Yizhuo Zheng

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EDUCATION

PEKING UNIVERSITY   Beijing, China   09/2021–present
School of Mathematical Sciences

- Major in Computational Mathematics
- Programming skills: Proficiency in C++/Matlab/Python (Tools: CUDA; DSL:Triton/Latex/CMake)
- Coursework: Mathematical Analysis(I,II,III), Ordinary Differential Equation, Complex Variable Functions, Probability Theory, Data Structures and Algorithms, Optimization Methods, Fundamentals of Parallel and Distributed Computing, Programming in Artificial Intelligence, Mathematical Introduction to Machine Learning,Algorithms in Big Data Analysis

SCIENTIFIC RESEARCH EXPERIENCE

Supervisor: Tong Yang, Associate Professor, EECS, Peking University   05/2023-05/2024

- Use Elastic Sketch to improve the classic KLL algorithm to achieve better quantile estimation in streams
- Model distributed training traffic in the network, using the gaps to perform some active network measurements (ping) to avoid conflict with training traffic

INTERNSHIP EXPERIENCE

Finite Element Industrial Software and Numerical Analysis Laboratory Project   05/2023-05/2024

- Researched on the recommendation system for users' preferences for selecting formulas
- Conducted the code testing on the library of numerical integration functions and corrected the errors of numerical and code errors.
- Gained a grasp of Trilinos and reproduced the numerical methods used by Trilinos

Large Language Model Inference Optimization Group in Baichuan AI   06/2024-present

- Researched on how to use Triton for parallelized inference processes in OpenAI
- Use Triton for the development of the inference part of the large language model

SELECTED COURSE PROJECT

Mathematical introduction to machine learning

- Reproduced the results of the paper for transformer models using the AdamW optimizer. Examined the impact of data fraction
- Investigated the grokking phenomenon for models LSTM and MLP
- Analyzed the impact of different optimizers and regularization methods

Fundamentals of Parallel and Distributed Computing

- Used MPI,Open and MP,CUDA to implement parallel computing to accelerate serial code

Programming in AI

- Used the convolutional network in PyTorch to complete the image classification of the Mnist dataset
- Realized data parallelism and model parallelism based on PyTorch
- Designed algorithms for CNN and used pybind11 to encapsulate the code into Python code.
- Completed the image classification of the Mnist dataset with the self-implemented framework.

Optimization method

- Solved the group LASSO problem using CVX by calling different solvers mosek and gurobi.
- Utilized Matlab to implemented the Subgradient method, Proximal gradient method, Fast proximal gradient method, Augmented Lagrangian method, Alternating direction method, Alternating direction method

Numerical algebra

- Solved Numerical solutions to Stokes' equations using the V-cycle multigrid method, Uzawa Iteration Method, and Inexact Uzawa Iteration Method respectively

Introduction to Applied Mathematics

- Solved a simple second-order ordinary differential equations with one-dimensional finite element method
- Improved and generalized one-dimensional finite element method, adaptive finite element method and the two- dimensional finite element method are obtained, respectively

EXTRACURRICULAR ACTIVITIES

Class 5 of Grade 2021, School of Mathematical Sciences, PKU	*Monitor*		09/2021-present
Office of Student Work, School of Mathematical Sciences, PKU	*Student Assistant*		09/2023-02/2024