Junjun Yan

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Education

National University of Defense Technology (NUDT) Sep 2021 – Jun 2024

Master, Major of Computer Science, College of Computer Science Changsha, China
Outstanding Student, Second-class Scholarship, Second-class Scholarship for Freshman
Related Course: Deep Learning Methods and Practices, Machine Learning, Parallel Algorithm

China Agriculture University (CAU) Sep 2017 – Jun 2021

Bachelor, Major of Computer Science, College of Information and Electric Engineering Beijing, China
GPA: 3.60 / 4.00, Scholarship for Outstanding Student, Second-class Scholarship, Merit Student
Related Course: Artificial Intelligence, Algorithms Analysis and Design, Digital Image Processing

Research Experience

AI Enabled PDEs Solving Method Based on National Supercomputer Nov 2022 – Present

Laboratory of Digitizing Software for Frontier Equipment Changsha, China

1. **Improved Physics Informed Neural Networks by Incorporating Self-training Mechanism**
   - Proposed ST-PINN, a pseudo label based self-training framework for training PINNs
   - Designed a strategy for pseudo-label generation to control the quantity and quality of pseudo points
2. **Enhanced Physics Informed Neural Networks by Combining Multi-task Learning Algorithm**
   - Implemented five distinct multi-task learning network structures within a physics-informed framework
   - Introduced the gradient cosine similarity algorithm to control the gradient direction of PINNs training

Development of Grid Point Distribution Intelligent Control System Jul 2022 – Oct 2022

China Aerodynamic Research and Development Center Mianyang, China

1. **Accelerated Aerodynamic Design Optimization Based on Graph Convolutional Neural Network**
   - Proposed a novel GCN-based CFD framework called GCF
   - Designed a specific GCN architecture for aerodynamic design optimization
2. **Improved Structured Mesh Generation Method Based on Physics-informed Neural Networks**
   - Formulated the mesh generation task as an optimization problem related to PINNs
   - Employed an auxiliary line strategy to offer a priori knowledge for network training

Efficient Value Compression Storage Format for Sparse Matrix Sep 2021 – Jun 2022

Science and Technology on Parallel and Distributed Processing Laboratory Changsha, China

- Proposed CSR&RV storage format, which saves each different value once
- Employed the index compression method, which further reduced the memory space
- Evaluated the throughput, memory space, scalability, and pre-processing in CSR&RV and other formats

Cow Individual Identification Based on Video Surveillance Feb 2019 – Feb 2021

Group Leader in the Undergraduate Research Program of CAU Beijing, China

- Employed OpenCV to process the video data, produce and augment the dataset
- Proposed a 2-ways CNN based on VGG and ResNet, which improved the accuracy by nearly 10%
- Developed web applications based on C# ASP.Net MVC architecture and deployed them to the server

Honors and Awards

Grand Prize, NUDT Postgraduate Symposium on Innovation of Sci. & Tech. (Best Presentation) Jun 2022
Finalist, Interdisciplinary Contest in Modeling (International Contest, Group Leader, Top 2%) Apr 2020
2^{nd} *Prize*, Blue Bridge Cup Programming Competition of Beijing (C++ Programming) Oct 2020

Internship Experience

China Aerodynamic Research and Development Center (CARDC) Jul 2022 – Oct 2022

Co-I, CFD Software Room, General Technology Department Mianyang, China

- Implemented feature extraction algorithms for unit features, point clouds, and graph structures
- Designed quality algorithm of grid point distribution based on the graph convolutional deep neural networks
- Developed the front-end and back-end modular, then embedded them into the CFD software

Representative Publications

Accepted Papers:

- **J. Yan**, X. Chen, Z. Wang et. al. ST-PINN: A Self-Training Physics-Informed Neural Network for Partial Differential Equations. International Joint Conference on Neural Networks, IJCNN2023
- **J. Yan**, X. Chen, and J. Liu. CSR&RV: An Efficient Value Compression Format for Sparse Matrix-vector Multiplication. International Conference on Network and Parallel Computing, NPC2022
- T. Li, **J. Yan**, X. Chen et. al. Accelerating Aerodynamic Design Optimization Based on Graph Convolutional Neural Network. International Journal of Modern Physics C (Co-first Author, 1st is the Co-Advisor)

Under Reviews:

- X. Chen, **J. Yan**, M Jia et. al. An Improved Structured Mesh Generation Method Based on Physics-informed Neural Networks. Engineering Computations

Work, Volunteering & Extracurricular

Undergraduate Teaching Assistant in NUDT Feb 2022 – Jun 2022

C++ programming, Major of Computer Science Changsha, China

- Hosted the Q&A sessions, helped students debug during class
- Taught exercise classes, designed the programming problems for quizzes and final exam

Summer Social Practice in CAU Aug 2018 – Sep 2018

Member, Group of Precision Poverty Alleviation Chongqing, China

- Visited, investigated the living conditions of residents, distributed and collected questionnaires
- Wrote a report to help the government understand the actual situation of residents

Volunteer Service Corps in CAU Oct 2017 – Apr 2019

Member and Undersecretary, Public Relations Department Beijing, China

- Established regular contact with social organizations, public welfare teams, communities, and enterprises
- Developed volunteer practice platform, established resource library, incubated volunteer service projects

Miscellaneous

- **Skills:** C/C++, C#, Python, Pytorch, TF 1.x, TF 2.x, Paddle, MPI, OpenMP, AVX512
- **Certifications:** National Second-level Athlete of Go Game
- **Interests:** Go, Marathon, Swimming