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Chi Zhao (Vector)

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Education

Saint Petersburg State University — Sept. 2021 – Jun. 2025
PhD in Applied Mathematics and Control Processes — *Saint Petersburg, Russia*
Thesis Title: "Modeling of binary opinion dynamics in social networks of complex configurations" — *Defended in Apr. 2025*

Saint Petersburg State University — Sept. 2019 – Jun. 2021
M.S. in Applied Mathematics and Informatics (GPA: 4.9/5.0) — *Saint Petersburg, Russia*

Beijing Institute of Technology — Jul. 3 – 28, 2017
ACM Summer Camp — *Beijing, China*

Yanan University — 2015 – 2019
B.S. in Computer Science (GPA: 3.1/4.0) — *Yanan, China*

Working Experience

Huawei Inc. — Sep. 2021 – Present
Researcher — *Saint Petersburg, Russia*

Wisedu Inc. — Sep. 2016 – May. 2019
Software Engineer — *Yanan, China*

Project Experience

Russian Science Foundation Grant No. 22-21-00346 — 2023
Researcher — *Saint Petersburg, Russia*

***Professional model data governance/Valuable training data selection (ongoing)** — 2025
Researcher — *Saint Petersburg, Russia*
This project focuses on improving the model performance through data governance and valuable feature / training data selection.

***Internal columnar storage algorithm** — 2023–2024
Researcher — *Saint Petersburg, Russia*
High-performance, highly flexible columnar storage lossless compression algorithm
The algorithm will be commercialized to store base station data.
LTE (4G) data 30% CR, NR (5G) data 40% CR, without loss any performance.

***Elastic expansion algorithm for internal distributed file storage systems** — 2023
Researcher — *Saint Petersburg, Russia*
Enabled seamless HOFS multi-node expansion using HRW Hashing with minimal data movement and no performance loss.
Improved system reliability by ensuring data access continuity even after hash ring loss.

***Packet/Router data compression** — 2023
Researcher — *Saint Petersburg, Russia*
This project achieved 85% CR without loss (Save 7x disk usage).

***Wireless data compression** — 2021–2022
Researcher — *Saint Petersburg, Russia*
This project achieved 96% CR through lossy compression.

***SparkSQL query optimization** — 2021
Researcher — *Saint Petersburg, Russia*
This project speeds up query execution by 50% through predicate pushdown and optimization of data structures.

Fast calculation of massive high dimensional vector similarity — May 2018 – Aug. 2018
Algorithm Engineer — *Yanan, China*
This project improves the efficiency of the nearest neighbor algorithm and won the 3^{rd} prize in the China Software Cup 2018.

Online news classification system based on CNN Mar. 2018 – May. 2018
Full Stack Engineer *Yanan, China*

This project has obtained a Chinese software registration certificate.
This project won the 3rd prize in the Computer Design Competition 2018.

Patent / Copyright Certificates

A program for modeling the opinion dynamics in two-layer networks 2023
Russian Computer Software Copyright Registration Certificate *NO. 2023661532*
Online News Classification System Based on Convolutional Neural Network 2018
Chinese Computer Software Copyright Registration Certificate *NO. 2831192*

Open Source Projects

ShapG | *python · feature importance algorithm · centrality measures*
- A Python package for feature importance algorithms based on Shapley values.
- This package can also be used to calculate the centrality in the graph.

News Classification | *python · NLP · CNN · text classification*
- Online News Classification System Based on Convolutional Neural Network.
- This project was awarded the provincial 3rd prize in the 2018 national computer design competition.

Skills

Programming: Python · C/C++ · Go · Rust · Matlab/Octave · Julia · R · SQL · LaTeX
ML Libraries: Tensorflow · PyTorch · Keras · Scikit-Learn
Developer Tools: Git · Docker · Google Cloud Platform
OS: Windows · MacOS · Arch Linux
Languages: Chinese (native), and English (professional working proficiency)

Research interests

Graph Algorithms · Centrality Measures · Machine learning · Explainable Artificial Intelligence · Probability Theory · Statistics
Data Compression · Coding Theory · Time Series Analysis · Optimization · Stochastic Modeling · Stochastic Processes

Selected Publications

1. **Zhao C.**, Liu J., Parilina E. M. Complete-to-Sparse: A Novel Graph Construction Strategy for Efficient ShapG // *Mathematical Optimization Theory and Operations Research.* – Cham : Springer Nature Switzerland. – 2025. – P. 180–194.

2. **Zhao C.**, Liu J., Parilina E. M. ShapG: new feature importance method based on the Shapley value // *Engineering Applications of Artificial Intelligence.* – 2025. – May. – Vol. 148, 110409. **(Q1, IF: 8.0)**

3. **Zhao C.**, Parilina E. M. Centrality measures and opinion dynamics in two-layer networks with replica nodes // *Computers and Operations Research.* – 2025. – Aug. – 107245. **(Q1, IF: 4.3)**

4. **Zhao C.**, Parilina E. M. Analysis of consensus time and winning rate in two-layer networks with hypocrisy of different structures // *Vestnik of Saint Petersburg University. Applied Mathematics. Computer Science. Control Processes.* – 2024. – Vol. 20, no. 2. – P. 170-192.

5. **Zhao C.**, Parilina E. M. Opinion Dynamics in Two-Layer Networks with Hypocrisy // *Journal of the Operations Research Society of China.* – 2024. – Mar. – Vol. 12, no. 1. – P. 109-132. **(Q2)**

6. **Zhao C.**, Parilina E. M. Network Structure Properties and Opinion Dynamics in Two-Layer Networks with Hypocrisy // *Mathematical Optimization Theory and Operations Research.* – Cham : Springer Nature Switzerland. – 2024. – P. 300-314.

7. **Zhao C.**, Parilina E. M. Consensus time and winning rate based on simulations in two-layer networks with hypocrisy // *2023 7th Scientific School Dynamics of Complex Networks and their Applications (DCNA).* – 2023. – P. 68-71.

Community service

Reviewer for journals and conferences
- Engineering Applications of Artificial Intelligence (EAAI)
- International Conference On Computational Optimization (ICOMP)

Conferences

Mathematical Optimization Theory and Operations Research (MOTOR 2025) — Novosibirsk, Russia
Oral Presentation — *July. 07 - 11, 2025*

Game Theory and Management (GTM 2025) — Saint-Petersburg, Russia
Oral Presentation — *July. 2 - 4, 2025*

International Conference On Computational Optimization (ICOMP 2024) — Innopolis, Russia
Visitor — *Oct. 10 - Oct. 12, 2024*

Mathematical Optimization Theory and Operations Research (MOTOR 2024) — Omsk, Russia
Oral Presentation — *June. 30 - July. 06, 2024*

Game Theory and Management (GTM 2024) — Saint-Petersburg, Russia
Oral Presentation — *June. 26 - 28, 2024*

Dynamics of Complex Networks and their Applications (DCNA 2023) — Kaliningrad, Russia
Poster Presentation — *Sep. 18 - 20, 2023*

Game Theory and Management (GTM 2023) — Saint-Petersburg, Russia
Oral Presentation — *June. 28 - 30, 2023*

Control Processes and Stability 2022 — Saint-Petersburg, Russia
Oral Presentation — *Apr. 4 - 8, 2022*

Control Processes and Stability 2021 — Saint-Petersburg, Russia
Oral Presentation — *Apr. 5 - 9, 2021*

The Computing Conference 2017 — Hangzhou, China
Visitor — *Oct. 11 - 14, 2017*

Yiban Developer Conference 2017 — Shanghai, China
Developer — *Aug. 2017*

Language & Intelligence Summit 2017 — Beijing, China
Visitor — *July 23, 2017*

Teaching

Applied Statistics in R — Saint-Petersburg, Russia
Teaching assistant — *2024*

Statistical Decisions and Econometrics — Saint-Petersburg, Russia
Teaching assistant — *2022*

Honours & Awards

Name	*Placing*	*Scope*	*Awarder*	*Year*
General Development Star	-	Huawei Inc.	General development department	Oct. 2024
General Development Star	-	Huawei Inc.	General development department	Jun. 2023
General Development Star	-	Huawei Inc.	General development department	Oct. 2022
President's Award (Team)	-	Huawei Inc.	MAE-M department	Dec. 2021
Diploma with distinction	-	University	Saint Petersburg State University	Jun. 2021
Excellent Graduation Thesis (Design)	-	University	Yanan University	Jun. 2019
Excellent Graduate	-	University	Yanan University	Jun. 2019
Merit Student Scholarship	-	University	Yanan University	Dec. 2018
China Software Cup Competition	3rd	China	China Software Cup Organizing Committee	Oct. 2018
Computer Design Competition	3rd	Northwest China	Northwest University (China)	May. 2018
Mathematical Contest in Modeling	2nd	Shaanxi	China Society for Industrial and Applied Mathematics	Dec. 2017
Mathematics Competition	3rd	Shaanxi	Chinese Mathematical Society	Nov. 2016