

YOSUKE MIZUTANI

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RESEARCH INTERESTS

Parameterized algorithms and graph theory.

EDUCATION

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| University of Utah , Salt Lake City, UT, USA | August 2020 – December 2024 |
| Ph.D. in Computer Science / Advisor: Blair D. Sullivan | |
| NC State University , Raleigh, NC, USA | August 2017 – May 2020 |
| B.S. in Computer Science with a minor in Mathematics / Summa Cum Laude | |

RESEARCH EXPERIENCE

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| University of Utah , Salt Lake City, UT, USA – <i>Research Assistant</i> | August 2020 – present |
| <ul style="list-style-type: none"> • PACE 2023 Twin-Width: 1st place in the Exact Track and Theory Award. • Parameterized approaches to the inspection planning problem in robotics. • Preprocessing “beyond kernelization” for the odd cycle transversal problem. | |
| NC State University , Raleigh, NC, USA – <i>Undergraduate Student Researcher</i> | January 2018 – May 2020 |
| <ul style="list-style-type: none"> • Advisors: Matthias Stallmann and Aissa Oudjit • The minimum independent dominating set problem; developing an exact solver. • Facility location problems, including the p-median problem; integer programming. | |
| The Institute of Statistical Mathematics , Tokyo, JAPAN – <i>Researcher</i> | August 2015 – December 2015 |
| <ul style="list-style-type: none"> • Bibliometrics; data analysis of co-authoring relationship between ten years’ published research papers. | |

WORK EXPERIENCE

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| Demand Side Science Co., LTD. , Tokyo, JAPAN – <i>CTO / Senior VP / Full-stack Engineer</i> | April 2013 – November 2015 |
| Nihon System Design Co., LTD. , Tokyo, JAPAN – <i>Chief Server Engineer</i> | December 2003 – March 2013 |

MANUSCRIPTS

- M. Bentert, D. Coimbra Salomao, A. Crane, Y. Mizutani, F. Reidl, B. D. Sullivan. Graph Inspection for Robotic Motion Planning: Do Arithmetic Circuits Help?. arXiv:2409.08219 [cs.RO].
- T.E. Reiter, L. Irber, A.A. Gingrich, D. Haynes, N. T. Pierce-Ward, P.T. Brooks, Y. Mizutani, D. Moritz, F. Reidl, A.D. Willis, B.D. Sullivan, C.T. Brown. Meta-analysis of metagenomes via machine learning and assembly graphs reveals strain switches in Crohn’s disease. bioRxiv:10.1101/2022.06.30.498290.

PEER-REVIEWED PUBLICATIONS

- Y. Mizutani, D. Coimbra Salomao, A. Crane, M. Bentert, P.G. Drange, F. Reidl, A. Kuntz, B. D. Sullivan. Leveraging Fixed-Parameter Tractability for Robot Inspection Planning. *Proceedings of the 16th International Workshop on the Algorithmic Foundations of Robotics*, 2024.
- B.M.P. Jansen, Y. Mizutani, B.D. Sullivan and R.F.A. Verhaegh. Preprocessing to Reduce the Search Space for Odd Cycle Transversal. *Proceedings of the 19th International Symposium on Parameterized and Exact Computation*, 2024.
- S. Jain, Y. Mizutani, B. D. Sullivan. An Exponentially Smaller Kernel for Exact Weighted Clique Decomposition. *Proceedings of the SIAM Conference on Applied and Computational Discrete Algorithms*, 2023.
- Y. Mizutani, B. D. Sullivan. Parameterized Complexity of Maximum Happy Set and Densest k-Subgraph. *Proceedings of the 17th International Symposium on Parameterized and Exact Computation*, 2022.
- Y. Mizutani, A. Staker, B. D. Sullivan. Minimizing Congestion for Balanced Dominators. *Proceedings of the 28th ACM SIGKDD Conference on Knowledge Discovery and Data Mining*, 2022.
- Y. Mizukami, Y. Mizutani, K. Honda, S. Suzuki, J. Nakano. An international research comparative study of the degree of cooperation between disciplines within mathematics and mathematical sciences: proposal and application of new indices for identifying the specialized field of researchers. *Behaviormetrika*, 2017.

MAJOR PRESENTATIONS

International Workshop on the Algorithmic Foundations of Robotics (WAFR) , Chicago, IL, USA	October 2024
Leveraging Fixed-Parameter Tractability for Robot Inspection Planning	
International Symposium on Parameterized and Exact Computation (IPEC) , Amsterdam, Netherlands	September 2023
Hydra Prime: A Twin-Width Solver for PACE 2023	
Dagstuhl Seminar 23331: Recent Trends in Graph Decomposition , Wadern, Germany	August 2023
Approximate Modular Decomposition for Practical Graph Preprocessing	
SIAM Conference on Applied and Computational Discrete Algorithms (ACDA) , Seattle, WA, USA	June 2023
Clique Wrangler: Wrangling Gene Expression Data into Weighted Cliques (poster)	
Joint Math Meetings (JMM 2023) , Boston, MA, USA	January 2023
Information Loss in Weighted Hypergraph Line Graphs and Clique Expansions	
SIAM Workshop on Network Science (SIAM-NS) , Online	September 2022
Minimizing Congestion for Balanced Dominators	
International Symposium on Parameterized and Exact Computation (IPEC) , Potsdam, Germany	September 2022
Some Happy FPT Results: Improved Parameterized Complexity of Happy Set Problems	
ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD) , Washington DC, USA	August 2022
Minimizing Congestion for Balanced Dominators	

MAJOR ACTIVITIES

International Collegiate Programming Contest (ICPC)

Regional Judge	2023-2024
Rocky Mountain Regional, Provo, UT, USA (representing the University of Utah)	October 2021
North America Championship, Atlanta, GA, USA (representing NC State University)	February 2020

University of Utah Kahlert School of Computing

Technical Coding Club Coach	2022-2024
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Czech Summer School on Discrete Mathematics

CSSDM24 (Twin-width, Poset Inequality), Prague, Czechia (awarded travel support)	July 2024
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Parameterized Algorithms and Computational Experiments Challenge (PACE)

PACE 2023: Twinwidth (1 st place in Exact Track/Theory Award)	June 2023
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American Mathematical Society (AMS) Mathematics Research Communities

Models and Methods for Sparse (Hyper) Network Science, Buffalo, NY, USA	June 2022
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TEACHING EXPERIENCE

Teaching Assistant

Graduate Algorithms (CS 5150/6150), University of Utah	Fall 2021, Fall 2022
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