

Marcin Wrochna

Employment

- 2021 – · Senior expert in Deep Learning at MIM Solutions
- 2021 – · Assistant prof. (adiunkt) at the University of Warsaw, MIMUW
- 2019, 2020 Postdoc at the University of Oxford, Department of Computer Science

Education

- September 2014 – 2018 **PhD studies in Computer Science**, *University of Warsaw*, Faculty of Mathematics, Informatics and Mechanics.
Thesis: The topology of solution spaces of combinatorial problems, co-advisor: Michał Pilipczuk, advisor: Marcin Pilipczuk. Defended with honors, degree *doktor nauk matematycznych w zakresie informatyki* (PhD) awarded: 2018-11-29
- September 2012 – June 2014 **Master in Computer Science**, *University of Warsaw*, Faculty of Mathematics, Informatics and Mechanics.
Thesis: Reconfiguration and structural graph theory, advisor Marcin Kamiński, defended with honors.
- September 2009 – June 2012 **Bachelor in Computer Science**, *University of Warsaw*, Faculty of Mathematics, Informatics and Mechanics.
As part of interfaculty studies at the College of Inter-Faculty Individual Studies in Mathematics and Natural Sciences, where I additionally attended most courses of *individualised studies* (an advanced programme) at the Faculty of Physics.

Work in grants

- 2019 – 2020 Investigator in ERC Starting Grant *PowAlgDO* led by Standa Živný.
- 2017 – 2019 Principal Investigator in PRELUDIUM research grant *The topology of solution spaces of combinatorial problems* funded by the Polish National Science Center.
- 2017 – 2018 Investigator in ERC Starting Grant *CUTACOMBS* led by Marcin Pilipczuk.
- 2014 – 2017 Investigator in SONATA research grant *Optimality in Parameterized Complexity* led by Michał Pilipczuk, funded by the Polish National Science Center.
- 2012 – 2014 Investigator in Homing Plus research grant *Graphs within graphs: algorithmic and combinatorial aspects of graph containment relations* led by Marcin Kamiński, funded by the Foundation for Polish Science.

Awards and scholarships

- 2020 Open Mind Prize at the Polish Combinatorial Conference
- 2019 Polish Prime Minister's award for outstanding doctoral dissertation
- 2019 Finalist of the ERCIM Cor Baayen Young Researcher Award
- 2017 START stipend for young, talented researchers, funded by the Foundation for Polish Science
- 2016 Young Author Prize at the Bordeaux Graph Workshop for "*Square-free graphs are multiplicative*"
- 2016 Best paper award at IPEC 2016 for "*Cutwidth: obstructions and algorithmic aspects*" (joint work with Archontia Giannopoulou, Michał Pilipczuk, Jean-Florent Raymond, Dimitrios Thilikos)

- 2014 Second award (ex aequo) in the XXXI competition for best master thesis in computer science in Poland in 2014, organized by Polskie Towarzystwo Informatyczne (PTI).
- 2010-2014 Scholarship for academic achievements (*studia zamawiane*)
- 2013-2014 Dean's scholarship for academic achievements
- 2009 Laureate of the 16th Polish Computing Olympiad
- 2009 Finalist of the 58th Polish Physics Olympiad

Research visits

- 2019 2 weeks with Andrei Krokhin and Jakub Opršal at Durham University
- 2017 5 weeks with Daniel Král', Taísa L. Martins and Péter Pál Pach at the University of Warwick, DIMAP Centre
- 2017 1 week with Claude Tardif at Queen's University, Kingston, Ontario
- 2016 2 weeks at the Bergen Algorithms Research Group, Norway
- 2016 2 weeks with Marthe Bonamy at LaBRI (Laboratoire Bordelais de Recherche en Informatique) in Bordeaux, France
- 2015 1 week with Fedor V. Fomin, Daniel Lokshtanov and Saket Saurab at the Bergen Algorithms Research Group, Norway
- 2014 2 weeks with Naomi Nishimura and Amer Mouawad at the University of Waterloo, Canada

Community service

Supervision

- 2020 – · MSc student: Konstanty Kostrzewski
- 2020 research internship of Oxford undergraduate Piotr Mitosek

Reviews for journals

- 2022 Information Sciences, El. J. Comb., DAM, TALG
- 2021 JGT, IPL, Eur. J. Comb., DAM, Algorithmica, J. Eur. Math. Soc.
- 2020 ACM TOCT, Algorithmica, 2×El. J. Comb.
- 2019 JCTB, SIDMA, Combinatorica, El. J. Comb., Eur. J. Comb, Algorithmica, DM
- 2018 2×ACM TALG, JGT, JOCO, TCS
- 2017 SIDMA, AMC, Algorithmica, 3×DM, 2×TCS
- 2016 JCTB, TALG, JCSS, Algorithmica, IPL, DO, 2×DM, TCS
- 2015 SIDMA, Eur. J. Comb, JDA, Algorithmica, DAM, DO, 2×TCS
- 2014 IEICE Trans.

Reviews for conferences

- 2022 SODA, LICS
- 2021 FOCS, SODA, ICALP, LICS, ESA, FSCD
- 2020 2×SODA, 3×ICALP, 2×STACS, SoCG, ISAAC, 2×MFCS, WG
- 2019 2×SODA, ICALP, ESA, MFCS, ISAAC, WG
- 2018 SODA, ICALP, 4×STACS, 2×ESA, 3×ISAAC, WG
- 2017 4×SODA, 2×ICALP, 2×STACS, 2×IPEC, 2×MFCS, ISAAC, COCCON, ESA

- 2016 ICALP, 2×STACS, SIAM DM, 3×ESA, 2×IPEC, COCOON, FSTTCS, SWAT, WG
2015 ICALP, ESA, LATIN, WALCOM
2014 SODA, ICALP

Publications

See <https://mimuw.edu.pl/~mwrochna>

Conference presentations

(At refereed international conferences and workshops, as the only speaker.)

- **Treewidth-Pliability and PTAS for Max-CSPs**
ACM-SIAM Symposium on Discrete Algorithms (SODA 2021)
January 10–13, 2021, USA/online
- **Sallow: a heuristic algorithm for treedepth decompositions**
Parameterized Algorithms and Computational Experiments Challenge (PACE 2020)
December 17, 2020, Hong Kong/online
- **The complexity of promise SAT on non-Boolean domains**
47th Int. Colloquium on Automata, Languages and Programming (ICALP 2020)
July 8–11, 2020, China/Germany/online
- **Improved hardness for H-colourings of G-colourable graphs**
ACM-SIAM Symposium on Discrete Algorithms (SODA 2020)
January 5–8, 2020, Salt Lake City, Utah, USA
- **Graph structure useful for approximating MaxCSPs**
Theory Underlying Algorithms workshop (TUNGA)
January 5–8, 2020, Salt Lake City, Utah, USA
- **Tight complexity lower bounds for integer linear programming with few constraints**
36th Symposium on Theoretical Aspects of Computer Science (STACS 2019)
March 13–16, 2019, Berlin, Germany
- **Fully polynomial-time parameterized computations for graphs and matrices of low treewidth**
ACM-SIAM Symposium on Discrete Algorithms (SODA 2017)
January 16–19, 2017, Barcelona, Spain
- **A Topological Approach Related to Hedetniemi’s Conjecture**
SIAM Conference on Discrete Mathematics (SIAM DM 2016)
June 6–10, 2016, Atlanta, Georgia, USA
(based on the paper *Square-free graphs are multiplicative*).
- **On space efficiency of algorithms working on structural decompositions of graphs**
33rd Symposium on Theoretical Aspects of Computer Science (STACS 2016)
February 17–20, 2016, Orléans, France
- **On space efficiency of algorithms working on structural decompositions of graphs**
7th Workshop on Graph Classes, Optimization and Width Parameters (GROW 2015)
October 11–15, 2015, Aussois, France
- **Homomorphism reconfiguration via homotopy**
32nd Symposium on Theoretical Aspects of Computer Science (STACS 2015)
March 4–7, 2015, Munich, Germany.

- **Reconfiguring independent sets in claw-free graphs**
14th Scandinavian Symposium and Workshops (SWAT 2014),
July 2–4, 2014, Copenhagen, Denmark

■ Seminar talks

- **Topology in promise constraint satisfaction**
University of Colorado Boulder, Ulam Seminar, February 4, 2021
- **An algorithmist's journey through topology**
University of Warsaw, seminar in algebraic topology, December 1, 2020
- **Understanding homomorphism approximation problems using topology**
Chennai Mathematical Institute, Combinatorics in Algebra, Topology and Graph Theory (CATGT), October 28, 2020
- **Applying topology in graph colouring and constraint satisfaction problems**
Durham University, Algorithms and Complexity in Durham (ACiD) Seminar
January 14, 2020
- **Graph structure that allows approximating Max-CSPs**
IGAFIT Workshop for Algorithms Postdocs in Europe (AlgPiE by IGAFIT 2019)
October 16, 2019
- **Recolouring and homomorphism reconfiguration**
University of Oxford, Algorithms Seminar, January 17, 2019
- **Ekwiwariantne odwzorowania produktów przestrzeni w sferę, a teoria grafów**
Equivariant maps from products of spaces to spheres, and graph theory
IMPAN, Topology seminar, November 19, 2018
- **Coloring graph products and Hedetniemi's conjecture**
University of Warwick, DIMAP Centre, UK, October 3, 2017
- **A topological approach related to Hedetniemi's conjecture**
University of Warsaw, Algorithms Seminar, April 20, 2017
- **Square-free graphs are multiplicative**
Adam Mickiewicz University, Discrete Maths, Poznań, Poland, February 28, 2017
- **Coloring graph products by looking at spaces of colorings**
Warsaw University of Technology, Combinatorics, Graph and Poset Theory Seminar,
Warsaw, Poland, December 7, 2016
- **Recolorer des homomorphismes de graphes via de la topologie élémentaire**
University of Bordeaux, LaBRI, GT Graphs and Optimization, November 4, 2016
- **Algorithms for graphs and matrices in $\text{poly}(\text{tw}) \cdot n$ time**
Bergen Algorithms Research Group, Norway, October 21, 2016