

Curriculum Vitae – Shuheï Watanabe

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General Information

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GitHub <https://github.com/nabenabe0928>

Homepage <https://nabenabe0928.github.io>

Education

Oct 2020 – Oct 2023 **Albert–Ludwigs–Universität 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.
Leave the university 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 (Side Job).

Oct 2023 – Present **Preferred Networks Inc.** - Tokyo, Japan.
Research Engineer as an Optuna Developer.
GitHub URL: <https://github.com/optuna/optuna>

Dec 2020 – Oct 2023 **The Machine Learning Lab in Albert–Ludwigs–Universität Freiburg** - Freiburg, Germany.
Research Assistant as an Auto-PyTorch Developer.
GitHub URL: <https://github.com/automl/Auto-PyTorch>

- Sep 2018 – Sep 2020 **National Institute of Advanced Industrial Science and Technology (AIST)** - Tokyo, Japan.
Technical Staff (Full-Time) 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).
- Oct 2022 **ELIZA MSc Scholarship** (1,000 Euro/month).
- 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%).
URL: <https://www.jsme.or.jp/archive/award/shou4-19.pdf>
- May 2019 **PRMU 2018 Yearly Research Encouragement Award** for the paper *Speed Up of Hyper-Parameter Tuning with Nelder-Mead Method by Parallel Computing*, jointly with Yoshihiko Ozaki, Masaki Onishi.
3 papers were selected out of 170 papers. (AR: 3/170=1.8%).
URL: https://www.ieice.org/~prmu/jpn/award_list.html
- 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. ○ **S. Watanabe**, N. Mallik, E. Bergman, F. Hutter (2024). Fast Benchmarking of Asynchronous Multi-Fidelity Optimization on Zero-Cost Benchmarks. AutoML Conference.
2. ○ **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%).
3. ○ **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%).
4. ○ **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%).
5. ○ 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).
6. ○ ♣ 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%).

7. ○ 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.
8. ○ 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).
9. ○ **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. ○ **S. Watanabe** (2025). Derivation of Output Correlation Inferences for Multi-Output (aka Multi-Task) Gaussian Process. arXiv:2501.07964.
2. ○ **S. Watanabe** (2024). Derivation of Closed Form of Expected Improvement for Gaussian Process Trained on Log-Transformed Objective. arXiv:2411.18095.
3. ○ **S. Watanabe** (2023). Python Tool for Visualizing Variability of Pareto Fronts over Multiple Runs. arXiv:2305.08852.
4. ○ **S. Watanabe** (2023). Tree-Structured Parzen Estimator: Understanding Its Algorithm Components and Their Roles for Better Empirical Performance. arXiv:2304.11127.
5. ○ **S. Watanabe**, M. Nomura, M. Onishi (2020). The Characteristics Required in Hyperparameter Optimization of Deep Learning Algorithms. Japanese Society of Artificial Intelligence (JSAI).

6. ○ **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.

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.

AtCoder¹ Highest Rating 1626 (Approx. Top 3.5%)

Language Skills

Japanese Native Language.

English CEFR C1.

German CEFR B2.

French CEFR A1.

¹ <https://atcoder.jp/users/nabenabe0928>