Zisong Wang

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PROFILE

- **A master's degree** in computer application technology (Graduating in 2024).
- **Research direction and interest:** Edge detection, Boundary detection, Semantic segmentation, Three-dimensional reconstruction, Machine learning, Deep learning.
- Rigorous logical thinking, good at research and analysis, proficient in academic writing, solid mathematical skills, with a sense of teamwork and experience in organizing scientific research work.
- Familiar with **Python, Pytorch,** Linux and LaTeX. Familiar with the basic deep learning network structure. Strong **mathematical** background.

EDUCATION

University of Chinese Academy of Sciences **09/2021-Current**
Master of Computer Application Technology | GPA:3.43/4.00
Major courses: Computer Algorithm Design and Analysis, Computer Architecture, Graph Theory and Network Algorithm, Machine Learning, Deep Learning, Image Processing and Computer Vision, Visual Information Learning and Analysis, Reinforcement Learning, Medical Image Analysis, Deep Learning and Natural Language Processing, etc.

Jilin University **09/2016-06/2020**
Bachelor of Mathematics and Applied Mathematics
Major courses: Mathematical Analysis, Advanced Algebra, Graph Theory, Abstract Algebra, Probability Theory and Partial Differential Equation, etc.

PUBLICATION

08/2023 **Zhenyu Yin, Zisong Wang, Chao Fan, Xiaohui Wang, Tong Qiu. "Edge Detection via Fusion Difference Convolution." Sensors 23.15 (2023): 6883. (**SCI Q2)
（Due to school requirements, professor Zhenyu Yin must be the first author of the paper)

- In order to improve the accuracy and speed of edge detection, propose four new fusion difference convolution (FDC) structures that integrate traditional gradient operators into modern CNNs.
- Propose an oblique FDC to improve oblique edge recognition in complex background noise.
- The model exhibits good generalization ability and performs well on untrained datasets.

12/2022 **Zhenyu Yin, Zisong Wang, Ruifeng Guo, etc. "Method and device for detecting the edge of the surface guide rail steel plate protective cover"** (Patent number: 202211568856.X.)

- Based on VGG16, the network structure is modified and gradient information is introduced.
- Modify the loss function to the dice coefficient equation to obtain a refined image of the refined edges.

10/2023 **Zhenyu Yin, Xiaohui Wang, Feiqing Zhang, Dan Feng, Zisong Wang. "MP-NeRF: More Refined Deblurred Neural Radiance Field" Knowledge-Based Systems.** (In submission)

- A 3D reconstruction method designed for blurry images. Enhance the model's ability to understand blurred images using a Multi branch Fusion Network (MBFNet) and a Prior based Learning Network (PLW).

08/2023 **Tong Qiu, Zhenyu Yin, Jun Wang, Zisong Wang. "Research on Real-Time Linux Task Scheduling Algorithm for Multiprocessors Based on Particle Swarm Optimisation" 2023 IEEE the 9th International Conference on Computer and Communications (ICCC)** (In submission)

- Particle swarm optimisation algorithm is used to make improvements in task scheduling for Linux systems and RTAI kernel patches are used to improve Linux real-time.

RESEARCH EXPERIENCE

10/2023 **Compilation of Machine Learning Textbook**

- Participated as a member of the group in writing machine learning textbook, mainly responsible for writing the chapter on "Basic Process of Machine Learning".

10/2022-Current **Research and Application of Key Technologies for Real-time Fault Diagnosis of Intelligent Production Line of Industrial Internet of Things. National Key R&D Program (2017YFE025300)**

- As a team member, participate in projects undertaken by the laboratory. Implement specific fault detection of machine tool moving components.

09/2022 **Implementation of Key Point Detection (Human Posture Estimation) Model**

- Use YOLO-v8 to pre train key point detection, perform inference prediction on real-time camera images, analyze the prediction results of 17 human key points, and visualize the prediction results. Different sizes of pre trained models correspond to different trade-offs in speed and accuracy.

05/2022 **30 types of fruit classification projects based on real-time images**

- Using the deep learning framework Pytorch, based on the ImageNet pre trained image classification model (Resnet18), transfer learning and fine-tuning training were conducted on one's own 30 types of fruit image classification dataset to obtain one's own image classification model.

05/2022 **Analysis of consensus mechanisms for public and alliance chains in blockchain**

- This project is part of the blockchain curriculum, analyzing three consensus mechanisms in the shared chain: PoW, PoS and Algorand, as well as three consensus mechanisms in the alliance chain: PBFT, Ripple and Libra.

12/2021 **Implementation of Significant Object Detection Based on Deep Learning**

- Using the U2-Net model to achieve saliency target detection on the public dataset DUTS.

01/2021 **Implementation of a translation robot based on seq2seq**

- A machine translation model was implemented based on Attention Mechanism and LSTM.

05/2020 **A Review of Several Proving Methods for Darboux Theorem**

- Undergraduate graduation project, discussed three proof methods for Darboux Theorem, and provided generalizations and applications in high-dimensional situations.

HONOR & AWARD

10/2022 "Huawei Cup" China Graduate Mathematical Modeling Competition **National Second Prize**
Title: On the scientific management of daily necessities during the epidemic

05/2018 Jilin Province College Student Mathematical Modeling Competition **Provincial First Prize**
Title: Special Clothing Design for hot environment

REFEREES

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