotion Design Approach with Perceptual Engineering and Deep Convolutional Generative Adversarial Networks in Social Robotics 2020.03 – 2020.08

Due to the complexity of the personal aesthetic and emotional perception process, this project trains the DCGAN model based on the artificially created social robot image dataset to automatically generate novel design images. Experimental results show that newly designed social robots tend to obtain positive aesthetic and preference evaluations, supporting designers to create new products innovatively and efficiently.

- A perceptual engineering-based approach to emotional design is proposed using deep convolutional generative adversarial networks.

Academic Paper

- **Yingrui Ji**, Yao Zhu, Zhigang Li, Jiansheng Chen, Yunlong Kong, Jingbo Chen, Advancing Out-of-Distribution Detection through Data Purification and Dynamic Activation Function Design[J]. IEEE Transactions on Circuits and Systems for Video Technology, 2023. (Under Review)

- Zijie Ding, **Yingrui Ji**, Yan Gan, Yuwen Wang, Yukun Xia, Current Status and Development Trends of Technology, Methods, and Application Fields of Human-computer Intelligent Interaction: Bibliometric Research, 2023. (available accept)
- Yukun Xia, **Yingrui Ji**, Yan Gan, Zijie Ding, Applying Ming furniture features to modern furniture design using deep learning. Artificial Intelligence, Social Computing and Wearable Technologies, 2023.
- Yan Gan， **Yingrui Ji**, Shuo Jiang, Xinxiong Liu, Zhipeng Feng, Yao Li, Yuan Liu, Integrating aesthetic and emotional preferences in social robot design: An affective design approach with Kansei engineering and a deep convolutional generative adversarial network, International journal of industrial ergonomics[J]. 2021.
- Shang H, Duan X, Li F, ……**Yingrui Ji** et al. Many-core acceleration of the first-principles all-electron quantum perturbation calculations. Computer Physics Communications[J], 2021.

Intern Experience

Qiyuan Lab Algorithm Intern 2023.07 – Present

We refine the four datasets, use the evaluation algorithm to reduce the noise in these datasets, and clear the ID data in the OOD data set to ensure that the evaluation results are more reliable.

- Responsible for small algorithm model optimization and datasets optimization for Out-of-Distribution Detection.

NXP Semiconductor Corporation Algorithm Intern 2022.07 – 2022.12

Complete the conversion of the eiq-deepview model in the eiq-toolkit into the form required by the user, which is convenient for the user's subsequent development, and at the same time output the model result in the form of a picture. Optimize the training code of eiq-toolkit, reduce redundancy, help the group train and test new project use cases and write test files, submit and solve bugs in the updated version of eiq-toolkit during the test.

- Convert commercial models, optimize training codes, and test new version use cases.

Awards

- The Tenth Blue Bridge Cup National Software and Information Technology Professional Talent Competition Liaoning Division 1st 2019.03
- The Ninth Blue Bridge Cup National Software and Information Technology Professional Talent Competition Liaoning Division 1st 2018.04
- The Eighth Blue Bridge Cup National Software and Information Technology Professional Talent Competition Liaoning Division 2nd 2017.04
- The 4th College Student Mobile Application Development Competition Provincial 2nd 2017.10
- 11th iCAN International Innovation and Entrepreneurship Competition Liaoning Division 3th 2017.09
- Second Class Scholarship for Parallel Software Group, Institute of Computing Technology, Chinese Academy of Sciences 2021.01
- Third Class Academic Scholarship of Parallel Software Group, Institute of Computing Technology, Chinese Academy of Sciences 2022.01
- Second Class Academic Scholarship of Dalian Ocean University 2022.01

Technical Skills

- Proficient in Python, C language, familiar with Linux basic commands, familiar with basic algorithms and data structures
- Familiar with machine learning, deep learning and its principles, familiar with deep learning framework PyTorch, familiar with common collaborative office tools Git
- Have a certain ability to read English literature