

# Ahmad Biniiaz

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401 Sunset Ave, Windsor, ON N9B 3P4, Canada

## Education

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**PhD in computer science** 2013-2017  
*Carleton University, Canada*

**Masters degree in computer science**  
*Shiraz University, Iran*

**Bachelor degree in computer engineering**  
*Bu-Ali Sina University, Iran*

## Academic Work Experience

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**Assistant Professor** (tenure-track) July 2019-present  
*School of Computer Science, University of Windsor, Canada*

**Adjunct Professor** May 2020-present  
*School of Computer Science, Carleton University*

**NSERC postdoctoral fellow** Sep. 2017-June 2019  
*University of Waterloo, Canada*

**Fields Institute postdoctoral fellow** Jan. 2017-Aug. 2019  
*Carleton University, Canada*

## Current Research Interests

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- Algorithm Design and Analysis
- Discrete and Computational Geometry
- Approximation Algorithms
- Enumerative Combinatorics
- Graph Drawing and Visualization
- Data Structures

## Teaching

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### University of Windsor:

- Theoretical Foundations of Computer Science (COMP-2310) - **undergrad** Winter 2021
- Key Concepts in Computer Science (COMP-1000) - **undergrad** Winter 2021
- Computational Geometry and Its App. (COMP-8570) - **grad course** Fall 2020
- Computational Geometry and Its App. (COMP-8570) - **grad course** Winter 2020
- Key Concepts in Computer Science (COMP-1000) - **undergrad** Fall 2019

### University of Waterloo:

- Data Structures and Data Management (CS240)<sup>1</sup> - **undergrad** Spring 2019
- Data Structures and Data Management (CS240)<sup>2</sup> - **undergrad** Spring 2018

### Carleton University:

- Enrichment Mini Courses Program (EMCP)<sup>3</sup> - **high school level** May 2015

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<sup>1</sup> Evaluation score: 4.04 (out of 5).

<sup>2</sup> Evaluation score: 4.23 (out of 5). Ranked among “**top instructors**” of the department.

<sup>3</sup> An annual program designed for high school students of Eastern Ontario and Western Quebec.

## Student Supervision and Co-supervision

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|-------------------------------------|-------------|-----------------------|-----------------------|
| • <a href="#">Patrick Devaney</a>   | BSc honors  | University of Windsor | Fall 2020-present     |
| • <a href="#">Zhikai Lin</a>        | Masters     | University of Windsor | Fall 2020-present     |
| • <a href="#">Yunkai Wang</a>       | Masters     | Carleton University   | Summer 2020-present   |
| • <a href="#">Rishav Chatterjee</a> | Masters     | University of Windsor | Fall 2019-present     |
| • <a href="#">Zhikai Lin</a>        | BSc honors  | University of Windsor | Fall 2019-Winter 2020 |
| • <a href="#">Kimberly Crosbie</a>  | Masters     | Carleton University   | Fall 2014-Winter 2017 |
| • Chris Saxton                      | BSc honors  | Carleton University   | Winter 2017           |
| • <a href="#">Lei Chen</a>          | BSs honors  | Carleton University   | Winter 2016           |
| • Evren Kaya                        | DSRI intern | Carleton University   | Summer 2015           |

## Research Grants

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2020-25	NSERC Discovery Grant (early-career) <i>Natural Sciences and Engineering Research Council of Canada</i>	\$182,500
2019	Startup Grant <i>University of Windsor</i>	\$55,000
2017-19	NSERC Postdoctoral Fellowship <i>Natural Sciences and Engineering Research Council of Canada</i>	2 × \$45,000
2017	Fields Institute Postdoctoral Award <i>Fields Institute and Carleton University</i>	\$35,000
2016-17	Ontario Graduate Scholarship (OGS) <i>Government of Ontario and Carleton University</i>	\$15,000
2015-16	Ontario Graduate Scholarship (OGS) <i>Government of Ontario and Carleton University</i>	\$15,000

## Competitive Academic Awards

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2016-17	Hamlin Graduate Fellowship <i>Dean of Graduate Studies, Carleton University</i>	\$3,000
2016-17	CUASA Scholarship <i>Carleton University Academic Staff</i>	\$2,000
2015-16	Hamlin Graduate Fellowship <i>Dean of Graduate Studies, Carleton University</i>	\$2,000
2015-16	CUASA Scholarship <i>Carleton University Academic Staff</i>	\$2,698
2015-16	David and Rachel Epstein Foundation Scholarships <i>Carleton University</i>	\$1,000
2015-16	GSA Student Parent Award <i>Graduate Students' Association, Carleton University</i>	\$500
2015	Best student presentation award in CALDAM 2015 <i>Springer</i>	€200
2014-15	Indira Gandhi Memorial Fellowship <i>Dean of Graduate and Postdoctoral Affairs, Carleton University</i>	\$10,000
2013-14	Indira Gandhi Memorial Fellowship <i>Dean of Graduate and Postdoctoral Affairs, Carleton University</i>	\$10,000

## Graduate Scholarships

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2013-16	Research Assistantship <i>Carleton University</i>	4 × \$14,000
2013-16	Teaching Assistantship <i>Carleton University</i>	4 × \$10,129

## Contributions to the Scientific Community

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### Program Committee Memberships:

- PC **co-chair** of the 4th Iranian Conference on Computational Geometry (ICCG 2021)
- PC member of the 17th Algorithms and Data Structures Symposium (WADS 2021)
- PC member of the 32nd Canadian Conference on Computational Geometry (CCCG 2020)
- PC member of the 36th European Workshop on Computational Geometry (EuroCG 2020)
- PC member of the 31st Canadian Conference on Computational Geometry (CCCG 2019)
- PC member of the 2nd Iranian Conference on Computational Geometry (ICCG 2019)
- PC member of the 29th Canadian Conference on Computational Geometry (CCCG 2017)

### Academic Committee Memberships:

- Hiring Committee, School of Computer Science, University of Windsor (Sep. 2019-April 2020)
- PhD Admissions and Progress Committee, School of Computer Science, University of Windsor (Oct. 2020-present)
- VP of Computer Science Graduate Society, Carleton University (2014-2016)

### Administrative Activities:

- Coaching an ACM ICPC Programming team, University of Windsor, Fall 2019-present.
- Organizer of the Fields Workshop on Discrete and Computational Geometry, Ottawa, 2017.
- Organizer of the 29th Canadian Conference on Computational Geometry, Ottawa, 2017.

### Invited to: (by invitation only workshops)

- 9<sup>th</sup> Workshop on Geometry and Graphs, McGill Bellairs Research Institute, Barbados, 2021.
- 8<sup>th</sup> Workshop on Geometry and Graphs, McGill Bellairs Research Institute, Barbados, 2020.
- 7<sup>th</sup> Workshop on Geometry and Graphs, McGill Bellairs Research Institute, Barbados, 2019.
- 6<sup>th</sup> Workshop on Geometry and Graphs, McGill Bellairs Research Institute, Barbados, 2018.
- NII Shonan Meeting on Geometric Graphs: Theory and Applications, Japan, 2017.
- 5<sup>th</sup> Workshop on Geometry and Graphs, McGill Bellairs Research Institute, Barbados, 2017.
- 4<sup>th</sup> Workshop on Geometry and Graphs, McGill Bellairs Research Institute, Barbados, 2016.

### Invited Talks:

- Some problems in discrete and computational geometry, Concordia University, July 2020.
- Some problems in discrete and computational geometry, University of Bristol, February 2019.
- Packing plane spanning trees into point sets, Graphs@Ryerson research group seminar, Ryerson University, October 2018.

## Referee:

- **Journals:** SIDMA, Algorithmica, DCG, JoCG, IJCGA, CGTA, IPL, JDA, IJGIS
- **Conferences:** WADS'21, SoCG'21, STACS'21, ICCG'21, WG'21, FSTTCS'20, LATIN'20, SoCG'20, SWAT'20, CiE'20, GD'19, ICALP'18, SoCG'18, GD'18, WG'18, COCOON'18, ESA'16, SoCG'17, STACS'17, IWOCA'17, CALDAM'16, CCCG'15

## Publications

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Note: **A\*** indicates top leading venues in my research field and **A** indicates highly-respected venues.

### Currently Under Review

4. *A short proof of the non-biplanarity of  $K_9$ .*  
A. Biniáz.
3. *Improved approximation ratios for two Euclidean maximum spanning tree problems.*  
A. Biniáz.
2. *Simple linear time algorithms for piercing pairwise intersecting disks.*  
A. Biniáz, P. Bose, and Y. Wang.
1. *Token swapping on trees.*  
A. Biniáz, K. Jain, A. Lubiw, Z. Masárová, T. Miltzow, D. Mondal, A. Murty Naredla, J. Tkadlec, and A. Turcotte

### Journal Papers

31. *A short proof of the toughness of Delaunahy triangulations.*  
A. Biniáz.  
Journal of Computational Geometry, 12(1): 35–39, 2021, **A\***.
30. *On the minimum consistent subset problem.*  
A. Biniáz, S. Cabello, A. Maheshwari, P. Carmi, S. Mehrabi, J.-L. De Carufel, and M. Smid.  
Algorithmica, 2021, **A\***.
29. *Euclidean bottleneck bounded-degree spanning tree ratios.*  
A. Biniáz.  
Discrete & Computational Geometry, 2021, **A\***.
28. *Faster algorithms for some optimization problems on collinear points.*  
A. Biniáz, P. Bose, P. Carmi, A. Maheshwari, I. Munro, and M. Smid.  
Journal of Computational Geometry, 11(1): 418–432, 2020, **A\***.
27. *Plane hop spanners for unit disk graphs: Simpler and better.*  
A. Biniáz.  
Computational Geometry: Theory and Applications, 89, 2020, **A**.  
Special issue of WADS 2019.
26. *Minimum ply covering of points with discs and squares.*  
T. Biedl, A. Biniáz, and A. Lubiw.

Accepted to Computational Geometry: Theory and Applications, **A**.  
Special issue of CCCG 2019.

25. *Plane and planarity thresholds for random geometric graphs.*  
A. Biniáz, E. Kranakis, A. Maheshwari, M. Smid.  
Discrete Mathematics, Algorithms and Applications, 12(1): 2050005:1-2050005:21,  
2020, **A**.
24. *Packing plane spanning trees into a point set.*  
A. Biniáz and A. García.  
Computational Geometry: Theory and Applications, 90, 2020, **A**.  
Special issue of CCCG'18.
23. *Packing boundary-anchored rectangles and squares.*  
T. Biedl, A. Biniáz, A. Maheshwari, S. Mehrabi.  
Computational Geometry: Theory and Applications, 88, 2020, **A**.  
Special issue of CCCG'17.
22. *Bottleneck matchings and Hamiltonian cycles in higher-order Gabriel graphs.*  
A. Biniáz, A. Maheshwari, and M. Smid.  
Information Processing Letters, 153, 2020.
21. *Rollercoasters: long sequences without short runs.*  
T. Biedl, A. Biniáz, R. Cummings, A. Lubiw, F. Manea, D. Nowotka, J. Shallit.  
SIAM Journal on Discrete Mathematics, 33(2): 845–861, 2019, **A\***.
20. *Maximum plane trees in multipartite geometric graphs.*  
A. Biniáz, P. Bose, K. Crosbie, J.-L. De Carufel, D. Eppstein, A. Maheshwari, M.  
Smid.  
Algorithmica 81(4): 1512-1534, 2019, **A\***.
19. *Flip distance to some plane configurations.*  
A. Biniáz, A. Maheshwari, M. Smid.  
Computational Geometry: Theory and Applications, 81: 12-21, 2019, **A**.
18. *Improved bounds for guarding plane graphs with edges*  
A. Biniáz, P. Bose, A. Ooms, S. Verdonschot.  
Graphs and Combinatorics, 35(2): 437–450, 2019, **A**.
17. *Spanning trees in multipartite geometric graphs.*  
A. Biniáz, P. Bose, D. Eppstein, A. Maheshwari, P. Morin, M. Smid.  
Algorithmica, 80(11): 3177-3191, 2018, **A\***.
16. *Plane bichromatic trees of low degree.*  
A. Biniáz, P. Bose, A. Maheshwari, M. Smid.  
Discrete & Computational Geometry, 59(4): 864–885, 2018, **A\***.
15. *Strong matching of points with geometric shapes.*  
A. Biniáz, A. Maheshwari, M. Smid.  
Computational Geometry: Theory and Applications, 68: 186–205, 2018, **A**.  
Special issue in memory of Dr. Ferran Hurtado.
14. *Faster algorithms for the minimum red-blue-purple spanning graph problem.*  
A. Biniáz, P. Bose, I. van Duijn, A. Maheshwari, M. Smid.  
Journal of Graph Algorithms and Applications, 21(4): 527–546, 2017, **A**.

13. *Towards plane spanners of degree 3.*  
A. Biniáz, P. Bose, J.-L. De Carufel, C. Gavoille, A. Maheshwari, M. Smid.  
Journal of Computational Geometry, 8(1): 11–31, 2017, **A\***.
12. *An optimal algorithm for plane matchings in multipartite geometric graphs.*  
A. Biniáz, A. Maheshwari, S. Nandy, M. Smid.  
Computational Geometry: Theory and Applications, 63: 1–9, 2017, **A**.
11. *Approximation algorithms for the unit disk cover problem in 2D and 3D.*  
A. Biniáz, P. Liu, A. Maheshwari, M. Smid.  
Computational Geometry: Theory and Applications, 60: 8–18, 2017, **A**.  
Special issue of CCCG'15
10. *A plane 1.88-spanner for points in convex position.*  
M. Amani, A. Biniáz, P. Bose, J.-L. De Carufel, A. Maheshwari, M. Smid.  
Journal of Computational Geometry, 7(1): 520–539, 2016, **A\***.
9. *Plane geodesic spanning trees, Hamiltonian cycles, and perfect matchings in a simple polygon.*  
A. Biniáz, P. Bose, A. Maheshwari, M. Smid.  
Computational Geometry: Theory and Applications, 57: 27–39, 2016, **A**.
8. *Packing plane perfect matchings into a point set.*  
A. Biniáz, P. Bose, A. Maheshwari, M. Smid.  
Discrete Mathematics and Theoretical Computer Science, 17(2): 119–142, 2015, **A**.
7. *Higher-order triangular-distance Delaunay graphs: graph-theoretical properties.*  
A. Biniáz, A. Maheshwari, M. Smid.  
Computational Geometry: Theory and Applications, 48(9): 646–660, 2015, **A**.
6. *Matchings in higher-order Gabriel graphs.*  
A. Biniáz, A. Maheshwari, M. Smid.  
Theoretical Computer Science, 596: 67–78, 2015, **A\***.
5. *On the hardness of the full Steiner tree problems.*  
A. Biniáz, A. Maheshwari, M. Smid.  
Journal of Discrete Algorithms, 34: 118–127, 2015, **A**.
4. *Approximating the bottleneck plane perfect matching of a point set.*  
K. Abu-Affash, A. Biniáz, P. Carmi, A. Maheshwari, M. Smid.  
Computational Geometry: Theory and Applications, 48(9): 718–731, 2015, **A**.
3. *On full Steiner trees in unit disk graphs.*  
A. Biniáz, A. Maheshwari, M. Smid.  
Computational Geometry: Theory and Applications, 48(6): 453–458, 2015, **A**.
2. *Fixed-orientation equilateral triangle matching of point sets.*  
J. Babu, A. Biniáz, A. Maheshwari, M. Smid.  
Theoretical Computer Science, 555: 55–70, 2014, **A\***.  
Special issue of WALCOM'13.
1. *An optimal algorithm for the Euclidean bottleneck full Steiner tree problem.*  
A. Biniáz, A. Maheshwari, M. Smid.  
Computational Geometry: Theory and Applications, 47(3), 377–380, 2014, **A**.

## Conference papers

37. *Euclidean maximum matchings in the plane—local to global.*  
A. Biniáz, A. Maheshwari, and M. Smid.  
Accepted to the 17th International Symposium on Algorithms and Data Structures (WADS), 2021, **A**.
36. *On the spanning and routing ratio of the directed Theta-six graph.*  
H. Akitaya, A. Biniáz and P. Bose.  
Accepted to the 17th International Symposium on Algorithms and Data Structures (WADS), 2021, **A**.  
Also appeared in ICCG'21.
35. *The minimum moving spanning tree problem.*  
H. Akitaya, A. Biniáz, P. Bose, J.-L. De Carufel, A. Maheshwari, L. F. Schultz Xavier da Silveira and M. Smid.  
Accepted to the 17th International Symposium on Algorithms and Data Structures (WADS), 2021, **A**.  
Also appeared in ICCG'21.
34. *Better approximation algorithms for the maximum weight internal spanning tree problem in cubic graphs and claw-free graphs.*  
A. Biniáz.  
In Proceedings of the 15th International Conference and Workshops on Algorithms and Computation (WALCOM), pages 260–271, 2021.
33. *Euclidean bottleneck bounded-degree spanning tree ratios.*  
A. Biniáz.  
In Proceedings of the 30th ACM-SIAM Symposium on Discrete Algorithms (SODA), pages 826–836, 2020; 30% acceptance rate, **A\***.
32. *A short proof of the toughness of Delaunay triangulations.*  
A. Biniáz.  
In Proceedings of the 3rd SIAM Symposium on Simplicity in Algorithms (SOSA), pages 43–46, 2020; 22% acceptance rate, **A\***.
31. *Bounded-angle minimum spanning trees.*  
A. Biniáz, P. Bose, A. Lubiw, and A. Maheshwari.  
In Proceedings of the 17th Scandinavian Symposium and Workshops on Algorithm Theory (SWAT), 14:1–14:22, 2020; 29% acceptance rate, **A**.
30. *Minimum ply covering of points with convex shapes.*  
A. Biniáz and Z. Lin.  
To appear in the Proceedings of the 32nd Canadian Conference on Computational Geometry (CCCG 2020).
29. *Plane hop spanners for unit disk graphs.*  
A. Biniáz.  
In Proceedings of the 16th International Symposium on Algorithms and Data Structures (WADS), pages 140–151, 2019, **A**.
28. *On the minimum consistent subset problem.*  
A. Biniáz, S. Cabello, A. Maheshwari, P. Carmi, S. Mehrabi, J.-L. De Carufel, and



- M. Smid.  
In Proceedings of the 16th International Symposium on Algorithms and Data Structures (WADS), pages 155–167, 2019, **A**.
27. *Maximum matchings and minimum blocking sets in Theta-6 graphs.*  
T. Biedl, A. Biniarz, V. Irvine, K. Jain, P. Kindermann, and A. Lubiw  
In Proceedings of the the 45th International Workshop on Graph-Theoretic Concepts in Computer Science (WG), pages 258–270, 2019; 34.5% acceptance rate, **A**.  
Also appeared in EuroCG’19.
26. *Minimum ply covering of points with discs and squares.*  
T. Biedl, A. Biniarz, and A. Lubiw.  
In Proceedings of the 31st Canadian Conference in Computational Geometry (CCCG), pages 226–235, 2019.
25. *Three-coloring three-dimensional uniform hypergraphs.*  
A. Biniarz, P. Bose, J. Cardinal, and M. Payne.  
In Proceedings of the 31st Canadian Conference in Computational Geometry (CCCG), pages 23–28, 2019.
24. *Rollercoasters and caterpillars.*  
T. Biedl, A. Biniarz, R. Cummings, A. Lubiw, F. Manea, D. Nowotka, and J. Shallit.  
In Proceedings of the 45th International Colloquium on Automata, Languages, and Programming (ICALP), pages 18:1–18:15, 2018; 28.3% acceptance rate, **A\***.  
Also appeared in EuroCG’18.
23. *Improved bounds for guarding plane graphs with edges.*  
A. Biniarz, P. Bose, A. Ooms, and S. Verdonschot.  
In Proceedings of the 16th Scandinavian Symposium and Workshops on Algorithm Theory (SWAT), pages 14:1–14:12, 2018; 34.1% acceptance rate, **A**.
22. *Flip distance to some plane configurations.*  
A. Biniarz, A. Maheshwari, M. Smid.  
In Proceedings of the 16th Scandinavian Symposium and Workshops on Algorithm Theory (SWAT), pages 11:1–11:14, 2018; 34.1% acceptance rate, **A**.
21. *On the size of outer-string representations.*  
T. Biedl, A. Biniarz, and M. Derka  
In Proceedings of the 16th Scandinavian Symposium and Workshops on Algorithm Theory (SWAT), pages 10:1–10:14, 2018; 34.1% acceptance rate, **A**.
20. *Faster algorithms for some optimization problems on collinear points.*  
A. Biniarz, P. Bose, P. Carmi, A. Maheshwari, I. Munro, and M. Smid.  
In Proceedings of the 34th International Symposium on Computational Geometry (SoCG), pages 8:1–8:14, 2018; 35.4% acceptance rate, **A\***.
19. *Packing plane spanning trees into a point set.*  
A. Biniarz and A. García.  
In Proceedings of the 30th Canadian Conference in Computational Geometry (CCCG), pages 49–53, 2018.
18. *Compatible 4-holes in point sets.*  
A. Biniarz, A. Maheshwari, M. Smid.

- In Proceedings of the 30th Canadian Conference in Computational Geometry (CCCG), pages 346–352, 2018.
17. *Integral unit bar-visibility graphs.*  
T. Biedl, A. Biniáz, V. Irvine, P. Kindermann, A. M. Naredla, A. Turcotte.  
In Proceedings of the 30th Canadian Conference in Computational Geometry (CCCG), pages 230–246, 2018.
  16. *Compatible paths on labelled point sets.*  
Y. Bahoo, A. Biniáz, P. Cano, F. Chanchary, J. Iacono, K. Jain, E. Khramtcova, A. Lubiw, D. Mondal, K. Sheikhan, C. D. Tóth.  
In Proceedings of the 30th Canadian Conference in Computational Geometry (CCCG), pages 54–60, 2018.
  15. *Maximum plane trees in multipartite geometric graphs.*  
A. Biniáz, P. Bose, K. Crosbie, J.-L. De Carufel, D. Eppstein, A. Maheshwari, and M. Smid.  
In Proceedings of the 15th International Symposium on Algorithms and Data Structures (WADS), pages 193–204, 2017, **A**.
  14. *Packing boundary-anchored rectangles.*  
T. Biedl, A. Biniáz, A. Maheshwari, and S. Mehrabi.  
In Proceedings of the 29th Canadian Conference on Computational Geometry (CCCG), pages 138–143, 2017.
  13. *Towards plane spanners of degree 3.*  
A. Biniáz, P. Bose, A. Maheshwari, J.-L. De Carufel, C. Gavoille, and M. Smid.  
In Proceedings of the 27th International Symposium on Algorithms and Computation (ISAAC), pages 19:1–19:14, 2016, **A**.
  12. *A faster algorithm for the minimum red-blue-purple spanning graph problem for points on a circle.*  
A. Biniáz, P. Bose, I. van Duijn, A. Maheshwari, and M. Smid.  
In Proceedings of the 28th Canadian Conference on Computational Geometry (CCCG), pages 140–146, 2016.
  11. *Plane bichromatic trees of low degree.*  
A. Biniáz, P. Bose, A. Maheshwari, and M. Smid.  
In Proceedings of the 27th International Workshop on Combinatorial Algorithms (IWOCA), pages 68–80, 2016, **A**.
  10. *A plane 1.88-spanner for points in convex position.*  
M. Amani, A. Biniáz, P. Bose, J.-L. De Carufel, A. Maheshwari, and M. Smid.  
In Proceedings of the 15th Scandinavian Symposium and Workshops on Algorithm Theory (SWAT), pages 25:1–25:14, 2016; 33.3% acceptance rate, **A**.
  9. *Bottleneck matchings and Hamiltonian cycles in higher-order Gabriel graphs.*  
A. Biniáz, A. Maheshwari, and M. Smid.  
In the 32nd European Workshop on Computational Geometry (EuroCG), pages 179–182, 2016.
  8. *Plane and planarity thresholds for random geometric graphs.*  
A. Biniáz, E. Kranakis, A. Maheshwari, and M. Smid.

- In Proceedings of the 11th International Symposium on Algorithms and Experiments for Wireless Sensor Networks (ALGOSENSORS), pages 1–12, 2015, **A**.
7. *Plane geodesic spanning trees, Hamiltonian cycles, and perfect matchings in a simple polygon.*  
A. Biniáz, P. Bose, A. Maheshwari, and M. Smid.  
In Proceedings of the first International Conference on Topics in Theoretical Computer Science (TTCS), pages 56–71, 2016; 23% acceptance rate.
  6. *A faster 4-approximation algorithm for the unit disk cover problem.*  
A. Biniáz, P. Liu, A. Maheshwari, and M. Smid.  
In Proceedings of the 27th Canadian Conference on Computational Geometry (CCCG), pages 262–267, 2015.
  5. *An optimal algorithm for plane matchings in multipartite geometric graphs.*  
A. Biniáz, A. Maheshwari, S. Nandy, and M. Smid.  
In Proceedings of the 14th Algorithms and Data Structures Symposium (WADS), pages 66–78, 2015, **A**.
  4. *Higher-order triangular-distance Delaunay graphs: graph-theoretical properties.*  
A. Biniáz, A. Maheshwari, and M. Smid.  
In Proceedings of the first International Conference on Algorithms and Discrete Applied Mathematics (CALDAM), pages 89–100, 2015, **A**.
  3. *Approximating full Steiner tree in a unit disk graph.*  
A. Biniáz, A. Maheshwari, and M. Smid.  
In Proceedings of the 26th Canadian Conference in Computational Geometry (CCCG), pages 113–117, 2014.
  2. *Bottleneck bichromatic plane matching of points.*  
A. Biniáz, A. Maheshwari, and M. Smid.  
In Proceedings of the 26th Canadian Conference in Computational Geometry (CCCG), pages 431–435, 2014.
  1. *Fixed-orientation equilateral triangle matching of point sets.*  
J. Babu, A. Biniáz, A. Maheshwari, and M. Smid.  
In Proceedings of the 7th International Workshop on Algorithms and Computation (WALCOM), pages 17–28, 2013; 33.7% acceptance rate, **A**.

## Thesis

2. *Matchings in geometric graphs.*  
A. Biniáz.  
PhD thesis, School of Computer Science, Carleton University, 2017.
1. *Constrained higher order Delaunay triangulations.*  
A. Biniáz.  
Master’s thesis, Computer Engineering Department, Shiraz University.