

Theophile THIERY

Final Year Ph.D. Student

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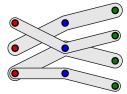
Research interests

My research focuses both on solving fundamental combinatorial optimization problems and on their connection to concrete tasks in machine learning by designing efficient algorithms with provable performance guarantees. In particular, I have designed the current state-of-the-art approximation algorithm for 3-dimensional matching, and for multiple sparse subset selection problems using combinatorial insights.

Education

- Nov.2019– **Ph.D. in Theoretical Computer Sciences**, Queen Mary University of London, London.
present Supervisor: Dr. Justin Ward
- 2017–2019: **Master of Science in Applied Mathematics**, Ecole Polytechnique Fédérale de Lausanne.
- 2013–2017 : **Bachelor of Science in Mathematics**, Ecole Polytechnique Fédérale de Lausanne.

Projects

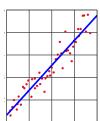


Weighted k -Set Packing Problem

SODA 2023

with Justin Ward. Improve upon the best approximation algorithm for weighted k -Set Packing and consequently for weighted 3-dimensional matching via a local-search algorithm [2].

Talks: ■ Combinatorial Optimization and Logistic Seminar, Bremen, October 2022
■ PostGraduate Day, London, May 2022 ■ Combinatorics group, London, Mars 2022

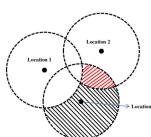


Connecting Regression and Submodularity,

COLT 2022

with Justin Ward. Devise efficient algorithms for least-square regression, bayesian A-optimal design, and column subset selection via a new connection to submodular functions [3].

Talks: ■ COLT conference, London, June 2022 ■ Combinatorics group, QMUL, July 2021
■ Combinatorics Ph.D. seminar, QMUL, March 2021



Multipass Algorithms for Submodular Functions Maximization, APPROX 2020

with Chien-Chung Huang and Justin Ward. Develop state-of-the-art streaming approximation algorithms to maximize submodular function under matroid and p -matchoid constraints [1].

Talks: ■ DISOPT seminar, Lausanne, June 2020
■ APPROX/RANDOM conference, virtual, August 2020

Experiences and Visits



Universität Bremen Academic Visit

October 2022–November 2022

Host: Prof. Dr. Nicole Megow. Integration of machine learned advice to online matching problems to bridge theory and practice and go beyond worst-case analysis.



TRANSP-OR: Research Assistant

March 2019 - June 2019

Development of a new framework, which incorporates customers' utility, to model and analyze possible Nash equilibria on the Italian railway network. <https://transp-or.epfl.ch/>



Zuse Institute Berlin (ZIB): Research Intern

March 2018 – August 2018

Zuse Institute Berlin is a research institute for applied mathematics. Developed and successfully programmed an optimality certificate for mixed-integer problem solutions. We proposed and extended existing methods. Emphasis on mathematical programming optimization.
<http://www.zib.de>

Teaching Assistant

2017–2022 **QMUL:** Calculus I (2 semesters), Linear Programming and Games (2 semesters), **EPFL:** Analysis I (5 semesters), Advanced Linear Algebra, Discrete Optimization.

Professional Service

2021–present **Reviewing:** Operations Research Letters, Journal of Combinatorial Optimization.

Language and Skills

Languages: ■ French (native) ■ English (C1) ■ German (B2)

Programming: ■ C++/C (advanced) ■ Python (intermediate) ■ Matlab (intermediate)

Extracurricular Activities

Sports in competition: *Artistic Gymnastic* (10 years). *Ultimate Frisbee* (3 years) Mixed National Swiss Champion 2018. **Other:** Member of IPCC report study group to understand the impact and mitigation of climate change.

References

- [1] Chien-Chung Huang, Theophile Thiery, and Justin Ward. “Improved Multi-Pass Streaming Algorithms for Submodular Maximization with Matroid Constraints”. In: *APPROX/RANDOM 2020, August 17-19, 2020, Virtual Conference*. 2020. URL: <https://doi.org/10.4230/LIPIcs.APPROX.RANDOM.2020.62>.
- [2] Theophile Thiery and Justin Ward. “An Improved Approximation for Maximum Weighted k -Set Packing”. In: *To Appear in SODA’23*. 2023.
- [3] Theophile Thiery and Justin Ward. “Two-Sided Weak Submodularity for Matroid Constrained Optimization and Regression”. In: *COLT, 2-5 July 2022, London, UK*. 2022. URL: <https://proceedings.mlr.press/v178/thiery22a.html>.