

# CURRICULUM VITAE

Matúš Mihalák  
Maastricht University  
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Born Sept. 25, 1978, in Prešov, (Czecho)Slovakia; single, 2 children

## Education

- 10/2002 – 10/2006 Ph. D. (Thesis "Optimization Problems in Communication Networks), advisor: T. Erlebach, co-referees L. Gaszieniec, Liverpool, UK, R. Raman, Leicester, UK; Department of Computer Science, University of Leicester, UK;
- 09/1997 – 06/2002 Magister (equivalent to Master) in Theoretical Computer Science and Computer Graphics, Department of Computer Science, Comenius University, Bratislava, Slovakia

## Employment

- 03/2015 – present Assistant Professor; Department of Knowledge Engineering, Maastricht University, The Netherlands;
- 01/2011 – 02/2015 Senior researcher (Oberassistent); Institute of Theoretical Computer Science, ETH Zurich, Switzerland;
- 10/2006 – 12/2010 Postdoctoral fellow; Institute of Theoretical Computer Science, ETH Zurich, Switzerland;
- 10/2004 – 09/2006 Research assistant; Dept. of Computer Science, University of Leicester, UK;
- 04/2003 – 09/2004 Research assistant; The Computer Engineering and Networks Laboratory, ETH Zurich, Switzerland;

## Services to the Community

### Program Committee Member

Programm committee member of ATMOS 2010, COCOA 2013, FUN 2014, CIAC 2015, and ATMOS 2015

### Program Committee and Conference (Co-) Chair

Programm committee co-chair of ATMOS 2014

## Invited Talks

- 2014 Invited to give a talk at the WALCOM 2014 pre-workshop school on algorithms and combinatorics
- 2014 Invited to give a contributed talk at the stream "Algorithmic Game Theory" of OR 2014 (International Conference on Operations Research)
- 2015 Invited to give a talk at the 2nd German Day on Computation Game Theory at TU Berlin

## Referee

**Scientific Referee for Conferences:** AAIM, ALENEX, ATMOS, CIAC, COCOA, ESA, FSTTCS, FUN, ICALP, ICDT, MFCS, PODS, SAGT, SIROCCO, SODA, SPAA, SWAT, TAPAS, WALCOM, WG, WINE

**Scientific Referee for Journals:** ALGORITHMICA, DAM, Distributed Computing, JCSS, IJCM, IEEE Transactions on Mobile Computing, OR Letters, OR Spectrum, TALG, TCS, TOCS, Transactions on Computers

## Co-advisor and Co-referee of Doctoral Theses

Co-advisor and Co-referee of the doctoral thesis of Jens Maue (2011), Holger Flier (2011), Yann Disser (2011), Sandro Montanari (2015)

Co-advisor of the thesis of Rastislav Šrámek (2013)

## Teaching

2015	Graph Theory (Maastricht University, The Netherlands)
2015	Planning and Scheduling (Maastricht University, The Netherlands)
2007 – 2014	Algorithmic Game Theory (ETH Zurich, Switzerland)
2011	Theoretical Computer Science (University of Basel, Switzerland)
2011 – 2014	Seminar on Algorithmic Game Theory
2011	Seminar on Approximation Algorithms

## Involvement in Research Projects

Past Involvement (as Researcher): EU project eCompass (2011 – present), EU Project ARRIVAL (2006 – 2009), EU Project DELIS (2004 – 2008), SNSF Project "Robust Optimization"

Grant (Co-)Owner: Network Creation/Design Games (05/2013 – 04/2016), funded by SNSF; Algorithm Design for Microrobots with Energy Constraints (2015 – 2018), funded by SNSF/ANR (French/Swiss Project with the University of Marseille)

# List of Publications of Matúš Mihalák

## Refereed Journals

- [1] J. Chalopin, S. Das, Y. Disser, M. Mihalák, and P. Widmayer. “Mapping Simple Polygons: The Power of Telling Convex from Reflex”. In: *ACM Transactions on Algorithms* 11.4 (2015), p. 33. DOI: [10.1145/2700223](https://doi.org/10.1145/2700223).
- [2] Y. Disser, A. E. Feldmann, M. Klimm, and M. Mihalák. “Improving the  $H_k$ -bound on the price of stability in undirected Shapley network design games”. In: *Theor. Comput. Sci.* 562 (2015), pp. 557–564. DOI: [10.1016/j.tcs.2014.10.037](https://doi.org/10.1016/j.tcs.2014.10.037).
- [3] H. Flier, M. Mihalák, P. Widmayer, A. Zych, Y. Kobayashi, and A. Schöbel. “Selecting vertex disjoint paths in plane graphs”. In: *Networks* 66.2 (2015), pp. 136–144. DOI: [10.1002/net.21618](https://doi.org/10.1002/net.21618).
- [4] A. Mamageishvili, M. Mihalák, and D. Müller. “Tree Nash Equilibria in the Network Creation Game”. In: *Internet Mathematics* 11.4-5 (2015), pp. 472–486. DOI: [10.1080/15427951.2015.1016248](https://doi.org/10.1080/15427951.2015.1016248).
- [5] Y. Disser, S. K. Ghosh, M. Mihalák, and P. Widmayer. “Mapping a polygon with holes using a compass”. In: *Theor. Comput. Sci.* 553 (2014), pp. 106–113. DOI: [10.1016/j.tcs.2013.12.010](https://doi.org/10.1016/j.tcs.2013.12.010).
- [6] J. Chalopin, S. Das, Y. Disser, M. Mihalák, and P. Widmayer. “Mapping Simple Polygons: How Robots Benefit from Looking Back”. In: *Algorithmica* 65.1 (2013), pp. 43–59. DOI: [10.1007/s00453-011-9572-8](https://doi.org/10.1007/s00453-011-9572-8).
- [7] J. Chalopin, S. Das, Y. Disser, M. Mihalák, and P. Widmayer. “Simple agents learn to find their way: An introduction on mapping polygons”. In: *Discrete Applied Mathematics* 161.10–11 (2013), pp. 1287–1307. DOI: [10.1016/j.dam.2013.01.006](https://doi.org/10.1016/j.dam.2013.01.006).
- [8] M. Mihalák and J. C. Schlegel. “The Price of Anarchy in Network Creation Games Is (Mostly) Constant”. In: *Theory Comput. Syst.* 53.1 (2013), pp. 53–72. DOI: [10.1007/s00224-013-9459-y](https://doi.org/10.1007/s00224-013-9459-y).
- [9] D. Bilò, Y. Disser, M. Mihalák, S. Suri, E. Vicari, and P. Widmayer. “Reconstructing visibility graphs with simple robots”. In: *Theor. Comput. Sci.* 444 (2012), pp. 52–59. DOI: [10.1016/j.tcs.2012.01.008](https://doi.org/10.1016/j.tcs.2012.01.008).
- [10] Y. Disser, M. Mihalák, and P. Widmayer. “A polygon is determined by its angles”. In: *Comput. Geom.* 44.8 (2011), pp. 418–426.
- [11] F. V. Fomin, P. A. Golovach, A. Hall, M. Mihalák, E. Vicari, and P. Widmayer. “How to Guard a Graph?” In: *Algorithmica* 61.4 (2011), pp. 839–856. DOI: [10.1007/s00453-009-9382-4](https://doi.org/10.1007/s00453-009-9382-4).
- [12] D. Bilò, T. Erlebach, M. Mihalák, and P. Widmayer. “Discovery of network properties with all-shortest-paths queries”. In: *Theor. Comput. Sci.* 411.14-15 (2010), pp. 1626–1637. DOI: [10.1016/j.tcs.2010.01.010](https://doi.org/10.1016/j.tcs.2010.01.010).
- [13] T. Erlebach, R. Jacob, M. Mihalák, M. Nunkesser, G. Szabó, and P. Widmayer. “An Algorithmic View on OVSF Code Assignment”. In: *Algorithmica* 47.3 (2007), pp. 269–298. DOI: [10.1007/s00453-006-0188-3](https://doi.org/10.1007/s00453-006-0188-3).
- [14] Z. Beerliová, F. Eberhard, T. Erlebach, A. Hall, M. Hoffmann, M. Mihalák, and L. Ram. “Network Discovery and Verification”. In: *IEEE Journal on Selected Areas in Communications (JSAC)* 24.12 (2006), pp. 2168–2181.

## Refereed Conference Papers

- [15] B. Geissmann, M. Mihalák, and P. Widmayer. “Recurring Comparison Faults: Sorting and Finding the Minimum”. In: *Proc. of the 20th International Symposium on Fundamentals of Computation Theory (FCT)*. 2015, pp. 227–239. DOI: [10.1007/978-3-319-22177-9\\_18](https://doi.org/10.1007/978-3-319-22177-9_18).
- [16] A. Bärtschi, S. K. Ghosh, M. Mihalák, T. Tschager, and P. Widmayer. “Improved bounds for the conflict-free chromatic art gallery problem”. In: *Proc. 30th Annual Symposium on Computational Geometry (SOCG)*. 2014, p. 144. DOI: [10.1145/2582112.2582117](https://doi.org/10.1145/2582112.2582117).
- [17] J. Chalopin, R. Jacob, M. Mihalák, and P. Widmayer. “Data Delivery by Energy-Constrained Mobile Agents on a Line”. In: *Proc. ICALP (2)*. 2014, pp. 423–434.
- [18] Y. Disser, M. Mihalák, S. Montanari, and P. Widmayer. “Rectilinear Shortest Path and Rectilinear Minimum Spanning Tree with Neighborhoods”. In: *Proc. Third International Symposium on Combinatorial Optimization (ISCO)*. 2014, pp. 208–220. DOI: [10.1007/978-3-319-09174-7\\_18](https://doi.org/10.1007/978-3-319-09174-7_18).
- [19] A. Mamageishvili, M. Mihalák, and S. Montemazzani. “An  $H_{n/2}$  Upper Bound on the Price of Stability of Undirected Network Design Games”. In: *Proc. 39th International Symposium on Mathematical Foundations of Computer Science (MFCS)*. 2014, pp. 541–552. DOI: [10.1007/978-3-662-44465-8\\_46](https://doi.org/10.1007/978-3-662-44465-8_46).

- [20] D. Bilò, Y. Disser, L. Gualà, M. Mihalák, G. Proietti, and P. Widmayer. “Polygon-Constrained Motion Planning Problems”. In: *Proceedings of the 9th International Symposium on Algorithms and Experiments for Sensor Systems, Wireless Networks and Distributed Robotics (ALGOSENSORS)*. 2013, pp. 67–82. DOI: [10.1007/978-3-642-45346-5\\_6](https://doi.org/10.1007/978-3-642-45346-5_6).
- [21] K. Böhmová, M. Mihalák, T. Pröger, R. Šrámek, and P. Widmayer. “Robust Routing in Urban Public Transportation: How to Find Reliable Journeys Based on Past Observations”. In: *Proceedings of the 13th Workshop on Algorithmic Approaches for Transportation Modelling, Optimization, and Systems (ATMOS)*. 2013, pp. 27–41. DOI: [10.4230/OASICS.ATMOS.2013.27](https://doi.org/10.4230/OASICS.ATMOS.2013.27).
- [22] K. Böhmová, Y. Disser, M. Mihalák, and P. Widmayer. “Interval Selection with Machine-Dependent Intervals”. In: *Proc. 13th International Symposium on Algorithms and Data Structures (WADS)*. 2013, pp. 170–181. DOI: [10.1007/978-3-642-40104-6\\_15](https://doi.org/10.1007/978-3-642-40104-6_15).
- [23] J. M. Buhmann, M. Mihalák, R. Šrámek, and P. Widmayer. “Robust optimization in the presence of uncertainty”. In: *Proc. Innovations in Theoretical Computer Science (ITCS)*. 2013, pp. 505–514. DOI: [10.1145/2422436.2422491](https://doi.org/10.1145/2422436.2422491).
- [24] J. Chalopin, S. Das, M. Mihalák, P. Penna, and P. Widmayer. “Data Delivery by Energy-Constrained Mobile Agents”. In: *Proceedings of the 9th International Symposium on Algorithms and Experiments for Sensor Systems, Wireless Networks and Distributed Robotics (ALGOSENSORS)*. 2013, pp. 111–122. DOI: [10.1007/978-3-642-45346-5\\_9](https://doi.org/10.1007/978-3-642-45346-5_9).
- [25] Y. Disser, A. E. Feldmann, M. Klimm, and M. Mihalák. “Improving the  $H_k$ -Bound on the Price of Stability in Undirected Shapley Network Design Games”. In: *Proc. Algorithms and Complexity, 8th International Conference (CIAC)*. 2013, pp. 158–169. DOI: [10.1007/978-3-642-38233-8\\_14](https://doi.org/10.1007/978-3-642-38233-8_14).
- [26] A. Mamageishvili, M. Mihalák, and D. Müller. “Tree Nash Equilibria in the Network Creation Game”. In: *Proceedings of the 10th International Workshop on Algorithms and Models for the Web Graph (WAW)*. 2013, pp. 118–129. DOI: [10.1007/978-3-319-03536-9\\_10](https://doi.org/10.1007/978-3-319-03536-9_10).
- [27] M. Mihalák, R. Šrámek, and P. Widmayer. “Counting Approximately-Shortest Paths in Directed Acyclic Graphs”. In: *Proc. 11th International Workshop on Approximation and Online Algorithms (WAOA)*. 2013, pp. 156–167. DOI: [10.1007/978-3-319-08001-7\\_14](https://doi.org/10.1007/978-3-319-08001-7_14).
- [28] Y. Disser, M. Mihalák, and P. Widmayer. “Mapping polygons with agents that measure angles”. In: *Proceedings of the Tenth International Workshop on the Algorithmic Foundations of Robotics (WAFR)*. (to appear). 2012.
- [29] Y. Disser, M. Mihalák, S. K. Ghosh, and P. Widmayer. “Mapping a polygon with holes using a compass”. In: *Proceedings of the 8th International Symposium on Algorithms for Sensor Systems, Wireless Ad Hoc Networks and Autonomous Mobile Entities (Algosensors)*. 2012, pp. 78–89. DOI: [10.1007/978-3-642-36092-3\\_9](https://doi.org/10.1007/978-3-642-36092-3_9).
- [30] M. Mihalák and J. C. Schlegel. “Asymmetric Swap-Equilibrium: A Unifying Equilibrium Concept for Network Creation Games”. In: *Proceedings of the 37th International Symposium on Mathematical Foundations of Computer Science (MFCS)*. 2012, pp. 693–704. DOI: [10.1007/978-3-642-32589-2\\_60](https://doi.org/10.1007/978-3-642-32589-2_60).
- [31] M. Bohlin, H. Flier, J. Maue, and M. Mihalák. “Track Allocation in Freight-Train Classification with Mixed Tracks”. In: *11th Workshop on Algorithmic Approaches for Transportation Modelling, Optimization, and Systems (ATMOS)*. Ed. by A. Caprara and S. Kontogiannis. Vol. 20. OpenAccess Series in Informatics (OASICS). Dagstuhl, Germany: Schloss Dagstuhl–Leibniz-Zentrum fuer Informatik, 2011, pp. 38–51. ISBN: 978-3-939897-33-0. DOI: [10.4230/OASICS.ATMOS.2011.38](https://doi.org/10.4230/OASICS.ATMOS.2011.38).
- [32] J. Chalopin, S. Das, Y. Disser, M. Mihalák, and P. Widmayer. “Telling convex from reflex allows to map a polygon”. In: *Proceedings of the 28th International Symposium on Theoretical Aspects of Computer Science (STACS)*. 2011, pp. 153–164. DOI: [10.4230/LIPIcs.STACS.2011.153](https://doi.org/10.4230/LIPIcs.STACS.2011.153).
- [33] H. Flier, M. Mihalák, P. Widmayer, and A. Zych. “Maximum Independent Set in 2-Direction Outersegment Graphs”. In: *Proceedings of the 37th International Workshop on Graph-Theoretic Concepts in Computer Science (WG)*. 2011, pp. 155–166. ISBN: 978-3-642-25869-5. DOI: [10.1007/978-3-642-25870-1\\_15](https://doi.org/10.1007/978-3-642-25870-1_15).
- [34] M. Mihalák, M. Schöngens, R. Šrámek, and P. Widmayer. “On the Complexity of the Metric TSP under Stability Considerations”. In: *Proceedings of the 37th Conference on Current Trends in Theory and Practice of Computer Science (SOFSEM)*. 2011, pp. 382–393. DOI: [10.1007/978-3-642-18381-2\\_32](https://doi.org/10.1007/978-3-642-18381-2_32).
- [35] J. Chalopin, S. Das, Y. Disser, M. Mihalák, and P. Widmayer. “How Simple Robots Benefit from Looking Back”. In: *Proceedings of the 7th International Conference on Algorithms and Complexity (CIAC)*. 2010, pp. 229–239. DOI: [10.1007/978-3-642-13073-1\\_21](https://doi.org/10.1007/978-3-642-13073-1_21).
- [36] Y. Disser, M. Mihalák, and P. Widmayer. “Reconstructing a Simple Polygon from Its Angles”. In: *Proceedings of the 12th Scandinavian Symposium and Workshops on Algorithm Theory (SWAT)*. 2010, pp. 13–24. DOI: [10.1007/978-3-642-13731-0\\_2](https://doi.org/10.1007/978-3-642-13731-0_2).

- [37] H. Flier, M. Mihalák, A. Schöbel, P. Widmayer, and A. Zych. “Vertex Disjoint Paths for Dispatching in Railways”. In: *Proceedings of the 10th Workshop on Algorithmic Approaches for Transportation Modelling, Optimization, and Systems (ATMOS)*. 2010, pp. 61–73. ISBN: 978-3-939897-20-0. DOI: [10.4230/OASICS.ATMOS.2010.61](https://doi.org/10.4230/OASICS.ATMOS.2010.61).
- [38] M. Mihalák and J. C. Schlegel. “The Price of Anarchy in Network Creation Games Is (Mostly) Constant”. In: *Proceedings of the Third International Symposium on Algorithmic Game Theory (SAGT)*. 2010, pp. 276–287. DOI: [10.1007/978-3-642-16170-4](https://doi.org/10.1007/978-3-642-16170-4).
- [39] D. Bilò, Y. Disser, M. Mihalák, S. Suri, E. Vicari, and P. Widmayer. “Reconstructing Visibility Graphs with Simple Robots”. In: *Proceedings of the 16th International Colloquium on Structural Information and Communication Complexity (SIROCCO)*. 2009, pp. 87–99. DOI: [10.1007/978-3-642-11476-2\\_8](https://doi.org/10.1007/978-3-642-11476-2_8).
- [40] Y. Disser, D. Bilò, M. Mihalák, S. Suri, E. Vicari, and P. Widmayer. “On the Limitations of Combinatorial Visibilities”. In: *Proceedings of the 25th European Workshop on Computational Geometry (EuroCG)*. 2009. URL: <http://2009.eurocg.org/abstracts.pdf>.
- [41] T. Erlebach and M. Mihalák. “A  $(4 + \varepsilon)$ -Approximation for the Minimum-Weight Dominating Set Problem in Unit Disk Graphs”. In: *Proceedings of the 7th International Workshop on Approximation and Online Algorithms (WAOA)*. 2009, pp. 135–146. DOI: [10.1007/978-3-642-12450-1\\_13](https://doi.org/10.1007/978-3-642-12450-1_13).
- [42] A. Komuravelli and M. Mihalák. “Exploring Polygonal Environments by Simple Robots with Faulty Combinatorial Vision”. In: *Proceedings of the 11th International Symposium on Stabilization, Safety, and Security of Distributed Systems (SSS)*. 2009, pp. 458–471. DOI: [10.1007/978-3-642-05118-0\\_32](https://doi.org/10.1007/978-3-642-05118-0_32).
- [43] D. Bilò, T. Erlebach, M. Mihalák, and P. Widmayer. “Discovery of Network Properties with All-Shortest-Paths Queries”. In: *Proceedings of the 15th International Colloquium on Structural Information and Communication Complexity (SIROCCO)*. 2008, pp. 89–103. DOI: [10.1007/978-3-540-69355-0\\_9](https://doi.org/10.1007/978-3-540-69355-0_9).
- [44] J. Brunner, M. Mihalák, S. Suri, E. Vicari, and P. Widmayer. “Simple Robots in Polygonal Environments: A Hierarchy”. In: *Proceedings of the 4th International Workshop on Algorithmic Aspects of Wireless Sensor Networks (ALGOSENSORS)*. 2008, pp. 111–124. DOI: [10.1007/978-3-540-92862-1\\_10](https://doi.org/10.1007/978-3-540-92862-1_10).
- [45] S. Das, M. Mihalák, R. Šrámek, E. Vicari, and P. Widmayer. “Rendezvous of Mobile Agents When Tokens Fail Anytime”. In: *Proceedings of the 12th International Conference on Principles of Distributed Systems (OPODIS)*. 2008, pp. 463–480. DOI: [http://dx.doi.org/10.1007/978-3-540-92221-6\\_29](http://dx.doi.org/10.1007/978-3-540-92221-6_29).
- [46] F. V. Fomin, P. A. Golovach, A. Hall, M. Mihalák, E. Vicari, and P. Widmayer. “How to Guard a Graph?” In: *Proceedings of the 19th International Symposium on Algorithms and Computation (ISAAC)*. 2008, pp. 318–329. DOI: [http://dx.doi.org/10.1007/978-3-540-92182-0\\_30](http://dx.doi.org/10.1007/978-3-540-92182-0_30).
- [47] B. Gfeller, M. Mihalák, S. Suri, E. Vicari, and P. Widmayer. “Angle Optimization in Target Tracking”. In: *Proceedings of the 11th Scandinavian Workshop on Algorithm Theory (SWAT)*. 2008, pp. 65–76. DOI: [10.1007/978-3-540-69903-3](https://doi.org/10.1007/978-3-540-69903-3).
- [48] M. Hoffmann, T. Erlebach, D. Krizanc, M. Mihalák, and R. Raman. “Computing Minimum Spanning Trees with Uncertainty”. In: *Proceedings of the 25th Annual Symposium on Theoretical Aspects of Computer Science (STACS)*. 2008, pp. 277–288. URL: <http://arxiv.org/abs/0802.2855>.
- [49] T. Erlebach, A. Hall, and M. Mihalák. “Approximate Discovery of Random Graphs”. In: *Proceedings of the 4th Symposium on Stochastic Algorithms, Foundations, and Applications (SAGA)*. 2007, pp. 82–92.
- [50] B. Gfeller, M. Mihalák, S. Suri, E. Vicari, and P. Widmayer. “Counting Targets with Mobile Sensors in an Unknown Environment”. In: *Proceedings of the Third International Workshop on Algorithmic Aspects of Wireless Sensor Networks (ALGOSENSORS)*. 2007, pp. 32–45. ISBN: 978-3-540-77870-7.
- [51] C. Ambühl, T. Erlebach, M. Mihalák, and M. Nunkesser. “Constant-Factor Approximation for Minimum-Weight (Connected) Dominating Sets in Unit Disk Graphs”. In: *Proceedings of the 9th International Workshop on Approximation Algorithms for Combinatorial Optimization Problems (APPROX)*. 2006, pp. 3–14. DOI: [10.1007/11830924\\_3](https://doi.org/10.1007/11830924_3).
- [52] T. Erlebach, A. Hall, M. Hoffmann, and M. Mihalák. “Network Discovery and Verification with Distance Queries”. In: *Proceedings of the 6th International Conference on Algorithms and Complexity (CIAC)*. 2006.
- [53] T. Erlebach, R. Jacob, M. Mihalák, M. Nunkesser, G. Szabó, and P. Widmayer. “Joint Base Station Scheduling”. In: *Proceedings of the 2nd International Workshop on Approximation and Online Algorithms (WAOA)*. 2004.

## Books and Contributions in Books

- [54] M. Gatto, J. Maue, M. Mihalák, and P. Widmayer. “Shunting for Dummies: An Introductory Algorithmic Survey”. In: *Robust and Online Large-Scale Optimization*. Ed. by R. K. Ahuja, R. H. Möhring, and C. D. Zaroliagis. Vol. 5868. Lecture Notes in Computer Science. Springer, 2009, pp. 310–337. DOI: [10.1007/978-3-642-05465-5\\_13](https://doi.org/10.1007/978-3-642-05465-5_13).

## Technical Reports and other Publications

- [55] M. Mihalák. “Optimization Problems in Communication Networks”. PhD thesis. Department of Computer Science, University of Leicester, 2006.