Curriculum Vitæ

Personal data

Name	Marek Cygan
Born	10th July 1984 in Bydgoszcz, Poland
Citizenship	Polish
Address	Institute of Informatics, Banacha 2, 02-097 Warszawa, Poland
e-mail	cygan@mimuw.edu.pl
www	http://www.mimuw.edu.pl/~cygan/

Education

2008-2012 Ph.D. in Computer Science, University of Warsaw
Research areas: fixed parameter tractability, approximation algorithms, exact exponential algorithms.

Thesis advisor: Łukasz Kowalik (kowalik@mimuw.edu.pl).

Thesis *Cut&Count technique for graph connectivity problems parameterized by treewidth.*

2003-2008 M.Sc. in Computer Science, University of Warsaw
M.Sc. Thesis *New algorithms solving the Bandwidth problem*
Thesis co-author: Marcin Pilipczuk.
Thesis advisor: Łukasz Kowalik.

Positions

10/2012-currently	assistant professor at the Institute of Informatics, University of Warsaw
01/2012-10/2012	post-doc at IDSIA, University of Lugano, Switzerland
07/2011-12/2011	research assistant at the University of Maryland, College Park, USA
01/2008-12/2008	half-time software engineer in Advanced Digital Broadcast Poland (Research & Development), Warsaw, Poland
07/2007-09/2007	summer internship, Google, Mountain View, USA
07/2006-09/2006	summer internship, NVIDIA, Santa Clara, USA

Program committees

2014	9th International Symposium on Parameterized and Exact Computation (IPEC 2014) - **co-chair**
2014	25th ACM-SIAM Symposium on Discrete Algorithms (SODA 2014)
2012	7th International Symposium on Parameterized and Exact Computation (IPEC 2012)

Awards

2013	Prime Minister award for PhD thesis
2012	Witold Lipski Prize for Young Researchers in Computer Science
2012	Best student paper award for *On group feedback vertex set parameterized by the size of the cutset* (co-authors: Marcin Pilipczuk, Michał Pilipczuk) at the 38th Workshop on Graph-Theoretic Concepts in Computer Science (WG 2012)
2012	Best student paper award for *Deterministic Parameterized Connected Vertex Cover* at the 13th Scandinavian Symposium and Workshops on Algorithm Theory (SWAT 2012)
2011, 2012	„START" scholarship, given by Foundation for Polish Science
2010	„Doktoraty dla Mazowsza" scholarship
2009	„Nowoczesny Uniwersytet" scholarship
2008	M.Sc. thesis (co-author Marcin Pilipczuk) was awarded the first prize in the 25th Contest of the Polish Information Processing Society for the best M.Sc. thesis in computer science
2008	Best student paper award for *Faster Exact Bandwith* (co-author Marcin Pilipczuk) at the 34th Workshop on Graph-Theoretic Concepts in Computer Science (WG 2008)
2004–2008	Ministry of Education scholarship (2004/2005, 2005/2006, 2006/2007, 2007/2008)

Programming competitions

2010	Google Code Jam 2010 – 5th place
2009	TopCoder Open Finals 2009 – 3rd place
2007	World Finals of the ACM International Collegiate Programming Contest – 1st place
2004–2007	Central European Regional Contest of ACM ICPC: 2004 – 2nd place, 2005 – 2nd place, 2006 – 1st place, 2007 – 1st place
2005	Google Code Jam 2005 – 1st place

Invited talks

2013 UiB Winter School, Ustaoset, Norway
2013 8th International Symposium on Parameterized and Exact Computation - IPEC 2013 (tutorial)
2013 Workshop on Quantum and Classical Complexity, Riga, Latvia
2011 Treewidth Workshop, Bergen, Norway

Researcher in grants

2013–Present	Foundation for Polish Science grant HOMING PLUS/2012-6/2 *Approximation and parameterized local search algorithms*, coordinator: Marek Cygan
2013–Present	Grant no. 2012/05/D/ST6/03214 *Parameterized algorithms in graph problems and permutation pattern matching*, coordinator: Marek Cygan
2011–2013	Grant no. N206 567140 *Parameterized complexity and exponential algorithms*, coordinator: Łukasz Kowalik
2011–2013	Grant no. N206 567940 *Stochastic online algorithms*, coordinator: Marcin Mucha
2010–2012	Grant no. N206 491238 *Moderately exponential time exact and approximation algorithms*, coordinator: Krzysztof Diks
2009–2011	Grant no. N206 355636 *Approximation algorithms with limited resources*, coordinator: Piotr Sankowski
2008–2009	Polish-Slovenian bilateral project *Graph colorings and their applications*, coordinator: Łukasz Kowalik
2007–2009	Grant no. N206 005 32/0807, *New techniques in graph algorithms: exact algorithms for NP-hard problems, sparse graphs and their applications*, coordinator: Łukasz Kowalik

Journal publications

1. *Steiner Forest Orientation Problems*, (co-authors: Guy Kortsarz, Zeev Nutov), SIAM Journal on Discrete Mathematics, 2013, to appear.

   Extended abstract: *Steiner Forest Orientation Problems*, (co-authors: Guy Kortsarz, Zeev Nutov), 20th Annual European Symposium on Algorithms (ESA 2012). Proceedings, LNCS 7501, 361-372.

2. *Subset Feedback Vertex Set is Fixed-Parameter Tractable*, (co-authors: Marcin Pilipczuk, Michał Pilipczuk, Jakub Wojtaszczyk), SIAM Journal on Discrete Mathematics, 27(1), 2013, 290-309.

   Extended abstract: *Subset Feedback Vertex Set is Fixed-Parameter Tractable*, (co-authors: Marcin Pilipczuk, Michał Pilipczuk, Jakub Wojtaszczyk), Automata, Languages and Programming - 38th International Colloquium (ICALP 2011). Proceedings, LNCS 6755, 449-461.

3. *On Multiway Cut parameterized above lower bounds*, (co-authors: Marcin Pilipczuk, Michał Pilipczuk, Jakub Wojtaszczyk), ACM Transactions on Computation Theory (TOCT), 5(1): 3, 2013.

   Extended abstract: *On Multiway Cut parameterized above lower bounds*, (co-authors: Marcin Pilipczuk, Michał Pilipczuk, Jakub Wojtaszczyk), 6th International Symposium on Parameterized and Exact Computation (IPEC 2011). Proceedings, LNCS 7112, 1-12.

4. *Parameterized complexity of Eulerian deletion problems*, (co-authors: Marcin Pilipczuk, Dániel Marx, Michał Pilipczuk, Ildiko Schlotter), Algorithmica, to appear.

   Extended abstract: *Parameterized complexity of Eulerian deletion problems*, (co-authors: Marcin Pilipczuk, Dániel Marx, Michał Pilipczuk, Ildiko Schlotter), 37th International Workshop on Graph-Theoretic Concepts in Computer Science (WG 2011). Proceedings, LNCS 6986, 131-142.

5. *Scheduling partially ordered jobs faster than* 2^n, (co-authors: Marcin Pilipczuk, Michał Pilipczuk, Jakub Wojtaszczyk), Algorithmica, to appear.

   Extended abstract: *Scheduling partially ordered jobs faster than* 2^n, (co-authors: Marcin Pilipczuk, Michał Pilipczuk, Jakub Wojtaszczyk), 19th European Symposium on Algorithms (ESA 2011). Proceedings, LNCS 6942, 299-210.

6. *Split Vertex Deletion meets Vertex Cover: New fixed-parameter and exact exponential-time algorithms*, (co-author: Marcin Pilipczuk), Information Processing Letters 113(5-6), 2013, 179-182.

7. *A bound on the number of perfect matchings in klee-graphs. Discrete Mathematics* (co-authors: Marcin Pilipczuk, Riste Škrekovski), Discrete Mathematics & Theoretical Computer Science, 15(1), 2013, 37-54.

8. *A Polynomial Algorithm for 3-Compatible Coloring and the Stubborn List Partition Problem (The Stubborn Problem Is Stubborn No More)* (co-authors: Marcin Pilipczuk, Michał Pilipczuk, Jakub Wojtaszczyk), SIAM Journal on Computing 41(4), 2012, 815-828.

   Extended abstract: *The Stubborn Problem is stubborn no more (a polynomial algorithm for 3-compatible colouring and the stubborn list partition problem)*, (co-authors: Marcin Pilipczuk, Michał Pilipczuk, Jakub Wojtaszczyk), ACM-SIAM Symposium on Discrete Algorithms (SODA 2011). Proceedings, 1666-1674.

9. *Improved FPT algorithm and quadratic kernel for Pathwidth One Vertex Deletion*, (co-authors: Marcin Pilipczuk, Michał Pilipczuk, Jakub Wojtaszczyk), Algorithmica, 64(1), 2012, 170-188.

   Extended abstract: *Improved FPT algorithm and quadratic kernel for Pathwidth One Vertex Deletion*, (co-authors: Marcin Pilipczuk, Michał Pilipczuk, Jakub Wojtaszczyk), International Symposium on Parameterized and Exact Computation (IPEC 2010), Proceedings, LNCS 6478, 95-106.

10. *On the Inequality between Radius and Randic Index for Graphs*, (co-authors: Michał Pilipczuk, Riste Škrekovski), MATCH Communications in Mathematical and in Computer Science Chemistry, 67(2), 2012.

11. *Bandwidth and Distortion revisited*, (co-author: Marcin Pilipczuk), Discrete Applied Mathematics, 160(4-5), 2012, 494-504.

12. *Kernelization hardness of connectivity problems in d-degenerate graphs*, (co-authors: Marcin Pilipczuk, Michał Pilipczuk, Jakub Wojtaszczyk), Discrete Applied Mathematics 160(15), 2131-2141, 2012.

    Extended abstract: *Kernelization hardness of connectivity problems in d-degenerate graphs*, (co-authors: Marcin Pilipczuk, Michał Pilipczuk, Jakub Wojtaszczyk), 36th International Workshop on Graph Theoretic Concepts in Computer Science (WG 2010). Proceedings, LNCS 6410, 147-158.

13. *Channel Assignment via Fast Zeta Transform*, (co-author: Łukasz Kowalik), Information Processing Letters 2011, 111 (15), 727-730.

14. *Dominating Set is Fixed Parameter Tractable in Claw-free Graphs*, (co-authors: Marcin Pilipczuk, Geevarghese Philip, Michał Pilipczuk, Jakub Wojtaszczyk) Theoretical Computer Science 412(50):6982-7000, 2011.

15. *Relation between Randić index and average distance of trees*, (co-authors: Michał Pilipczuk, Riste Škrekovski), MATCH, Communications in Mathematical and in Computer Science Chemistry, 66(2) (2011).

16. *Even Faster Exact Bandwidth*, (co-author: Marcin Pilipczuk), ACM Transactions on Algorithms, 8(1), 2012.

    Extended abstract: *Faster Exact Bandwidth*, (co-author: Marcin Pilipczuk), 34th Workshop on Graph-Theoretic Concepts in Computer Science (WG 2008), Proceedings, LNCS 5344, 101-109.

17. *A Planar Linear Arboricity Conjecture*, (co-authors: Jian-Feng Hou, Łukasz Kowalik, Borut Luzar, Jian-Liang Wu) Journal of Graph Theory 69(4), 2012, 403-425.

    Extended abstract: *A Planar Linear Arboricity Conjecture*, (co-authors: Łukasz Kowalik, Borut Luzar), Algorithms and Complexity, 7th International Conference (CIAC 2010). Proceedings, LNCS 6078, 204-216.

18. *Breaking the 2^n-barrier for Irredundance: Two lines of attack*, (co-authors: Daniel Binkele-Raible, Ljiljana Brankovic, Marcin Pilipczuk, Henning Fernau, Joachim Kneis, Dieter Kratsch, Alexander Langer, Mathieu Liedloff, Peter Rossmanith, Jakub Wojtaszczyk), Journal of Discrete Algorithms 9(3): 214-230, 2011.

    Extended abstract: *Irredundant set faster than $O(2^n)$*, (co-authors: Marcin Pilipczuk, Jakub Wojtaszczyk), Algorithms and Complexity, 7th International Conference (CIAC 2010). Proceedings, LNCS 6078, 288-298.

19. *Capacitated domination faster than $O(2^n)$*, (co-authors: Marcin Pilipczuk, Jakub Wojtaszczyk), Information Processing Letters 111(23-24):1099-1103, 2011.

    Extended abstract: *Capacitated domination faster than $O(2^n)$*, (co-authors: Marcin Pilipczuk, Jakub Wojtaszczyk), 12th Scandinavian Symposium and Workshops on Algorithm Theory (SWAT 2010). Proceedings, LNCS 6139, 74- 80.

20. *Exact and Approximate Bandwidth*, (co-author: Marcin Pilipczuk), Theoretical Computer Science 411 (2010), 3701-3713.

    Extended abstract: *Exact and Approximate Bandwidth*, (co-author: Marcin Pilipczuk), Automata, Languages and Programming, 36th International Colloquium (ICALP 2009). Proceedings, Part I, LNCS 5555, 304-315.

21. *Exponential-Time Approximation of Weighted Set Cover*, (co-authors: Łukasz Kowalik, Mateusz Wykurz), Information Processing Letters, 109, 2009, 957-961,

Conference publications (without journal version)

22. *Improved approximation for 3-dimensional matching via bounded pathwidth local search*, to appear in 54th Annual Symposium on Foundations of Computer Science (FOCS 2013).

23. *The planar directed k-Vertex-Disjoint Paths problem is fixed parameter tractable*, (co-authors: Dániel Marx, Marcin Pilipczuk, Michał Pilipczuk), to appear in 54th Annual Symposium on Foundations of Computer Science (FOCS 2013).

24. *Online Knapsack Revisited*, (co-author: Łukasz Jeż), to appear in 11th Workshop on Approximation and Online Algorithms (WAOA 2013).

25. *Tight Kernel Bounds for Problems on Graphs with Small Degeneracy - (Extended Abstract)*, (co-authors: Fabrizio Grandoni, Danny Hermelin), 21st Annual European Symposium on Algorithm (ESA 2013), Proceedings, 361-372.

26. *Fast Hamiltonicity checking via bases of perfect matchings*, (co-authors: Stefan Kratsch, Jesper Nederlof), 45th ACM Symposium on the Theory of Computing (STOC 2013), Proceedings, 301-310.

27. *Known algorithms for Edge Clique Cover are probably optimal*, (co-authors: Marcin Pilipczuk, Michał Pilipczuk), ACM-SIAM Symposium on Discrete Algorithms (SODA 2013), Proceedings, 1044-1053.

28. *How to Sell Hyperedges: The Hypermatching Assignment Problem*, (co-authors: Fabrizio Grandoni, Monaldo Mastrolili), ACM-SIAM Symposium on Discrete Algorithms (SODA 2013), Proceedings, 342-351.

29. *Deterministic Single Exponential Time Algorithms for Connectivity Problems Parameterized by Treewidth*, (co-authors: Hans Bodlaender, Stefan Kratsch, Jesper Nederlof), Automata, Languages and Programming - 40th International Colloquium (ICALP 2013), Proceedings, 196-207.

30. *Faster exponential-time algorithms in graphs of bounded average degree*, (co-author: Marcin Pilipczuk), Automata, Languages and Programming - 40th International Colloquium (ICALP 2013), Proceedings, 364-375.

31. *Catch them if you can: how to serve impatient users*, (co-authors: Matthias Englert, Anupam Gupta, Marcin Mucha, Piotr Sankowski), Innovations in Theoretical Computer Science (ITCS 2013), Proceedings, 485-494.

32. *On Pairwise Spanners*, (co-authors: Fabrizio Grandoni, Telikepalli Kavitha), 30th International Symposium on Theoretical Aspects of Computer Science (STACS 2013), Proceedings, LIPIcs 20, 209-220.

33. *Designing FPT algorithms for cut problems using randomized contractions*, (co-authors: Rajesh Chitnis, Mohammadtaghi Hajiaghayi, Marcin Pilipczuk, Michał Pilipczuk), 53rd Annual IEEE Symposium on Foundations of Computer Science (FOCS 2012), Proceedings, 460-469.

34. *LP Rounding for k-Centers with Non-uniform Hard Capacities*, (co-authors: Mohammadtaghi Hajiaghayi, Samir Khuller), 53rd Annual IEEE Symposium on Foundations of Computer Science (FOCS 2012), Proceedings, 273-282.

35. *Algorithmic Applications of Baur-Strassen's Theorem: Shortest Cycles, Diameter and Matchings*, (co-authors: Harold N. Gabow, Piotr Sankowski), 53rd Annual IEEE Symposium on Foundations of Computer Science (FOCS 2012), Proceedings, 531-540.

36. *Directed Subset Feedback Vertex Set is Fixed-Parameter Tractable*, (co-authors: Rajesh Chitnis, Mohammadtaghi Hajiaghayi, Dániel Marx), Automata, Languages and Programming - 39th International Colloquium (ICALP 2012). Proceedings, LNCS 7391, 230-241.

37. *Clique cover and graph separation: New incompressibility results*, (co-authors: Marcin Pilipczuk, Stefan Kratsch, Michał Pilipczuk, Magnus Wahlström), Automata, Languages and Programming - 39th International Colloquium (ICALP 2012). Proceedings, LNCS 7391, 254-265.

38. *A Path-Decomposition Theorem with Applications to Pricing and Covering on Trees*, (co-authors: Fabrizio Grandoni, Stefano Leonardi, Marcin Pilipczuk, Piotr Sankowski), 20th Annual European Symposium on Algorithms (ESA 2012). Proceedings, LNCS 7501, 349-360.

39. *Sitting Closer to Friends Than Enemies, Revisited*, (co-authors: Marcin Pilipczuk, Michał Pilipczuk, Jakub Wojtaszczyk), Mathematical Foundations of Computer Science 2012 - 37th International Symposium (MFCS 2012). Proceedings, LNCS 7464, 296-307.

40. *On Problems as Hard as CNF-Sat* (co-authors: Holger Dell, Daniel Lokshtanov, Dániel Marx, Jesper Nederlof, Yoshio Okamoto, Ramamohan Paturi, Saket Saurabh, Magnus Wahlstrom) 27th Conference on Computational Complexity (CCC 2012). Proceedings, 74-84.

41. *Solving the 2-Disjoint Connected Subgraphs problem faster than* 2^n, (co-authors: Marcin Pilipczuk, Michał Pilipczuk, Jakub Wojtaszczyk), Theoretical Informatics - 10th Latin American Symposium (LATIN 2012). Proceedings, LNCS 7256, 195-206.

42. *Deterministic parameterized connected vertex cover*, 13th Scandinavian Symposium and Workshops on Algorithm Theory (SWAT 2012). Proceedings, LNCS 7357, 95-106.

43. *On group feedback vertex set parameterized by the size of the cutset*, (co-authors Marcin Pilipczuk i Michał Pilipczuk), 38th Workshop on Graph-Theoretic Concepts in Computer Science (WG 2012). Proceedings, LNCS 7551, 194-205.

44. *Solving connectivity problems parameterized by treewidth in single exponential time*, (co-authors: Marcin Pilipczuk, Jesper Nederlof, Michał Pilipczuk, Johan M.M. van Rooij, Jakub Wojtaszczyk), 52nd Annual IEEE Symposium on Foundations of Computer Science (FOCS 2011). Proceedings, 150-150.

45. *Parameterized Complexity of Firefighting Revisited*, (co-authors: Fedor Fomin, Erik Jan Van Leeuwen), 6th International Symposium on Parameterized and Exact Computation (IPEC 2011). Proceedings, LNCS 7112, 13-26.

46. *On the hardness of losing width*, (co-authors: Marcin Pilipczuk, Daniel Lokshtanov, Michał Pilipczuk, Saket Saurabh), 6th International Symposium on Parameterized and Exact Computation (IPEC 2011). Proceedings, LNCS 7112, 159-168.

47. *On cutwidth parameterized by vertex cover*, (co-authors: Marcin Pilipczuk, Daniel Lokshtanov, Michał Pilipczuk, Saket Saurabh), 6th International Symposium on Parameterized and Exact Computation (IPEC 2011). Proceedings, LNCS 7112, 246-258.

48. *Polynomial-Time Approximation Algorithms for Weighted LCS Problem*, (co-authors: Marcin Kubica, Jakub Radoszewski, Wojciech Rytter, Tomasz Waleń) 22nd Annual Symposium on Combinatorial Pattern Matching (CPM 2011). Proceedings, LNCS, 6661, 455-466.

49. *Approximation algorithms for union and intersection covering problems*, (co-authors: Marcin Pilipczuk, Fabrizio Grandoni, Stefano Leonardi, Marcin Mucha, Piotr Sankowski), Foundations of Software Technology and Theoretical Computer Science (FSTTCS 2011). Proceedings, 28-40.

50. *Algorithms for Three Versions of the Shortest Common Superstring Problem*, (co-authors: Maxime Crochemore, Costas S. Iliopoulos, Marcin Kubica, Jakub Radoszewski, Wojciech Rytter, Tomasz Waleń), Combinatorial Pattern Matching, 21st Annual Symposium (CPM 2010). Proceedings, LNCS 6129, 299-309.

51. *Fast Approximation in Subspaces by Doubling Metric Decomposition*, (co-authors: Marcin Pilipczuk, Łukasz Kowalik, Marcin Mucha, Piotr Sankowski), 18th Annual European Symposium on Algorithms (ESA 2010). Proceedings, LNCS 6346, 72-83.

Short research visits (1-3 weeks)

08.2012 Hungarian Academy of Sciences (MTA SZTAKI), Budapest, Hungary, Scientific collaboration with Dániel Marx

10.2011 Carnegie Mellon University, Pittsburth, USA, Scientific collaboration with Anupam Gupta and Krzysztof Onak

05.2011 University of Bergen, Norway, Scientific collaboration with Fedor Fomin

03.2011 University of Bergen, Norway, Scientific collaboration with Fedor Fomin

09.2010 La Sapienza University of Rome, Italy, Scientific collaboration with Stefano Leonardi and Fabrizio Grandoni

05.2010 University in Ljubljana, Slovenia, Scientific collaboration with Riste Škrekovski

03.2010 La Sapienza University of Rome, Italy, Scientific collaboration with Stefano Leonardi and Fabrizio Grandoni

09.2009 La Sapienza University of Rome, Italy, Scientific collaboration with Stefano Leonardi and Fabrizio Grandoni

03.2009 University in Ljubljana, Slovenia, Scientific collaboration with Riste Škrekovski