

Tasuku Soma

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February 6, 2020

EDUCATION

The University of Tokyo

Ph.D (Information Science and Technology): supervised by Prof. Satoru Iwata

Tokyo, Japan

March 2016

Kyoto University

Master of Science: supervised by Prof. Satoru Iwata

Kyoto, Japan

March 2013

Kyoto University

Bachelor of Science

Kyoto, Japan

March 2011

EMPLOYMENT

Assistant Professor

The University of Tokyo

April 2016 - current

JSPS Research Fellowships for Young Scientists

The University of Tokyo

April 2014 - March 2016

Research Assistant

JST ERATO Kawarabayashi Large Graph Project

April 2013 - March 2014

GRANT

JSPS Grant-in-Aid for Early-Career Scientists

4,000,000 JPY

April 2019 - March 2022

Japan Science and Technology Agency ACT-I

3,000,000 JPY

September 2017 - March 2019

JSPS Grant-in-Aid for Research Activity Start-up

2,900,000 JPY

September 2016 – March 2018

JSPS Research Fellowships for Young Scientists

1,900,000 JPY

April 2014 - March 2016

AWARDS

Dean's list for Ph.D thesis

Graduate school of information science and technology, the university of Tokyo

March 2016

Student Paper Award

Japan operations research society

March 2013

TEACHING

Courses Taught

- Exercise course of geometry 2017 Fall, 2018 Fall, 2019 Fall, the university of Tokyo
- Exercise course of algebra 2016 Summer, the university of Tokyo

Graduate Students Supervised.....

- Joachim Moussalli (M.Sc, EPFL¹), 2019.

RESEARCH INTERESTS

- Submodular optimization and its applications in machine learning
- Sparsification and spectral methods in algorithm design
- Compressed sensing, tensor approximation, and matrix spaces

RESEARCH VISIT

- **University of British Columbia** (hosted by Nicholas J. A. Harvey), August to September, 2019.
- **Max Planck Institute of Mathematics in Sciences** (hosted by André Uschmajew), September, 2018.

SERVICE TO THE COMMUNITY

Journal and Conference Referees.....

- Mathematics of Operations Research
- Algorithmica
- Discrete Optimization
- Applied Mathematics and Optimization
- ISSAC 2018
- FOCS 2018
- ESA 2017
- SODA 2017, 2020
- AAAI 2017
- IPCO 2017, 2016
- NIPS 2016
- NeurIPS 2019

PUBLICATIONS

Refereed Journal Articles.....

- [1] T. Soma. “Fast deterministic algorithms for matrix completion problems”. In: *SIAM Journal on Discrete Mathematics* 28.1 (2014), pp. 490–502.
- [2] T. Soma. “Multicasting in linear deterministic relay network by matrix completion”. In: *IEEE Transactions on Information Theory* 62.2 (2016), pp. 870–875.
- [3] Y. Nakatsukasa, T. Soma, and A. Uschmajew. “Finding a low-rank basis in a matrix subspace”. In: *Mathematical Programming* 162.1-2 (2017), pp. 325–361.
- [4] Z. Li, Y. Nakatsukasa, T. Soma, and A. Uschmajew. “On Orthogonal Tensors and Best Rank-One Approximation Ratio”. In: *SIAM Journal on Matrix Analysis and Applications* 39.1 (2018), pp. 400–425.
- [5] T. Soma and Y. Yoshida. “Maximizing monotone submodular functions over the integer lattice”. In: *Mathematical Programming* (2018).

¹He visited the university of Tokyo as an exchange student

Refereed Conference Proceedings.....

- [6] T. Soma. “Fast Deterministic Algorithms for Matrix Completion Problems”. In: *Integer Programming and Combinatorial Optimization (IPCO)*. 2013, pp. 375–386.
- [7] T. Soma. “Multicasting in linear deterministic relay network by matrix completion”. In: *Proceedings of the IEEE International Symposium on Information Theory (ISIT)*. 2014, pp. 1191–1195.
- [8] T. Soma, N. Kakimura, K. Inaba, and K. Kawarabayashi. “Optimal budget allocation: Theoretical guarantee and efficient algorithm”. In: *Proceedings of the 31st International Conference on Machine Learning (ICML)*. cycle 1. 2014, pp. 556–568.
- [9] T. Soma and Y. Yoshida. “A generalization of submodular cover via the diminishing return property on the integer lattice”. In: *Advances in Neural Information Processing Systems (NIPS)*. 2015, pp. 847–855.
- [10] T. Soma and Y. Yoshida. “Non-convex compressed sensing with the sum-of-squares method”. In: *Proceedings of 17th the Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)*. 2016, pp. 570–579.
- [11] T. Soma and Y. Yoshida. “Maximizing Monotone Submodular Functions over the Integer Lattice”. In: *Integer Programming and Combinatorial Optimization (IPCO)*. 2016, pp. 325–336.
- [12] T. Soma and Y. Yoshida. “Non-monotone DR-submodular function maximization”. In: *Proceedings of the 31st AAAI Conference on Artificial Intelligence*. 2017, pp. 898–904.
- [13] T. Soma and Y. Yoshida. “Regret ratio minimization in multi-objective submodular function maximization”. In: *Proceedings of the 31st AAAI Conference on Artificial Intelligence*. 2017, pp. 905–911.
- [14] K. Fujii and T. Soma. “Fast greedy algorithms for dictionary selection with generalized sparsity constraints”. In: *Advances in Neural Information Processing Systems (NeurIPS) 31*. **spotlight**. 2018, pp. 4749–4758.
- [15] T. Soma and Y. Yoshida. “A New Approximation Guarantee for Monotone Submodular Function Maximization via Discrete Convexity”. In: *Proceedings of the 45th International Colloquium on Automata, Languages, and Programming, (ICALP)*. 2018, 99:1–99:14.
- [16] T. Soma. “No-regret algorithms for online k -submodular maximization”. In: *Proceedings of Machine Learning Research (AISTATS)*. Vol. 89. 2019, pp. 1205–1214.
- [17] T. Soma and Y. Yoshida. “Spectral Sparsification of Hypergraphs”. In: *Proceedings of the 20th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)*. 2019, pp. 2570–2581.