Liancheng Fang

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Education

M.S. in Biomedical Data Science   **Madison, WI**
Department of Biostatistics and Medical Informatics, University of Wisconsin-Madison   *2019/05 - 2022/01*
Advisor: Professor Yin Li

Selected courses: Nonlinear Optimization, Probability, Intro to Algorithms, Advanced Topics in Learning Theory

M.A. in Mathematics   **Madison, WI**
Department of Mathematics, University of Wisconsin-Madison, GPA:3.8/4.0   *2018/08 - 2019/05*
Selected courses: Theory of Machine Learning, Intro to Artificial Intelligence, Topics in Applied Mathematics, Integer Optimization

B.S. in Mathematics and Applied Mathematics   **Guangzhou, China**
Department of Mathematics, Sun Yat-sen University, GPA:3.5/4.0   *2014/09 - 2018/07*

Work Experience

United Sensing Technology（Computer Vision Engineer-Autonomous Driving）

2022/05-present

- Access, validate and optimize the perforance of BEV model for 3D object detection on zero-shot robustness.

- Implement and optimize the performance of self-supervised depth estimation model for fast inference using lightweight transformer.

- Collaborating with other research team to perform experiments on sensor fusion.

Projects

Meta-learning contrastive representation for few-shot learning
UW Computer Vision group   *2020/09-2021/12*

- Conducted experiments which empirically verified the effectiveness of contrastive learning for few-shot learning.

- Conducted experiments to use several meta-learning approaches to fine-tune representations learned from contrastive learning, which further improve the performance.

- Develop theory to explain the above empirical finding based on a latent concept assumption.

A Riemannian optimization approach for Canonical Correlation Analysis
UW Computer Vision group   *2020/01-2020/06*

- Re-parametrize CCA problem as optimization problem on several specific matrix manifolds which has provable same optimum as original problem.

- Derive a riemannian stochastic gradient descent algorithm that achieve improved time complexity and comparable convergence rate compared to existing related work.

Fully tensorized Neural Network
UW Computer Vison group   *2019/03-2019/12*

- Investigated traditional and modern types of Tensor Decompositions.

- Develop novel algorithms for approximate non-linear tensor arithmetics(e.g. ReLU).

- Investigated the performance of a fully tensorized neural networks compressed by Tensor Train decomposition in which all forward/back propagation is in Tensor Train space.

- Achieved comparable accuracy with vanilla VGG on Imagenet but with much less number of parameters.

Hybrid methods for well-mixed chemical reaction systems
Undergraduate research   *2018/01-2018/06*

- Investigated stochastic and deterministic methods for well-mixed chemical reaction systems.

- Proposed a hybrid method which combining Gillepie's SSA with deterministic ODE method, obtained superiority in both efficiency and accuracy compared to traditional methods.

Teaching Experience

Teaching Assistant
ECE/CS 761:Mathematical Foundations of Machine Learning, Instructor: Prof. Ramya Korlakai Vinayak Spring 2021
Department of Electrical & Computer Engineering, University of Wisconsin-Madison

Teaching Assistant
Math234:Calculus - Functions of Several Variables, Instructor: Prof. Omer Mermelstein   *Fall 2020*
Department of Mathematics, University of Wisconsin-Madison

Grader
Math714: Computational Math I, Instructor: Prof. Nan Chen   *Fall 2018*
Department of Mathematics, University of Wisconsin-Madison

Skills

- **Programming Languages:** Python, C/C++, Java
- **Library:** Pytorch, Tensorflow, scikit-learn
- **Others:** CUDA, SQL, LaTeX, R, Matlab, Git, GCP, Slurm

Talk

Hybrid methods for well-mixed chemical reaction systems, undergraduate symposium, April 13, 2018, University of Wisconsin-Madison.

Contrastive learning for few-shot learning, Biostatistics and Medical Informatics Seminar, December 10, 2021, University of Wisconsin-Madison.