# Luca Zanetti

Work address: Department of Computer Science and Technology
University of Cambridge
CB3 0FD, United Kingdom

Email: luca.zanetti@cl.cam.ac.uk
Web: www.cl.cam.ac.uk/~lz381

## Research Interests

Algorithms for massive data sets

Unsupervised and semi-supervised learning on graphs

Spectral graph theory (with applications to algorithm design and machine learning)

Randomised and distributed algorithms

Markov chains

## Current position

**June 2017 - present**

**Research Assistant** at the Department of Computer Science and Technology, University of Cambridge

Supervised by Dr. Thomas Sauerwald

**October 2018 - present**

**Affiliated Lecturer** at the Department of Computer Science and Technology, University of Cambridge

## Education

**University of Bristol, 2018**

PhD in Computer Science. Thesis title: Algorithms for partitioning well-clustered graphs.

Supervised by Dr. He Sun

**University of Milan, 2013**

Master degree in Computer Science. Final grade: 110/110 *cum laude*.

**University of Milan, 2011**

Bachelor degree in Computer Science. Final grade: 110/110 *cum laude*.

## Publications (authors listed in alphabetical order)

Hermitian matrices for clustering directed graphs: insights and applications. Mihai Cucuringu, Huan Li, He Sun, and Luca Zanetti. To appear in *Proceedings of The 23rd International Conference on Artificial Intelligence and Statistics, AISTATS 2020*.

Distributed Graph Clustering and Sparsification. He Sun and Luca Zanetti. In *ACM Transactions on Parallel Computing, Volume 6 Issue 3, Article 17 (November 2019)*. A previous version appeared in *Proceedings of the 29th ACM Symposium on Parallelism in Algorithms and Architectures, SPAA 2017*.

Hermitian Laplacians and a Cheeger Inequality for the Max-2-Lin Problem. Huan Li, He Sun, and Luca Zanetti. In *Proceedings of the 27th Annual European Symposium on Algorithms, ESA 2019*.

Random Walks on Dynamic Graphs: Mixing Times, Hitting Times, and Return Probabilities. Thomas Sauerwald and Luca Zanetti. In *Proceedings of the 46th International Colloquium on Automata, Languages, and Programming, ICALP 2019*.

Partitioning Well-Clustered Graphs: Spectral Clustering Works! Richard Peng, He Sun, and Luca Zanetti. In *SIAM Journal of Computing 46.2 (2017)*. Previously appeared in *Proceedings of The 28th Conference on Learning Theory, COLT 2015*.

A quantum-walk-inspired adiabatic algorithm for solving graph isomorphism problems. Dario Tamascelli and Luca Zanetti. In *Journal of Physics A: Mathematical and Theoretical 47.32 (2014)*.

Random walks in randomly evolving graphs. Leran Cai, Thomas Sauerwald, and Luca Zanetti. *Manuscript in preparation* (2020).

## Recent talks

Conference talk at the Annual European Symposium on Algorithms (ESA'19). Title: *Hermitian Laplacians and a Cheeger Inequality for the Max-2-Lin Problem* (09/2019).

Contributed talk at the 19th International Conference on Random Structures and Algorithms. Title: *Random walks on Dynamic Graphs* (07/2019).

Conference talk at the 46th International Colloquium on Automata, Languages, and Programming (ICALP'19). Title: *Random walks on Dynamic Graphs: Mixing Times, Hitting Times, and Return Probabilities* (07/2019).

Contributed talk at the Scottish Combinatorics Meeting, University of Edinburgh. Title: *Hermitian Laplacians and a Cheeger Inequality for the Max-2-Lin Problem* (04/2019).

Invited talk at the conference on Analysis of and Analysis on Networks, Teesside University. Title: *Random walks on Dynamic Graphs* (03/2019).

## Teaching experience

| | |
|---|---|
| 2018-2020 | *Advanced Topics in Machine Learning*, University of Cambridge<br>MPhil course. Co-lecturer. |
| 2019-2020 | *Probability and Computation*, University of Cambridge<br>Undergraduate course. Co-lecturer. |
| 2015 | *Advanced Algorithms*, University of Bristol<br>Advanced course for undergraduate and graduate students. Guest Lecturer. |
| 2017-2018 | *Discrete Mathematics*, *Computation Theory*, *Complexity Theory*, University of Cambridge<br>Undergraduate courses. Supervisor (small group teaching). |
| 2015-2017 | *Data Structures and Algorithms*, *Advanced Algorithms*, University of Bristol<br>Undergraduate and graduate courses. Teaching assistant. |
| 2014 | *Great Ideas in Theoretical Computer Science*, Saarland University, Germany<br>Advanced course for graduate students. Teaching assistant. |

## Student Advising

Co-supervisor of Daniel Sääw, Bachelor thesis, University of Cambridge (2019-20)

## Service

### Program committees

SPAA 2020, IJCAI 2020

### Reviewer for journals

IEEE Transactions on Information Theory 2019, Journal of Machine Learning Research 2019

### Reviewer for conferences

STACS 2020, FOCS 2019, APPROX 2019, ESA 2018, ICALP 2017, ESA 2016, CSR 2016, COCOON 2014

## Programming skills

MATLAB, Mathematica, Python, C, C++, Java, SQL

## Academic references

### He Sun

PhD supervisor. Senior Lecturer at the University of Edinburgh

### Thomas Sauerwald

PostDoc supervisor. Senior Lecturer at the University of Cambridge

### Raphaël Clifford

Head of the Theory Group at the University of Bristol