

Irina Kostitsyna

Assistant Professor

Department of Mathematics and Computer Science
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EDUCATION

- Ph.D.** Computer Science Department, Stony Brook University, USA 2013
Thesis: *Balanced Partitioning of Polygonal Domains*
- M.S.** Department of Control and Applied Mathematics, Moscow Institute of Physics and Technology / Institute for System Programming (RAS), Russia 2007
Thesis: *Formal Verification Methods of Mobile IPv6 Correspondent Node Application*
- B.S.** Department of Control and Applied Mathematics, Moscow Institute of Physics and Technology / Institute for System Programming (RAS), Russia 2005
Thesis: *Testing a Correspondent Node Implementation for Conformance to Mobile IPv6 Specification*

RESEARCH EXPERIENCE

- Assistant Professor** Department of Mathematics and Computer Science, Technische Universiteit Eindhoven, Eindhoven, the Netherlands 2017—present
- Postdoctoral Fellow** Computer Science Department, Université libre de Bruxelles (ULB), Brussels, Belgium 2016—2017
- Postdoctoral Fellow** Department of Mathematics and Computer Science, Technische Universiteit Eindhoven, Eindhoven, the Netherlands 2013—2016
- Research Assistant** Computer Science Department, Stony Brook University, Stony Brook, USA 2008—2013

PUBLICATIONS

Journal Publications and Conference Proceedings

- [1] P. Bose, I. Kostitsyna, S. Langerman. “Self-approaching paths in simple polygons,” 33rd International Symposium on Computational Geometry (SoCG), 2017
- [2] I. Kostitsyna, M. Löffler, V. Polishchuk, F. Staals. “On the complexity of minimum-link path problems,” in Special issue of Journal of Computational Geometry of Selected Papers from SoCG'16, vol. 8(2), 2017

- [3] N. Bonichon, P. Bose, P. Carmi, I. Kostitsyna, A. Lubiw, S. Verdonschot, "Gabriel Triangulations and Angle-Monotone Graphs: Local Routing and Recognition," in 24th International Symposium on Graph Drawing & Network Visualization (GD), 2016
- [4] E. Chambers, I. Kostitsyna, M. Löffler, F. Staals, "Homotopy Measures for Representative Trajectories," in 24th European Symposium on Algorithms (ESA), 2016
- [5] Q. Bouts, I. Kostitsyna, M. van Kreveld, W. Meulemans, W. Sonke, K. Verbeek, "Mapping polygons to the grid with small Hausdorff and Fréchet distance," in 24th European Symposium on Algorithms (ESA), 2016
- [6] I. Kostitsyna, M. Löffler, V. Polishchuk, F. Staals, "On the complexity of minimum-link path problems," in 32nd International Symposium on Computational Geometry (SoCG), 2016
- [7] S. Fekete, A. Haas, M. Hemmer, M. Hoffmann, I. Kostitsyna, D. Krupke, F. Maurer, J. Mitchell, A. Schmidt, C. Schmidt, J. Troegel, "Computing Nonsimple Polygons of Minimum Perimeter," in 15th International Symposium on Experimental Algorithms (SEA), 2016
- [8] I. Kostitsyna, M. Nöllenburg, V. Polishchuk, A. Schulz, D. Strash, "On Minimizing Crossings in Storyline Visualizations," in 23rd International Symposium on Graph Drawing and Network Visualization (GD), 2015
- [9] K. Burke, E. Demaine, R. Hearn, A. Hesterberg, M. Hoffmann, H. Ito, I. Kostitsyna, M. Löffler, Yu. Uno, A. Williams, "Single-Player and Two-Player Buttons & Scissors Games" in 18th Japan Conference on Discrete and Computational Geometry and Graphs, 2015
- [10] O. Aichholzer, M. Biro, E. Demaine, M. Demaine, D. Eppstein, S. Fekete, A. Hesterberg, I. Kostitsyna, C. Schmidt, "Folding Polyominoes into (Poly)Cubes," in 27th Canadian Conference on Computational Geometry (CCCG), 2015
- [11] I. Kostitsyna, M. Löffler, V. Polishchuk, "Optimizing airspace closure with respect to politicians' egos," in Special issue of Theoretical Computer Science on Fun with Algorithms, vol. 586, 2015
- [12] I. Kostitsyna, M. van Kreveld, M. Löffler, B. Speckmann, F. Staals, "Trajectory Grouping Structure under Geodesic Distance," in 31st International Symposium on Computational Geometry (SoCG), 2015
- [13] K. Buchin, I. Kostitsyna, M. Löffler, R. Silveira, "Region-based Approximation Algorithms for Visibility between Imprecise Locations," in 17th Workshop on Algorithm Engineering and Experiments (ALENEX), 2015
- [14] H. Alt, E. Arkin, A. Efrat, G. Hart, F. Hurtado, I. Kostitsyna, A. Kröller, J. S. B. Mitchell, V. Polishchuk, "Scandinavian Thins on Top of Cake: New and Improved Algorithms for Stacking and Packing," in Special issue of Theory of Computing Systems on Fun with Algorithms, vol. 54(4), 2014
- [15] I. Kostitsyna, J. S. B. Mitchell, A. Yousefi, "Airspace design with explicit utilization of convective weather forecast data for reduced traffic flow management actions," in IEEE/AIAA Digital Avionics Systems Conference (DASC), 2013
- [16] A. Yousefi, T. Myers, J. Mitchell, I. Kostitsyna, R. Sharma, "Robust airspace design methods for uncertain traffic and weather," in IEEE/AIAA Digital Avionics Systems Conference (DASC), 2013
- [17] M. Biro, J. Gao, J. Iwerks, I. Kostitsyna, J. Mitchell, "Beacon Routing and Coverage Problems," in Algorithms and Data Structures Symposium (WADS), 2013

- [18] M. Biro, J. Gao, J. Iwerks, I. Kostitsyna, J. Mitchell, "Combinatorics of Beacon Routing and Coverage," in Canadian Conference on Computational Geometry (CCCG) 2013
- [19] D. Kirkpatrick, I. Kostitsyna, V. Polishchuk, "Hardness Results for Two-Dimensional Curvature-Constrained Motion Planning," in 23rd Canadian Conference on Computational Geometry (CCCG), 2011
- [20] I. Kostitsyna, V. Polishchuk, "Simple Wriggling is Hard unless you are a Fat Hippo," in Special issue of Theory of Computing Systems on Fun with Algorithms, vol. 50(1), 2010
- [21] G. Sabhnani, A. Yousefi, D. Kierstead, I. Kostitsyna, J. Mitchell, V. Polishchuk, "Algorithmic Traffic Abstraction and its Application to NextGen Generic Airspace," in AIAA Aviation Technology, Integration and Operations Conference (ATIO), 2010
- [22] E. Arkin, G. Hart, J. Kim, I. Kostitsyna, J. Mitchell, G. Sabhnani, S. Skiena, "The Embroidery Problem," in 20th Canadian Conference on Computational Geometry (CCCG), 2008

Workshop Presentations

- [23] P. Bose, I. Kostitsyna, S. Langerman. "Self-approaching paths in simple polygons," in European Workshop on Computational Geometry (EuroCG), 2017
- [24] I. Kostitsyna, B. Speckmann, K. Verbeek, "Non-crossing drawings of multiple geometric Steiner arborescences," in European Workshop on Computational Geometry (EuroCG), 2017
- [25] R. Gmyr, I. Kostitsyna, F. Kuhn, C. Scheideler, T. Strothmann, "Non-crossing drawings of multiple geometric Steiner arborescences," in European Workshop on Computational Geometry (EuroCG), 2017
- [26] J. Gudmundsson, I. Kostitsyna, M. Löffler, V. Sacristán, R. Silveira, "Beaconless geocast protocols are interesting, even in 1D," in European Workshop on Computational Geometry (EuroCG), 2016
- [27] Q. Bouts, W. Meulemans, I. Kostitsyna, W. Sonke, M. van Kreveld, K. Verbeek, "Mapping polygons to the grid with small Hausdorff and Fréchet distance," in European Workshop on Computational Geometry (EuroCG), 2016
- [28] I. Kostitsyna, M. Löffler, V. Polishchuk, F. Staals, "On the complexity of minimum-link path problems," in XVI Spanish Meeting on Computational Geometry, 2015
- [29] E. Chambers, I. Kostitsyna, M. Löffler, F. Staals, "Homotopy Measures for Representative Trajectories," in European Workshop on Computational Geometry (EuroCG), 2015
- [30] I. Kostitsyna, J. Mitchell, "Robust Redesign of Airspace Sectorizations", in Lorenz Center Workshop "Geometric Algorithms in the Field", (poster), 2014
- [31] K. Buchin, I. Kostitsyna, M. Löffler, R. Silveira, "Region-based approximation of probability distributions (for visibility between imprecise points among obstacles)," in European Workshop on Computational Geometry (EuroCG), 2014
- [32] I. Kostitsyna, J. Mitchell, "Local redesigning of airspace sectors," in 9th Dutch Computational Geometry Day, 2013
- [33] I. Kostitsyna, J. Mitchell, G. Sabhnani, "Balancing controllers' workload by locally redesigning airspace sectors," in Computational Geometry: Young Researchers Forum (CG:YRF), 2012

[34] M. Biro, J. Gao, J. Iwerks, I. Kostitsyna, J. Mitchell, "Beacon Based Structures in Polygonal Domains," in Computational Geometry: Young Researchers Forum (CG:YRF), 2012

[35] M. Biro, J. Gao, J. Iwerks, I. Kostitsyna, J. Mitchell, "Beacon Based Routing and Coverage," in Fall Workshop on Computational Geometry (FWCG), 2011

[36] E. Arkin, I. Kostitsyna, J. Mitchell, V. Polishchuk, G. Sabhnani, "The Districting Problem," Fall Workshop on Computational Geometry (FWCG), 2009

INVITED TALKS AND RESEARCH VISITS

Invited Workshop Lectures

- "Beacon-based Routing and Art Gallery Problems," CMO-BIRS Workshop on "Searching and Routing in Discrete and Continuous Domains", 2015

International Research Visits

- Presentation "Beacon-based Routing and Art Gallery Problems" at Department of Applied Mathematics, Universitat Politècnica de Catalunya, Spain, 2015
- Presentation "On the complexity of minimum-link path problems" at Laboratoire d'Informatique Fondamentale, Aix-Marseille University, France, 2015
- Institute of Operating Systems and Computer Networks, Technische Universität Braunschweig, Germany, 2014
- Department of Applied Mathematics and Statistics, Stony Brook University, NY, USA, 2014
- Presentation "Beacon Based Routing and Coverage" at Computer Science Department, University of Helsinki, Finland, 2012

COMMUNITY INVOLVEMENT

Conferences organized

- 10th Dutch Computational Geometry Day, Utrecht, the Netherlands, 2015

Program committee memberships

- 29th Canadian Conference on Computational Geometry, 2017
- 25th Multimedia Exposition in Computational Geometry (CG:MM), was held as part of Computational Geometry Week 2016

Conferences and Journals refereed for

- International Journal of Computational Geometry & Applications (IJCGA)
- Theoretical Computer Science (TCS)
- SIAM Journal on Computing (SICOMP)
- Journal of Guidance, Control, and Dynamics (JGCD)
- Annual Symposium on Computational Geometry (SoCG)
- Annual European Symposium on Algorithms (ESA)
- International Symposium on Graph Drawing (GD)
- International Colloquium on Automata, Languages and Programming (ICALP)
- Latin American Theoretical Informatics (LATIN)
- International Frontiers of Algorithmics Workshop and International Conference on Algorithmic Aspects of Information and Management (FAW-AAIM)

INTERNATIONAL WORKSHOPS ATTENDED (by invitation only)

- Dagstuhl Seminar 17072 "Applications of Topology to the Analysis of 1-Dimensional Objects", 2017

- Dagstuhl Seminar 16271 “Algorithmic Foundations of Programmable Matter”, 2016
- Japan-Dutch Workshop on “Kinetic Geometric Networks”, 2016
- 31st Bellairs Winter Workshop on Computational Geometry, 2016
- CMO-BIRS Workshop on “Searching and Routing in Discrete and Continuous Domains”, 2015
- 2nd Workshop on Drawing Algorithms for Networks in Changing Environments, 2015
- 30th Bellairs Winter Workshop on Computational Geometry, 2015
- 1st Workshop on Drawing Algorithms for Networks of Changing Entities, 2014
- 29th Bellairs Winter Workshop on Computational Geometry, 2014

TEACHING EXPERIENCE

Instructor	Department of Mathematics and Computer Science, Technische Universiteit Eindhoven, Eindhoven, the Netherlands	2014—2016 2017—present
Teaching Assistant	Computer Science Department, Stony Brook University, Stony Brook, USA	2007—2009
Teacher	School of General Education #5 (with specialization in Mathematics, Physics and Informatics), Dolgoprudny, Russia	2001—2007

PROFESSIONAL EXPERIENCE

Software Engineer Intern	Google Inc, New York, NY	Summer 2010, Summer 2011
Data Analyst	NIX, Moscow, Russia	2003—2006

PUBLIC ACTIVITIES

- President of the club Women in Computer Science (ACM-W) 2008—2011
- Member of the Stony Brook Table Tennis team 2007—2008

LANGUAGES

Russian (native), English (fluent)