

# Chi Zhao (Vector)

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## EDUCATION

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| <b>Saint Petersburg State University</b><br><i>PhD in Applied Mathematics and Control Processes</i><br><i>Thesis Title: "Modeling of binary opinion dynamics in social networks of complex configurations"</i> | Sept. 2021 – Jun. 2025<br><i>Saint Petersburg, Russia</i><br><i>Defended in Apr. 2025</i> |
| <b>Saint Petersburg State University</b><br><i>M.S. in Applied Mathematics and Informatics (GPA: 4.9/5.0)</i>  | Sept. 2019 – Jun. 2021<br><i>Saint Petersburg, Russia</i>                                 |
| <b>Beijing Institute of Technology</b><br><i>ACM Summer Camp</i>   | Jul. 3 – 28, 2017<br><i>Beijing, China</i>  |
| <b>Yanan University</b><br><i>B.S. in Computer Science (GPA: 3.1/4.0)</i>  | 2015 – 2019<br><i>Yanan, China</i>  |

## WORKING EXPERIENCE

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| <b>Huawei Inc.</b><br><i>Researcher</i>        | Sep. 2021 – Present<br><i>Saint Petersburg, Russia</i> |
| <b>Wisedu Inc.</b><br><i>Software Engineer</i> | Sep. 2016 – May. 2019<br><i>Yanan, China</i>           |

## PROJECT EXPERIENCE

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| <b>Russian Science Foundation Grant <a href="#">No. 22-21-00346</a></b><br><i>Researcher</i>   | 2023<br><i>Saint Petersburg, Russia</i>      |
| <b>*Valuable training data selection</b><br><i>Researcher</i>  | 2025<br><i>Saint Petersburg, Russia</i>      |
| <b>*Internal columnar storage algorithm</b><br><i>Researcher</i>   | 2023–2024<br><i>Saint Petersburg, Russia</i> |
| <b>*Elastic expansion algorithm for internal distributed file storage systems</b><br><i>Researcher</i>   | 2023<br><i>Saint Petersburg, Russia</i>      |
| <b>*Packet/Router data compression</b><br><i>Researcher</i>  | 2023<br><i>Saint Petersburg, Russia</i>      |
| <b>*Wireless data compression</b><br><i>Researcher</i>   | 2021–2022<br><i>Saint Petersburg, Russia</i> |
| <b>*SparkSQL query optimization</b><br><i>Researcher</i>   | 2021<br><i>Saint Petersburg, Russia</i>      |
| <b>Fast calculation of massive high dimensional vector similarity</b><br><i>Algorithm Engineer</i><br>This project improves the efficiency of the nearest neighbor algorithm and won the 3 <sup>rd</sup> prize in the China Software Cup 2018. | May 2018 – Aug. 2018<br><i>Yanan, China</i>  |
| <b>Online news classification system based on CNN</b><br><i>Full Stack Engineer</i><br>This project has obtained a Chinese software registration certificate and won the 3 <sup>rd</sup> prize in the Computer Design Competition 2018.        | Mar. 2018 – May. 2018<br><i>Yanan, China</i> |

## PATENT / COPYRIGHT CERTIFICATES

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| <b>A program for modeling the opinion dynamics in two-layer networks</b><br><i>Russian Computer Software Copyright Registration Certificate</i>       | 2023<br><a href="#">NO. 2023661532</a> |
| <b>Online News Classification System Based on Convolutional Neural Network</b><br><i>Chinese Computer Software Copyright Registration Certificate</i> | 2018<br><i>NO. 2831192</i>             |

## 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.

- Online News Classification System Based on Convolutional Neural Network.
- This project was awarded the provincial 3<sup>rd</sup> prize in the 2018 national computer design competition.

## SKILLS

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**Programming:** Python · C/C++ · Go · 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

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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

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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. – (accepted, in print). (**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

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**Reviewer for journals and conferences**

- Engineering Applications of Artificial Intelligence (EAAI)
- International Conference On Computational Optimization (ICOMP)

## CONFERENCES

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| <b>Mathematical Optimization Theory and Operations Research (MOTOR 2025)</b><br><i>Oral Presentation</i> | Novosibirsk, Russia<br><i>July. 07 - 11, 2025</i>      |
| <b>Game Theory and Management (GTM 2025)</b><br><i>Oral Presentation</i>                                 | Saint-Petersburg, Russia<br><i>July. 2 - 4, 2025</i>   |
| <b>International Conference On Computational Optimization (ICOMP 2024)</b><br><i>Visitor</i>             | Innopolis, Russia<br><i>Oct. 10 - Oct. 12, 2024</i>    |
| <b>Mathematical Optimization Theory and Operations Research (MOTOR 2024)</b><br><i>Oral Presentation</i> | Omsk, Russia<br><i>June. 30 - July. 06, 2024</i>       |
| <b>Game Theory and Management (GTM 2024)</b><br><i>Oral Presentation</i>                                 | Saint-Petersburg, Russia<br><i>June. 26 - 28, 2024</i> |
| <b>Dynamics of Complex Networks and their Applications (DCNA 2023)</b><br><i>Poster Presentation</i>     | Kaliningrad, Russia<br><i>Sep. 18 - 20, 2023</i>       |
| <b>Game Theory and Management (GTM 2023)</b><br><i>Oral Presentation</i>                                 | Saint-Petersburg, Russia<br><i>June. 28 - 30, 2023</i> |

**Control Processes and Stability 2022***Oral Presentation*

Saint-Petersburg, Russia

*Apr. 4 - 8, 2022***Control Processes and Stability 2021***Oral Presentation*

Saint-Petersburg, Russia

*Apr. 5 - 9, 2021***The Computing Conference 2017***Visitor*

Hangzhou, China

*Oct. 11 - 14, 2017***Yiban Developer Conference 2017***Developer*

Shanghai, China

*Aug. 2017***Language & Intelligence Summit 2017***Visitor*

Beijing, China

*July 23, 2017***TEACHING****Applied Statistics in R***Teaching assistant*

Saint-Petersburg, Russia

*2024***Statistical Decisions and Econometrics***Teaching assistant*

Saint-Petersburg, Russia

*2022***HONOURS & AWARDS**

| <i>Name</i>                          | <i>Placing</i>  | <i>Scope</i>    | <i>Awarder</i>                                       | <i>Year</i> |
|--------------------------------------|-----------------|-----------------|--|-------------|
| 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       | 3 <sup>rd</sup> | China           | China Software Cup Organizing Committee              | Oct. 2018   |
| Computer Design Competition          | 3 <sup>rd</sup> | Northwest China | Northwest University (China)                         | May. 2018   |
| Mathematical Contest in Modeling     | 2 <sup>nd</sup> | Shaanxi         | China Society for Industrial and Applied Mathematics | Dec. 2017   |
| Mathematics Competition              | 3 <sup>rd</sup> | Shaanxi         | Chinese Mathematical Society                         | Nov. 2016   |