Amin Coja-Oghlan

Curriculum Vitae

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Personal and contact details

Born February 12, 1975 in Hamburg, Germany.
TU Dortmund, Faculty of Computer Science, Chair 2, Otto Hahn St 12, 44227 Dortmund

Employment

since 10/2021	Professor of *efficient algorithms and complexity theory*, TU Dortmund
7/2012–9/2021	Professor of *discrete applied mathematics*, Mathematics Institute, Goethe University
1/2010–6/2012	Associate Professor/Reader, University of Warwick, UK • Joint appointment at the Mathematics Institute/Department of Computer Science • Associated with the DIMAP centre for Discrete Mathematics and its Applications
2/2008–12/2009	Reader, School of Informatics, University of Edinburgh, UK
2/2007–1/2008	Heisenberg fellow, visiting Carnegie Mellon University, Pittsburgh, PA, USA
10/2001–1/2007	Department of Computer Science, Humboldt University, Berlin, Germany • Postdoctoral research associate: 10/2001–9/2003 and 4/2006–1/2007 • Visiting lecturer/professor: 10/2003–3/2006

Education

7/2005	Habilitation in Computer Science	Humboldt University Berlin
1/2002	PhD in Mathematics	University of Hamburg
8/1999	MSc in Mathematics (*Diplom*)	Freie Universität Berlin
1994	High school graduation (*Abitur*)	Wichern school, Hamburg

Honours and Awards

Nominated for Goethe university's best **PhD advisor award**, 2018
Invited speaker at the **7th European Congress of Mathematics**, Berlin, 2016
Best paper award at ICALP 2009 (track A)
Nominated for a **Edinburgh University Student Union teachnig award**, 2008

Research Grants

DFG 646-6 Sparse random combinatorial structures, 2023–26; joint initiative with Mihyun Kang, TU Graz
DFG 646-5 Reconstruction and learning in complext networks, 2020–2023; this project is part of DFG FOR 2975 (speaker: Prof. Martin Hoefer)
DFG 646-4 Random graphs: cores, colourings and contagion, 2018–22; joint initiative with Mihyun Kang, TU Graz (funded by FWF I3747)
DFG 646-3 Message passing algorithms, information-theoretic thresholds and computational barriers, 2018–2026
Aventis foundation Complexity in the sciences, culture and society, 2018–20; joint initiative with assorted researchers from the sciences and the humanities at Goethe.
European Research Council grant Phase transitions and computational complexity, 2011–2016
DAAD PROBRAL project Sparse random structures, 2014–2015; joint initiative with C. Fernandes, Y. Kohayakawa, Y. Person, M. Schacht, A. Taraz
Weizmann-UK grant for collaboration with the Weizmann Institute, 2010–2011; jointly with A. Czumaj, U. Feige, R. Krauthgamer, H. Räcke
EPSRC first grant Random structures, spin glasses, and efficient algorithms, 2009–2012
DFG Heisenberg fellowship, host: A. Frieze, Carnegie Mellon University
Royal Society International Joint Project (jointly with Colin Cooper, King's College London)

Research

My research deals with *probabilistic combinatorics* and its ramifications in computer science, statistical physics and statistics. Thus far my work has led to over 60 peer-reviewed journal publications. Many of my papers appeared in renown journals such as *Advances in Mathematics*, *Combinatorica*, *Random Structures and Algorithms*, *Combinatorics, Probability and Computing*, *Journal of the ACM*, *SIAM Journal on Computing* or *Communications in Mathematical Physics*. Additionally, I have been publishing numerous contributions in the proceedings of leading computer science conferences such as *FOCS*, *STOC*, *SODA* or *COLT*.

Teaching

I have had the pleasure and privilege of teaching modules at all levels since 2002. Additionally, I gave invited lecture series to at graduate schools on several occasions:

- Graduate school 'Mathematics meets physics on disordered systems', Cortona, Italy, 2020
- Open Online Probability School: 'Disordered systems and random graphs', 2020
- Recent progress in glassy systems: 'Mathematical methods for diluted mean-field models', École de physique des Houches, 2020
- YEP XIV on Networks: 'Probability, combinatorics and algorithms', Eurandom, Eindhoven, 2017
- Summer school 'Random constraint satisfaction', Hausdorff Center for Mathematics in Bonn, 2017
- Summer school 'Techniques in random discrete structures', National and Kapodistrian University of Athens, 2017.
- 'Spin glasses: an old tool for new problems', Institut d'études scientifiques de Cargese, 2014.
- Autumn school 'Statistical physics, optimization, inference and message-passing algorithms', École de physique des Houches, 2013.
- Fall school 'Phase transition in random discrete structures', TU Graz, 2013.
- School on Mathematical Statistical Physics, Charles University, Prague, 2013.
- Algorithms and Randomness Center, Georgia Tech, Atlanta, 2013.
- Graduate School 'New algorithmic paradigms in optimization', ETH Zurich, 2008.

Editorial responsibilities and programme committees

From 2015 until 2019 I was a member of the editorial board of the *SIAM Journal on Discrete Mathematics*. Since 2020 I have been a member of the editorial board of *Random Structures and Algorithms* and as of 2021 I serve on the editorial board of the *Transaction of the London Mathematical Society*. Moreover, I served on the programme committees of several international conferences:

- the *ACM-SIAM Symposium on Discrete Algorithms* ('SODA') in 2014, 2018 and 2023
- the *European Conference on Combinatorics, Graph Theory and Applications* ('EUROCOMB') in 2017,
- the *International Colloquium on Automata, Languages and Programming* ('ICALP') in 2010 and 2012,
- the *International Workshop on Randomization and Computation* ('RANDOM') in 2006, 2008, 2011 and 2014,
- the *Meeting on Analytic Algorithmics and Combinatorics* ('ANALCO') in 2013.

Selected publications

Amin Coja-Oghlan, Oliver Gebhard, Max Hahn-Klimroth, Philipp Loick: Optimal group testing. Combinatorics, Probability and Computing **30** (2021) 811–848.

Amin Coja-Oghlan, Alperen Ergür, Pu Gao, Samuel Hetterich, Maurice Rolvien: The rank of sparse random matrices. Proc. 31st SODA (2020) 579–591.

Peter Ayre, Amin Coja-Oghlan, Jane Gao, Noëla Müller: The satisfiability threshold for random linear equations. Combinatorica **40** (2020) 179–235.

Amin Coja-Oghlan, Florent Krzakala, Will Perkins, Lenka Zdeborová: Information-theoretic thresholds from the cavity method. Advances in Mathematics **333** (2018) 694–795.

Amin Coja-Oghlan, Charilaos Efthymiou, Nor Jaafari, Mihyun Kang, Tobias Kapetanopoulos: Charting the replica symmetric phase. Communications in Mathematical Physics **359** (2018) 603-698.

Amin Coja-Oghlan: Belief Propagation Guided Decimation fails on random formulas. Journal of the Association for Computing Machinery **63** (2017) 49:1–55.

Amin Coja-Oghlan, Konstantinos Panagiotou: The asymptotic k-SAT threshold. Advances in Mathematics **288** (2016) 985–1068.

Amin Coja-Oghlan, Dan Vilenchik: Chasing the k-colorability threshold. Proc. 54th FOCS (2013) 380–389.

Amin Coja-Oghlan: A better algorithm for random k-SAT. SIAM Journal on Computing **39** (2010) 2823–2864.

Dimitris Achlioptas, Amin Coja-Oghlan: Algorithmic barriers from phase transitions. Proc. 49th FOCS (2008) 793–802.