Hao Liang

Curriculum Vitae

PERSONAL DETAILS

Birth	January 20, 2001
Address	Beijing, China
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ABOUT ME

Research Machine Learning & Computational and Applied Mathematics
1)Solving partial differential equations with Machine Learning.
2)To be answered.

Anyone who is interested in my research and have solid mathematics background or strong programming ability, please feel free to contact me.

EDUCATIONS

Ph.D. Student. Data Science 2023-present
Peking University, Center for Data Science (Supervisor: Weinan E)

Visiting Student. Mathematics & Computer Science 2022-2023
University of Oxford, Wadham College & Mathematics Institute & Department of CS
He took 6 Computer Science tutorials and learned another 12 classes in Math and CS.

BSc. Information and Computing Science 2019-2023
Beijing Institute of Technology
In his bachelor's degree he got a GPA of 92.5/3.85. Ranked 1 when applying his Ph.D..
He is the only person who represented BIT to attend the national final, Chinese Mathematics Competition in two consecutive years.
Graduation thesis supervised by Prof.Weinan E.

Academic education in Middle school 2013-2019
The Experimental High School Attached to Beijing Normal University

RESEARCH EXPERIENCES

Mitacs Research Intern Summer 2022
University of British Columbia, ECE Department (Supervisor: Xiaoxiao Li)
He read papers about continual learning, coreset as well as NTK model and wrote reports.
He also did some further research on continual learning by changing loss function and do derivation of the formula.

Research Intern Spring 2022
The Chinese University of Hong Kong, CSE Department (Supervisor: Yu Li)

Firstly, he read several papers about bioinformatics(AI) and wrote reports. In addition he recurrences the code of the MSA-transformer. He also learned how to run python on Linux and install the correct requirements.

Research Intern Winter 2022

North Carolina State University, CSC Department (Supervisor: Edward Gehringer)

In this research intern, he used Natural Language Processing(NLP) models to extract features from sentences. Also he tried to do some auto-grading works by comparing semantic similarity and completed a paper.

Research Intern Summer 2021

North Carolina State University, (Supervisor: Xu Wu)

In this research intern, he used generative adversarial network(GAN) as well as WGAN and WGAN-GP to generate data for the professor. Also he learned about the theory of WGAN.

PROJECTS

Mathematics Modeling Project Winter 2022

Beijing Institute of Technology

In this project, he used matrix decomposition to solve the Netflix problem. He proved the gradient decent model for optimizing the Netflix problem and used python to program and got good results.

Optimization Project Fall 2021

Beijing Institute of Technology

In this project, he used matrix decomposition to solve the Netflix problem. He proved the gradient decent model for optimizing the Netflix problem and used python to program and got good results.

Data Science Project Summer 2020

North Carolina State University (Supervisor: Dr. Majed Al-Ghandour)

In this project, he used python to do prediction of stocks and used Tableau to do visualization. He got 100 points in the final presentation.

WORK EXPERIENCES

SKILLS

Languages	Chinese (mother tongue)
	English (fluent)
Programming	Python, C, C++, Scala
Software	Matlab, SPSS, R
Frameworks	Pytorch, Keras
Other Skills	LaTeX, Tableau

COURSE BASIS

Pure Mathematics:

Linear Algebra, Matrix Analysis, Abstract Algebra, Analysis, Real Analysis, Functional Analysis, Measure and Probability, Complex Analysis, ODE, PDE, Discrete Mathematics,

Analytic Geometry, Differential Geometry, General Topology, Fuzzy Mathematics.

Applied Mathematics and Computational Mathematics:
Numerical method, Numerical Solution of PDE, Finite Element Method, Optimization, Financial Mathematics.

Statistics and Data Science:
Machine Learning (Statistical Learning Methods), Probability, Mathematical Statistics, Application of Stochastic Process, Applied Regression Analysis, Time Series, Information Theory, Probability and Computing, Theory of Deep Learning, Algorithm Foundation of Learning.

Computer Science:
Data Structure, Algorithm, Data Base, Concurrent Programming, Computer Graphics, Computational Complexity.

Artificial Intelligence:
Machine Learning, Advanced Topics in Machine Learning, Deep Learning, Natural Language Processing, Computer Vision (AI), Deep Learning in Healthcare, Geometric Deep Learning, Computational Learning Theory, Reinforced Learning.

Physics:
Mathematical Physics Method

Language Courses:
TOEFL (115), Introduction to Academic Writing and Language.

AWARDS

2019-2023 Feizhenyong Scholarship(The highest scholarship of mathematics department)
2021-2022 Globalink Research Internship Award (UBC & CSC & Mitacs)
2021-2022 1st Prize/Beijing Division, Chinese Mathematics Competition(ranked 17th)
2020-2021 2nd Prize/National Final, Chinese Mathematics Competition(ranked 28th)
2020-2021 1st Prize/Beijing Division, Chinese Mathematics Competition(ranked 104th)
2020-2021 Diwen Scholarship(1/500)
2020-2021 Huanyu Scholarship
2021-2022 Merit Student
2020-2021 Merit Student
2019-2020 Merit Student
2019-2020 National Scholarship(8/500)
2019-2020 1st Prize/BIT Mathematical Modeling Contest(10/300)

PUBLICATIONS