Zhenjiang **Zhao**

PH.D. STUDENT

The University of Electro-Communications, Tokyo, Japan

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Research Interest

I am deeply interested in Boolean satisfiability problem (SAT) and algorithmic fairness. In previous years, I focused on the speed-up of SAT solvers. More recently, I am working on applications of SAT in the realm of algorithmic fairness. Specifically, I've been developing an efficient and diversity-aware approach for the fairness testing of machine learning, leveraging sampling techniques from the SAT domain.

Education

Ph.D.	The University of Electro-Communications, Tokyo, Japan.	*2023 - pres.*
M.Eng.	The University of Electro-Communications, Tokyo, Japan.	*2021 - 2023*
B.Math.	The School of Mathematical and Computational Science, Xiangtan University, Xiangtan, China.	*2014 - 2018*

Publications

PEER REVIEWED

Zhenjiang Zhao, Takahisa Toda, and Takashi Kitamura. Diversity-aware fairness testing of machine learning classifiers through hashing-based sampling. Information and Software Technology. 2023. (✎ Paper Link, Code Link)

Zhenjiang Zhao, Takahisa Toda, and Takashi Kitamura. Efficient Fairness Testing Through Hash-Based Sampling. In Proceedings of Search-Based Software Engineering 2022. (✎ Paper Link)

Takashi Kitamura, **Zhenjiang Zhao**, and Takahisa Toda. Applying Combinatorial Testing to Verification-Based Fairness Testing. In Proceedings of Search-Based Software Engineering 2022. (✎ Paper Link)

NON-PEER REVIEWED

Zhenjiang Zhao, and Takahisa Toda. Note on CDCL Inference with Similar Learnt Clauses (in Japanese). In Proceedings of the Annual Conference of JSAI 2022. (✎ Paper Link)

Research Experience

Reviewer	Review activity for journal, Expert systems with applications.	*Jan. 2024*
Research Assistant	Research and development on verification testing of machine learning systems and cyber-physical systems, the National Institute of Advanced Industrial Science and Technology.	*2022 - pres.*
Research Intern	Research on modeling the function of air traffic control, the Electronic Navigation Research Institute.	*Sept. 2021*

Awards, Fellowships, & Grants

2023 - 2026	**The Next Generation Researcher Challenge Research Program of the University of Electro-Communications**, the Japan Science and Technology Agency.	*183,750 yen / month*
2022	**Scholarship for international student**, the Japan Educational Exchanges and Services.	*100,000 yen*
2021	**MEXT Honors Scholarship**, the Japan Student Services Organization.	*48,000 yen*

Poster Presentations

Zhenjiang Zhao*, Takahisa Toda, and Takashi Kitamura. Consideration of Fairness Testing Method Based on a Complete Search for Paths in Decision Tree. In Special Interest Group on Machine Learning Systems Engineering, Jun 2023.

Zhenjiang Zhao*, Takahisa Toda, and Takashi Kitamura. Fairness Testing of Machine Learning Model. In Programming Symposium, Information Processing Society of Japan, Jan 2023.

Zhenjiang Zhao*. Paper Introduction: Efficient Fairness Testing Through Hash-Based Sampling (SSBSE2022). In IPSJ/SIGSE Winter Workshop, Jan 2023.

Zhenjiang Zhao*, Takahisa Toda, and Takashi Kitamura. Fairness Testing Method 'VBT-X' and Its Future Challenges. In Workshop of Information-Based Induction Sciences, Nov 2022.

Zhenjiang Zhao*, Takahisa Toda, and Takashi Kitamura. VBT-X: A Fairness Testing Method of Machine Learning Model. In Workshop of Fundamentals of Software Engineering, Nov 2022.

Teaching Experience

Fall 2023	**Complex Analysis**, Teaching Assistant.
Fall 2022	**Computer Literacy**, Teaching Assistant.
Fall 2022	**Complex Analysis**, Teaching Assistant.
Spring 2022	**Fundamental Programming**, Teaching Assistant.

Competition Experience

2022	**SAT Competition**, 3rd on the CaDiCaL Hacks Track.
2021	**Yamato Transport 5 Days data competition**, Victory.
2021	**Yamato Transport Hackathon: the SDGs Challenge**, Victory.
2017	**Contemporary Undergraduate Mathematical Contest in Modeling**, Second Prize.
2016	**Contemporary Undergraduate Mathematical Contest in Modeling**, Second Prize.