

My name is Zdeněk Dvořák. I was born on April 26, 1981 in Nové Město na Moravě, Czech Republic. Currently I am an associate professor at Charles University in Prague. My research interests include graph and hypergraph coloring and generalizations of coloring, graph homomorphisms, structure of graphs on surfaces and various algorithmic questions related to the graph theory.

Contact information

My home address is

Podlouckého 1035
Nové Město na Moravě
592 31
Czech Republic

My email address is `rakdver@iuuk.mff.cuni.cz`.

Education

- Obtained Master Degree (Mgr) (summa cum laude) in Computer Science at Faculty of Mathematics and Physics of Charles University, Prague, in September 2004. Defended a theses on the topic of Graph Homomorphisms with Local Constraints, advisor Jaroslav Nešetřil.
- I obtained PhD degree at Faculty of Mathematics and Physics of Charles University, Prague in May 2007. The topic of my PhD thesis was Asymptotical Structure of Combinatorial Objects. My advisor was Jaroslav Nešetřil.
- Habilitation (Doc. degree) at Faculty of Mathematics and Physics of Charles University, Prague in January 2013. The topic of my habilitation thesis was New Techniques in Coloring Embedded Graphs.

Employment history

- associate professor at Computer Science Institute, Charles University, Prague (2013-now)
- assistant professor at Computer Science Institute, Charles University, Prague (2012)
- assistant professor at Department of Applied Mathematics, Charles University, Prague (2011)
- postdoc at Simon Fraser University, Vancouver, BC, Canada (2008–2009)
- postdoc at Georgia Institute of Technology, Atlanta, GA, USA (2007–2008)
- research fellow at Institute of Theoretical Computer Science, Charles University, Prague (2003–2010)

Papers accepted to refereed international journals

1. Z. Dvorak, D. Kral: *On Planar Mixed Hypergraphs*, Electronic Journal on Combinatorics **8 (1)** (2001), #R35, 23 pages.
2. Z. Dvorak, D. Kral, R. Skrekovski: *Coloring Face Hypergraphs on Surfaces*, European Journal on Combinatorics **26(1)** (2004), 95-110.
3. Z. Dvorak, T. Kaiser, D. Kral: *Eulerian colorings and the Bipartizing matching conjecture of Fleischner*, European Journal of Combinatorics **27(7)** (2006), 1088-1101.
4. Z. Dvorak, D. Kral, O. Pangrac: *Locally consistent constraint satisfaction problems*, Theoretical Computer Science **348(2-3)** (2005), 187-206.
5. Z. Dvorak, R. Skrekovski: *A Theorem About a Contractible and Light Edge*, SIAM Journal on Discrete Mathematics **20(1)** (2006), 55-61.
6. Z. Dvorak, V. Jelinek, D. Kral, J. Kyncl, M. Saks: *Probabilistic Strategies for the Partition and Plurality Problems*, Random Structures & Algorithms **30(1-2)** (2007), 63 - 77.
7. Z. Dvorak, R. Skrekovski, T. Valla: *Four Gravity Results*, Discrete Mathematics **207(2)** (2007), 181-190.
8. J. Cerny, Z. Dvorak, V. Jelinek, J. Kara: *Noncrossing Hamiltonian Paths in Geometric Graphs*, Discrete Applied Mathematics **155(9)** (2007), 1096-1105.
9. Z. Dvorak, D. Kral, P. Nejedly, R. Skrekovski: *Coloring squares of planar graphs with girth six*, European Journal of Combinatorics **29(4)** (2007), 838-849.
10. Z. Dvorak, R. Skrekovski, M. Tancer: *List-Coloring Squares of Sparse Subcubic Graphs*, SIAM Journal on Discrete Mathematics **22(1)** (2008), 139-159.
11. Z. Dvorak, R. Skrekovski, T. Valla: *Planar graphs of odd-girth at least 9 are homomorphic to the Petersen graph*, SIAM Journal on Discrete Mathematics **22(2)** (2008), 568-591.
12. Z. Dvorak: *On Forbidden Subdivision Characterization of Graph Classes*, European Journal of Combinatorics **29(5)** (2008), 1321-1332.
13. Z. Dvorak, D. Kral, P. Nejedly, R. Skrekovski: *Distance constrained labelings of planar graphs with no short cycles*, Discrete Applied Mathematics **157** (2009), 2634-2645.
14. Z. Dvorak: *Two-factors in Oriented Graphs with Forbidden Transitions*, Discrete Mathematics **309(1)** (2009), 104-112.

15. Z. Dvorak, R. Skrekovski: *k*-chromatic number of graphs on surfaces, SIAM Journal on Discrete Mathematics **23(1)** (2009), 477-486.
16. Z. Dvorak, S. Jendrol, D. Kral, G. Pap: *Matchings and Non-rainbow Colorings*, SIAM Journal on Discrete Mathematics **23(1)** (2009), 344-348.
17. Z. Dvorak, B. Lidicky, R. Skrekovski: *Planar graphs without 3-, 7-, and 8-cycles are 3-choosable*, Discrete Mathematics **309(20)** (2009), 5899-5904.
18. Z. Dvorak, D. Kral, R. Skrekovski: *Non-Rainbow Colorings of 3-, 4- and 5-Connected Plane Graphs*, Journal of Graph Theory **63(2)** (2010), 129-145.
19. Z. Dvorak, D. Kral, J. Teska: *Toughness Threshold for the Existence of 2-walks in K_4 -minor Free Graphs*, Discrete Mathematics **310(3)** (2010), 642-651.
20. Z. Dvorak, T. Kaiser, D. Kral, J.-S. Sereni: *A Note on Antisymmetric Flows in Graphs*, European Journal of Combinatorics **31(1)** (2010), 320-324.
21. Z. Dvorak, S. Norine: *Small Graph Classes and Bounded Expansion*, Journal of Combinatorial Theory, series B **100** (2010), 171-175.
22. Z. Dvorak, K. Kawarabayashi, R. Thomas: *Three-coloring triangle-free planar graphs in linear time*, ACM Transactions on Algorithms **7** (2011), article no. 41.
23. Z. Dvorak: *On Recognizing Graphs by Numbers of Homomorphisms*, Journal of Graph Theory **64(4)** (2010), 330-342.
24. Z. Dvorak, B. Lidicky, R. Skrekovski: *3-choosability of triangle-free planar graphs with constraints on 4-cycles*, SIAM Journal on Discrete Mathematics **24** (2010), 934-945.
25. Z. Dvorak, B. Mohar: *Crossing-critical graphs with large maximum degree*, Journal of Combinatorial Theory, Series B **100(4)** (2010), 413-417.
26. H. Ardal, Z. Dvorak, V. Jungic, T. Kaiser: *On a Rado Type Problem for Homogeneous Second Order Linear Recurrences*, Electronic Journal of Combinatorics **17** (2010), #R38.
27. Z. Dvorak, B. Mohar: *Spectral radius of finite and infinite planar graphs and of graphs of bounded genus*, Journal of Combinatorial Theory, series B **100(6)** (2010), 729-739.
28. Z. Dvorak, B. Lidicky, R. Skrekovski: *Randić index and the diameter of a graph*, European Journal of Combinatorics **32** (2011), 434-442.
29. Z. Dvorak, A. C. Giannopoulou, D. M. Thilikos: *Forbidden Graphs for Tree-depth*, European Journal of Combinatorics **33** (2012), 969-979.

30. Z. Dvorak, B. Lidicky, R. Skrekovski: *Graphs with two crossings are 5-choosable*, SIAM Journal on Discrete Mathematics **25** (2011), 1746-1753.
31. Z. Dvorak, D. Kral: *Classes of graphs with small rank decompositions are χ -bounded*, European Journal of Combinatorics **33** (2012), 679-683.
32. Z. Dvorak, B. Mohar, R. Samal: *Star chromatic index*, Journal of Graph Theory **72** (2013), 313-326.
33. Z. Dvorak, B. Mohar: *Chromatic number and complete graph substructures for degree sequences*, Combinatorica **33** (2013), 513-529.
34. Z. Dvorak, B. Lidicky, R. Skrekovski: *Bipartizing fullerenes*, European Journal of Combinatorics **33** (2012), 1286-1293.
35. Z. Dvorak, B. Mohar: *Spectrally degenerate graphs: Hereditary case*, Journal of Combinatorial Theory, series B **102** (2012), 1099-1109.
36. Z. Dvorak, D. Kral, R. Thomas: *Three-coloring triangle-free graphs on surfaces I. Extending a coloring to a disk with one triangle*, accepted to Journal of Combinatorial Theory, series B.
37. Z. Dvorak: *Constant-factor approximation of domination number in sparse graphs*, European Journal of Combinatorics **34** (2013), 833-840.
38. Z. Dvorak, L. Esperet: *Distance-two coloring of sparse graphs*, European Journal of Combinatorics **36** (2014), 406-415.
39. A. Asadi, Z. Dvorak, L. Postle, R. Thomas: *Sub-exponentially many 3-colorings of triangle-free planar graphs*, Journal of Combinatorial Theory, series B **103** (2013), 706-712.
40. Z. Dvorak, D. Kral, R. Thomas: *Testing first-order properties for subclasses of sparse graphs*, Journal of the ACM **60** (2013), article 36.
41. Z. Dvorak: *3-choosability of planar graphs with (≤ 4) -cycles far apart*, Journal of Combinatorial Theory, series B **104** (2014), 28-59.
42. Z. Dvorak, T. Klimosova: *Strong immersions and maximum degree*, SIAM Journal on Discrete Mathematics **28** (2014), 177-187.
43. Z. Dvorak, J.-S. Sereni, J. Volec: *Subcubic triangle-free graphs have fractional chromatic number at most $14/5$* , Journal of the London Mathematical Society **89** (2014), 641-662.
44. Z. Dvorak, B. Lidicky: *4-critical graphs on surfaces without contractible (≤ 4) -cycles*, SIAM Journal on Discrete Mathematics **28** (2014), 521-552.
45. O. Borodin, Z. Dvorak, A. Kostochka, B. Lidicky, M. Yancey: *Planar 4-critical graphs with four triangles*, European Journal of Combinatorics **41** (2014), 138-151.

46. M. DeVoss, Z. Dvorak, J. Fox, J. McDonald, B. Mohar, D. Scheide: *Minimum degree condition forcing complete graph immersion*, *Combinatorica* **34** (2014), 279-298.
47. Z. Dvorak, B. Lidicky: *3-coloring triangle-free planar graphs with a pre-colored 8-cycle*, accepted to *Journal of Graph Theory*.
48. Z. Dvorak, J.-S. Sereni, Jan Volec: *Fractional coloring of triangle-free planar graphs*, accepted to *Electronic Journal of Combinatorics*.

Papers presented at international conferences

1. Z. Dvorak, J. Kara, D. Kral, O. Pangrac: *On Pattern Coloring of Cycle Systems*, Proceedings 28th International Workshop on Graph-Theoretic Concepts (WG'02), Lecture Notes in Computer Science vol. 2573, p. 164-175, Springer-Verlag, 2002.
2. Z. Dvorak: *New Loop Optimizer for GCC*, First Annual GCC Developers' Summit, 2003.
3. J. Cerny, Z. Dvorak, V. Jelinek, J. Kara: *Noncrossing Hamiltonian Paths in Geometric Graphs*, Proceedings 11th International Symposium on Graph Drawing, Lecture Notes in Computer Science vol. 2912, Springer-Verlag, 2004.
4. Z. Dvorak, J. Kara, D. Kral, O. Pangrac: *An Algorithm for Cyclic Edge Connectivity of Cubic Graphs*, Proceedings 9th Scandinavian Workshop on Algorithm Theory (SWAT'04), Lecture Notes in Computer Science vol. 3111, p. 236-247, Springer-Verlag, 2004.
5. Z. Dvorak, D. Kral, O. Pangrac: *Locally consistent constraint satisfaction problems*, Proceedings 31st International Colloquium Automata, Languages and Programming (ICALP'04), Lecture Notes in Computer Science vol. 3142, p. 469-480, Springer-Verlag, 2004.
6. Z. Dvorak: *Declarative world inspiration*, Second Annual GCC Developers' Summit, 2004.
7. Z. Dvorak, V. Jelinek, D. Kral, J. Kyncl, M. Saks: *Three optimal algorithms for balls of three colors*, Proceedings of 22nd Annual Symposium on Theoretical Aspects of Computer Science (STACS'05), Lecture Notes in Computer Science vol. 3404, p. 206-217, Springer-Verlag, 2005.
8. Z. Dvorak, V. Jelinek: *On the Complexity of the G-Reconstruction Problem*, Proceedings of Algorithms and Computation: 16th International Symposium, ISAAC 2005, Lecture Notes in Computer Science vol. 3827, p. 196 - 205, Springer-Verlag, 2006.

9. Z. Dvorak, D. Kral, R. Thomas: *Coloring triangle-free graphs on surfaces*, SODA 2009, Proceedings of the twentieth Annual ACM-SIAM Symposium on Discrete Algorithms.
10. Z. Dvorak, B. Mohar: *Spectral radius of finite and infinite planar graphs and of graphs of bounded genus (extended abstract)*, European Conference on Combinatorics, Graph Theory and Applications (EuroComb 2009), Electronic Notes in Discrete Mathematics **34** (2009), 101-105.
11. Z. Dvorak, D. Kral: *Algorithms for classes of graphs with bounded expansion*, in Graph-Theoretic Concepts in Computer Science, Christophe Paul and Michel Habib (Eds.). Lecture Notes In Computer Science, Vol. 5911., Springer-Verlag, 2009.
12. Z. Dvorak, D. Kral, R. Thomas: *Deciding first-order properties for sparse graphs (Extended abstract)*, in Proceedings of FOCS'2010, 133-142.
13. Z. Dvorak, K. Kawarabayashi: *List-coloring embedded graphs*, in Proceedings of the Annual ACM-SIAM Symposium on Discrete Algorithms (2013), 1004-1012.
14. Z. Dvorak, V. Tuma: *A dynamic data structure for counting subgraphs in sparse graphs*, in Proceedings of 13th International Symposium, WADS 2013, Lecture Notes in Computer Science Volume 8037, 2013, 304-315.
15. Z. Dvorak, M. Mních: *Large Independent Sets in Triangle-Free Planar Graphs*, Algorithms – ESA 2014, Lecture Notes in Computer Science Volume 8737, 2014, 346-357.
16. Z. Dvorak, M. Kupec, V. Tuma: *A dynamic data structure for MSO properties in graphs with bounded tree-depth*, Algorithms – ESA 2014, Lecture Notes in Computer Science Volume 8737, 2014, 334-345.

Invited plenary talks

- Czech-Slovak Graph Theory Conference, Teplice nad Bečvou, Czech Republic, 2014.
- Cycles and Colorings, Nový Smokovec, Slovakia, 2014.

Submitted papers

1. Z. Dvorak, J. Kara, D. Kral, O. Pangrac: *Feasible Sets of Pattern Hypergraphs*, available as ITI report 2002-093.
2. J. Cerný, Z. Dvorak, V. Jelinek, and P. Podbrdský: *Generalization of the polygon-crossing problem*, available as KAM-DIMATIA report 2003-623.
3. Z. Dvorak: *Eulerian tours in graphs with forbidden transitions and bounded degree*, available as KAM-DIMATIA report 2004-669.

4. Z. Dvorak, K. Kawarabayashi, D. Kral: *Packing six T-joins in plane graphs*, submitted.
5. Z. Dvorak, B. Lidicky, B. Mohar: *5-choosability of graphs with crossings far apart*, submitted.
6. Z. Dvorak: *A stronger structure theorem for excluded topological minors*, submitted.
7. Z. Dvorak, B. Lidicky, B. Mohar, L. Postle: *5-list-coloring planar graphs with distant precolored vertices*, submitted.
8. M. Chudnovsky, Z. Dvorak, T. Klimosova, P. Seymour: *Immersion in four-edge-connected graphs*, submitted.
9. Z. Dvorak, R. Thomas: *List-coloring apex-minor-free graphs*, submitted.
10. Z. Dvorak, D. Kral, R. Thomas: *Three-coloring triangle-free graphs on surfaces II. 4-critical graphs in a disk*, submitted.
11. Z. Dvorak, D. Kral, R. Thomas: *Three-coloring triangle-free graphs on surfaces III. Graphs of girth five*, submitted.
12. Z. Dvorak, D. Kral, R. Thomas: *Three-coloring triangle-free graphs on surfaces IV. Bounding face sizes of 4-critical graphs*, submitted.
13. Z. Dvorak: *Sublinear separators, fragility and subexponential expansion*, submitted.
14. Z. Dvorak, B. Mohar: *Crossing number of periodic graphs*, submitted.
15. Z. Dvorak, P. Wollan: *A structure theorem for strong immersions*, submitted.
16. Z. Dvorak, L. Postle: *Density of 5/2-critical graphs*, submitted.

Popularization papers

- Z. Dvorak, M. Mares, P. Skoda: *Recepty z programatorske kucharky Korespondencniho seminare z programovani – VII. dil*, *Rozhledy matematicko-fyzikalni* **83(1)** (2008), 24-30.
- Z. Dvorak, M. Mares, D. Matousek: *Recepty z programatorske kucharky Korespondencniho seminare z programovani – VIII. dil*, *Rozhledy matematicko-fyzikalni* **83(4)** (2008), 16-26.

Other activities

- Organized a minisymposium on graph colorings at SIAM Conference on Discrete Mathematics 2014.
- Track chair at MEMICS 2014.
- Associate editor of Electronic Journal of Combinatorics (since 2014).
- Associate editor of Discrete Mathematics (since 2013).
- Organizer of local conference STTT'13 (Contemporary trends in computer science).
- Helping with organization of the national olympiad in informatics (since 1999).
- Helping with organization of the correspondence seminar in programming, in years 1999–2006.
- Prepared tasks for the ACM competition (Czech Technical University Open) in years 2004–2006.
- Contributing to the GCC (GNU Compiler Collection) project in years 2002–2008.

Awards and competitions

- The prize of the Czech Union of Mathematicians for young mathematicians in 2014.
- The Neuron prize for young mathematicians given by Karel Janecek foundation in 2011.
- The Josef Hlavka award 2004.
- The best student paper award at 9th Scandinavian Workshop on Algorithm Theory (SWAT'04).
- The 14th place at the World Finals of the ACM International Collegiate Programming Contest 2001.
- Gold medal (with the 10th score) at the 11th International Olympiad in Informatics (1999).
- Participated at the 40th International Mathematics Olympiad (1999).