Curriculum Vitae – Shuhei Watanabe

October 7, 2025

General Information

Please check my GitHub and homepage for more details of my personal projects. You can also find my research profiles on Google Scholar. If you would like to reach me out, please feel free to contact me via email (shuhei.watanabe.utokyo@gmail.com).

Education

Oct 2020 – Oct 2023	**University of Freiburg** - Freiburg, Germany. Master of Computer Science. Supervisor: Prof. Frank Hutter. Overall GPA: 1.1/5.0 (1.0 is the best grade).
Sep 2015 – Mar 2020	**The University of Tokyo** - Tokyo, Japan. Bachelor in Systems Innovation, Faculty of Engineering. Break for working at M3 and AIST from Apr 2018 to Sep 2019. Overall GPA: 3.78/4.0 (4.0 is the best grade). Graduated with **the Best GPA** out of 37 students.
Apr 2014 – Aug 2015	**The University of Tokyo** - Tokyo, Japan. Bachelor of College of Arts and Science, Natural Science 1.

Employment

Jun 2024 – Present	**National Institute of Advanced Industrial Science and Technology (AIST)** - Tokyo, Japan. Visiting Researcher of Social Intelligence Research Team.
Oct 2023 – Present	**Preferred Networks Inc.** - Tokyo, Japan. Development of Optuna and support of its internal usage.
Dec 2020 – Oct 2023	**Machine Learning Lab** - Freiburg, Germany. Development of Auto-PyTorch, an AutoML tool.
Sep 2018 – Sep 2020	**National Institute of Advanced Industrial Science and Technology (AIST)** - Tokyo, Japan. Technical Staff (Full-Time) of Social Intelligence Research Team for AutoML Research.
Apr 2018 – Aug 2018	**M3, Inc.** - Tokyo, Japan. Market Researcher and Consultant (Full-Time Internship). Genome Business Consulting.

Awards / Honors

Sep 2023 **AutoML 2023 Travel Awards** (500 EURO).

Aug 2023 **IJCAI-AIJ 2023 Travel and Accessibility Grant Program** (1,000 USD).

Oct 2022 **NeurIPS 2022 Complimentary Registration** (350 USD).
Supported by Gaussian Processes workshop organizers.

Oct 2022 **ELIZA MSc Scholarship** (1,000 Euro/month).
4 students were selected from the whole Computer Science Master Program in the University of Freiburg.

Oct 2022 **Deutschlandstipendium** (300 Euro/month).

Jul 2022 **1st Prize in AutoML2022: Multiobjective Hyperparameter Optimization for Transformers**

Sep 2020 **ITO Foundation for International Education Exchange**
(2,000 USD/month for 2 years, AR: 13/193=6.7%).

Mar 2020 **Hatakeyama Award from the Japan Society of Mechanical Engineers**.
This award is for the distinctive grades at the mechanical engineering related faculties at the University of Tokyo (AR: 5/340=1.5%).

May 2019 **PRMU 2018 Yearly Research Encouragement Award**.
The paper "*Speed Up of Hyper-Parameter Tuning with Nelder-Mead Method by Parallel Computing*" was awarded. 3 papers were selected out of 170 papers. (AR: 3/170=1.8%).

Oct 2014 **1st Prize in the Freshman Team Hokei in the National Intercollegiate Taido Tournament**. Taido is one of the Japanese traditional martial arts.

Publications

I list acceptance rate for prizes or conferences where available as "AR: (papers accepted)/(papers submitted)=(percentage)". ◯ refers to the presenter. ♣ refers to the equally contributed authors.

Theses

1. ◯ **S. Watanabe** (2023). Significant Runtime Reduction for Asynchronous Multi-Fidelity Optimization on Zero-Cost Benchmarks. Master thesis at the University of Freiburg.
2. ◯ **S. Watanabe** (2018). A Study on the Spontaneously Emerged Cooperation in a Collective Game with AI Type Agents. Bachelor thesis at the University of Tokyo.

Referred Journal Publications

1. S. Shigenaka, S. Takami, **S. Watanabe**, Y. Tanigaki, M. Onishi (2024). MAS-Bench: A Benchmarking for Parameter Calibration of Multi-Agent Crowd Simulation. Journal

of Computational Social Science.

2. Y. Ozaki, Y. Tanigaki, **S. Watanabe**, M. Nomura, M. Onishi (2022). Multiobjective Tree-Structured Parzen Estimator. Journal of Artificial Intelligence Research (JAIR).

Referred Conference Publications

1. ◯ C. Mori, **S. Watanabe**, M. Onishi, Takayuki Itoh (2025). User Preference-Based Parallel Coordinate Plots: Its Application in Guidance Planning. International Conference on Pedestrian and Evacuation Dynamics (PED).

2. ◯ ♣ C. Mori, ♣ **S. Watanabe**, M. Onishi, Takayuki Itoh (2025). Preference-Optimal Multi-Metric Weighting for Parallel Coordinate Plots. International Conference Information Visualisation (iV).

3. ◯ **S. Watanabe**, N. Mallik, E. Bergman, F. Hutter (2024). Fast Benchmarking of Asynchronous Multi-Fidelity Optimization on Zero-Cost Benchmarks. AutoML Conference.

4. ◯ **S. Watanabe**, F. Hutter (2023). c-TPE: Tree-Structured Parzen Estimator with Inequality Constraints for Expensive Hyperparameter Optimization. International Joint Conference on Artificial Intelligence (IJCAI) (AR: 644/4566≃14%).

5. ◯ **S. Watanabe**, N. Awad, M. Onishi, F. Hutter (2023). Speeding Up Multi-Objective Hyperparameter Optimization by Task Similarity-Based Meta-Learning for the Tree-Structured Parzen Estimator. International Joint Conference on Artificial Intelligence (IJCAI) (AR: 644/4566≃14%).

6. ◯ **S. Watanabe**, A. Bansal, F. Hutter (2023). PED-ANOVA: Efficiently Quantifying Hyperparameter Importance in Arbitrary Subspaces. International Joint Conference on Artificial Intelligence (IJCAI) (AR: 644/4566≃14%).

7. ◯ S. Shigenaka, S. Takami, **S. Watanabe**, Y. Tanigaki, Y. Ozaki, M. Onishi (2021). MAS-Bench: Parameter Optimization Benchmark for Multi-Agent Crowd Simulation. International Conference on Autonomous Agents and Multi-Agent Systems (AAMAS).

8. ◯ ♣ M. Nomura, ♣ **S. Watanabe**, Y. Akimoto, Y. Ozaki, M. Onishi (2021). Warm Starting CMA-ES for Hyperparameter Optimization. AAAI Conference on Artificial Intelligence (AAAI). (AR: 1692/9034=19%).

9. ◯ S. Takenaga, **S. Watanabe**, M. Nomura, Y. Ozaki, M. Onishi, H. Habe (2020). Evaluating Initialization of Nelder–Mead Method for Hyperparameter Optimization in Deep Learning. International Conference on Pattern Recognition (ICPR). Oral Presentation.

10. ◯ Y. Ozaki, Y. Tanigaki, **S. Watanabe**, M. Onishi (2020). Multiobjective Tree-Structured Parzen Estimator for Computationally Expensive Optimization Problems. The Genetic and Evolutionary Computation Conference (GECCO).

11. ◯ **S. Watanabe**, Y. Ozaki, Y. Bando, M. Onishi (2019). Speeding Up of the Nelder–Mead Method by Data–Driven Speculative Execution. Asian Conference on Pattern Recognition (ACPR). Oral Presentation. (AR: 128/273=46%, **Oral presentation: 36/273=13%**)

Referred Workshop Publications

1. ◯ **S. Watanabe** (2023). Python Wrapper for Simulating Multi-Fidelity Optimization on HPO Benchmarks without Any Wait. AutoML Conference Workshop Track.
2. ◯ **S. Watanabe**, N. Awad, M. Onishi, F. Hutter (2022). Multi-Objective Tree-Structured Parzen Estimator Meets Meta-learning. Workshop on Meta-Learning at NeurIPS (MetaLearn).
3. ◯ **S. Watanabe**, F. Hutter (2022). c-TPE: Generalizing Tree-Structured Parzen Estimator with Inequality Constraints for Continuous and Categorical Hyperparameter Optimization. Workshop on Gaussian Processes, Spatiotemporal Modeling, and Decision-Making Systems at NeurIPS (GPSMDM).
4. ◯ ♣ M Nomura, ♣ **S. Watanabe**, Y. Ozaki, M. Onishi (2019). Warm Starting Method for CMA-ES. Workshop on Meta-Learning at NeurIPS (MetaLearn).
5. ◯ Y. Ozaki, ◯ **S. Watanabe**, M. Onishi (2019). Accelerating the Nelder–Mead Method with Predictive Evaluation. Workshop on Automated Machine Learning at ICML (AutoML).

Preprints

1. ♣ Y. Ozaki, ♣ **S. Watanabe**, T. Yanase (2025). OptunaHub: A Platform for Black-Box Optimization. arXiv:2510.02798.
2. K. Abe, Y. Wang, **S. Watanabe** (2025). Tree-Structured Parzen Estimator Can Solve Black-Box Combinatorial Optimization More Efficiently. arXiv:2507.08053.
3. **S. Watanabe** (2025). Derivation of Output Correlation Inferences for Multi-Output (aka Multi-Task) Gaussian Process. arXiv:2501.07964.
4. **S. Watanabe** (2024). Derivation of Closed Form of Expected Improvement for Gaussian Process Trained on Log-Transformed Objective. arXiv:2411.18095.
5. **S. Watanabe** (2023). Python Tool for Visualizing Variability of Pareto Fronts over Multiple Runs. arXiv:2305.08852.
6. **S. Watanabe** (2023). Tree-Structured Parzen Estimator: Understanding Its Algorithm Components and Their Roles for Better Empirical Performance. arXiv:2304.11127.
7. ◯ **S. Watanabe**, M. Nomura, M. Onishi (2020). The Characteristics Required in Hyperparameter Optimization of Deep Learning Algorithms. Japanese Society of Artificial Intelligence (JSAI).
8. ◯ **S. Watanabe**, Y. Ozaki, M. Onishi (2019). Speed Up of Hyper-Parameter Tuning with Nelder–Mead Method by Parallel Computing. Pattern Recognition and Media Understanding (PRMU). **PRMU 2018 Yearly Research Encouragement Award** (AR: 3/170=1.8%).

Talks

1. ○ **S. Watanabe**, H. Imamura, C. Shinagawa, K. Shinohara, S. Takamoto, J. Li (2024). Multi-Objective Bayesian Optimization for Materials Discovery with Neural Network Potential – An Application to Li-Ion Battery Cathode Material. Materials Research Society Fall Meeting & Exhibit.

Mentoring & Supervision

Jun 2024 – Present	**Chisa Mori** BSc Student, AIST. Theme: Parallel coordinate plots for multi-objective problems.
July 2024 – Present	**Kaito Baba** MSc Student, Preferred Networks. Theme: Development of constrained optimization for the Gaussian process-based sampler (Single-objective, Multi-objective).
Aug 2025 – Present	**Kaichi Irie** - MSc Student, Preferred Networks & AIST. Theme: Development of parallel processing in the Gaussian process-based sampler (Article).

Certificates

TOEFL iBT	Total 100 (R: 29, L: 25, S: 22, W: 24) on Jun 2019.
GRE	Q: 168 (Top 7%), V: 152 (Top 46%), W: 4.0 (Top 43%) on Nov 2019.
AtCoder	Highest Rating 1626 (Approx. Top 3.5%)

Language Skills

Japanese	Native Language.
English	CEFR C1.
German	CEFR B2.
French	CEFR A1.