YOSUKE MIZUTANI

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RESEARCH INTERESTS

Parameterized algorithms and graph theory.

EDUCATION

University of Utah, Salt Lake City, UT, USA   August 2020 – expected 2025
    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

University of Utah, Salt Lake City, UT, USA – *Research Assistant*   August 2020 – present
- PACE 2023 Twin-Width: 1st place on the Exact Track and Theory Award
- Parameterized complexity of happy set problems; designing algorithms for several graph parameters
- Sparse dominating sets for metagenomics application; accepted at KDD 2022.
- Edge-weighted clique decomposition problems; working with biology datasets

NC State University, Raleigh, NC, USA – *Undergraduate Student Researcher*   January 2018 – May 2020
- 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 – *Researcher*   August 2015 – December 2015
- Bibliometrics; data analysis of co-authoring relationship between ten years' published research papers

WORK EXPERIENCE

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

MANUSCRIPTS

- 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

- 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 (ACDA23)*, 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 Symposium on Parameterized and Exact Computation (IPEC), Amsterdam, Netherlands   Sepetember 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

International IBM Cloud Academy Conference (ICA CON), Tokyo, JAPAN   May 2018
>An Analysis of Abstract Texts of Academic Papers Using Watson Natural Language Understanding

ISM High Performance Computing Conference (HPCCon), Tokyo, JAPAN   October 2015
>A Network Analysis for Relationship of Researchers based upon the Co-authored Information and Other Attributes on "Web of Science" using Apache Spark and GraphX

Scala Days 2015, San Francisco, CA, USA   March 2015
>Ad tech, Scala, and Performance Tuning

MAJOR ACTIVITIES

University of Utah Kahlert School of Computing
>Technical Coding Club Coach   2022-present
>Graduate Student Advisory Committee (GradSAC)   2021-2022

American Mathematical Society (AMS) Mathematics Research Communities
>Models and Methods for Sparse (Hyper) Network Science, Buffalo, NY, USA   June 2022

Parameterized Algorithms and Computational Experiments Challenge (PACE)
>PACE 2023: Twinwidth (1st place)   June 2023
>PACE 2022: Directed Feedback Vertex Set (8th place)   June 2022
>PACE 2021: Cluster Editing (6th place)   June 2021

International Collegiate Programming Contest (ICPC)
>Regional Judge   2023-present
>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
>Mid-Atlantic USA Regional, Durham, NC, USA (representing NC State University)   November 2019

TEACHING EXPERIENCE

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