

Hee-Kap Ahn *Professor*

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Research Interest

*I am interested in most areas of **algorithms**, especially in **computational geometry**, the study of design and analysis of algorithms on geometry and optimization problems.*

Computational geometry has evolved from a sub-discipline of theoretical computer science, but it has developed in several directions and forged links with other application areas with interest in geometric computing, such as computer aided (geometric) design, computer aided manufacturing, robotics, computer graphics, virtual reality, computer vision, bioinformatics (computational biology) and geographic information systems.

I have been working on **approximation algorithms** for geometric optimization problems, that is, an interesting paradigm for the design of algorithms that returns near-optimal solutions efficiently. Most natural optimization problems, including those arising in important application areas, are NP-hard, therefore, their exact solution is prohibitively time consuming and research into approximability of these problems becomes a compelling subject in computer science. Approxima-

tion algorithms are often surprisingly simple yet practical and efficient.

I have also been working on **shape matching** and **shape analysis**. Shape matching is the study of algorithms to compute the similarity between shapes, and it is an important ingredient in shape retrieval from a large database, shape recognition, classification, alignment and registration, and shape approximation and simplification. In shape analysis, we are interested in the structural and combinatorial properties of a shape, such as the location of its (geodesic) center, the subdivision of a shape with respect to sites under geodesic metric, and the smallest/largest figures containing or contained in a shape. Another interesting problem is maintaining geometric structures such as the convex hulls and the Voronoi diagrams of points in a shape in dynamic environments.

I also have a keen interest in **nearest-neighbor search (NNS)** in high dimensions, which have applications in **computer vision** and **artificial intelligence**.

Professional Experience

Pohang University of Science and Technology

POHANG, KOREA

Professor

Sep '16 – Now

Department of Computer Science and Engineering

Associate Professor

Sep '10 – Aug '16

Department of Computer Science and Engineering

Assistant Professor

Jul '07 – Aug '10

Department of Computer Science and Engineering

Adjunct Professor

Sep '08 – Now

Department of Computer Science and Engineering

Sejong University

SEOUL, KOREA

Assistant Professor

Mar '06 – Jul '07

Department of Computer Science and Engineering

Korea Advanced Institute of Science and Technology

DAEJEON, KOREA

Research Assistant Professor

Feb '04 – Feb '06

Computer Science Division - replacement of military service.

Educational Qualifications

Utrecht University

UTRECHT, THE NETHERLANDS

Ph.D. in Computer Science with a topic in Theoretical Computer Science December 2001

Title of thesis : *Geometric Aspects of the Casting Process*

Dissertation committee : Professors Jan van Leeuwen (chair), Mark Overmars (advisor), Otfried Cheong (co-advisor), Mark de Berg, Prosenjit Bose, Siu-Wing Cheng, Peter van Emde Boas, Doaitse Swierstra, Arno Siebes

Pohang University of Science and Technology

POHANG, KOREA

Master of Science degree in Computer Science

February 1998

Title of thesis : *Casting with two-part cast: Opposite and Non-opposite cast removal*

Dissertation committee : Professors Otfried Schwarzkopf (advisor), Mark de Berg, Myung-Soo Kim

Kyungpook National University

DAEGU, KOREA

Bachelor of Engineering degree in Computer Engineering

February 1996

Professional Activities

Workshops and Seminars:

- Invited talk at Theoretische Informatik Abteilung I, University of Bonn, Germany (2019)
- Invited lectures at Department of Informatics, Kyushu University, Japan (2019)
- Japan-Austria Workshop on Computational Geometry at Zao Resort, Japan (2018)
- Korean Workshop on Computational Geometry at Rogla, Slovenia (2018)
- Invited talk at 14th International Conference on Computability and Complexity in Analysis, Korea (CCA 2017)
- Invited talk at the Workshop on Extreme-Scale Computing for Big Data Analytics, Australia (2016)
- Invited talk at SoC Colloquium of KAIST (2016)
- NII Shonan Meeting on Algorithmics for Beyond Planar Graphs, Shonan Center, Japan (2016)
- Invited talk at the AEARU Web Technology and Computer Science Workshop, Japan (AEARU-WTCS 2016)
- NII Shonan Meeting on Theory and Applications of Geometric Optimization, Shonan Center, Japan (2016)
- Korean Workshop on Computational Geometry (& Graph Drawing), Würzburg, Germany (2016)
- Invited Seminar Talk at School of ECE, UNIST (2015)
- Japan-Korea Joint Workshop on General Optimization: Polygon containment, packing, alignment, Zao resort, Japan (2015)
- Invited talk at Geometry Seminar, Courant Institute of Mathematical Sciences, New York University, United States (2014)
- Korean Workshop on Computational Geometry at Hiddensee Island, Germany (2014)
- Barbados workshop on Geometry and Graphs, Barbados (2014)
- Invited Talk at the 16th Korea-Japan Joint Workshop on Algorithms and Computation (2013)
- Japan-Korea Joint Workshop on Optimized Extraction of Geometric Information, Yamagata, Japan (2012)

- Korean Workshop on Computational Geometry at Hokkaido, Japan (2011)
- Korean Workshop on Computational Geometry at Dagstuhl, Germany (2010)
- Invited Lectures at Winter School on Algorithms and Combinatorics (2010)
- Invited talk at Colloquium of Dept. Computer Science, Bayreuth Univ., Germany (2010)
- Invited talk at KAIST Discrete Math Seminar, KAIST (2009)
- Dagstuhl Seminar on Geometric Networks, Germany (2009)
- Invited talk at Colloquium of Dept. Computer Science & Engineering, Chonbuk Univ. (2009)
- Talk at PMI Phylogenetic Combinatorics Seminar, POSTECH (2009)
- International Workshop on Discrete and Computational Geometry (2009)
- Talk at The 30th PNU-PMI Algebraic Combinatorics Seminar, PNU (2009)
- NICTA Workshop on Computational Geometry, Sydney, Australia (2008)
- Invited talk at Colloquium of Dept. Computer Science & Engineering, POSTECH (2006/2007)
- Dagstuhl Seminar on Geometric Networks and Metric Space Embeddings (2006) in Germany
- Workshop on Computational and Combinatorial Line Geometry (2006) in France(Ouessant Island)
- Invited talk at School of Computational Sciences, KIAS (2005)
- International Workshop on Discrete and Computational Geometry (2005) in Japan
- Colloquium of Dept. Computer Science & Engineering in POSTECH (2004)
- Dagstuhl Workshop on Computational Geometry and Geometric Networks (2004) in Germany
- Invited talk at Voronoi diagram Research Center in Hanyang University (2004)
- Invited talk at Dept. Computer Engineering in Kyungpook National University (2004)
- Korean Workshop on Computational Geometry (2002 – 2009)
- Dagstuhl Seminar on Computational Geometry (2001 and 2003) in Germany
- Utrecht Workshop on Computational Geometry (2000) in The Netherlands
- Workshop on Computational Geometry at HKUST (1997) in Hong Kong

Board members: Asian Association for Algorithms and Computation (AAAC)

Journal editorship: I am currently an editorial board member of

- Computational Geometry : Theory and Applications (CGTA) (2015–)
- Journal of Information Processing (JIP) (2012–)
- Interdisciplinary Information Sciences (IIS) (2013–)
- Journal of Discrete Algorithms (JDA) (2015–2018)
- Journal of Computational Geometry (JoCG) (2009–2012)
- Journal of Information Science and Engineering (JISE) (2011-2017)

Program committees: I was a PC co-chair of ISAAC 2014 (25th International Symposium on Algorithms and Computation (ISAAC 2014) and a PC member of

- SoCG¹ 2010 (26th) / 2014 (30th) / 2019 (35th): Annual Symposium on Computational Geometry
- WADS 2017: Algorithms and Data Structures Symposium
- ICALP 2015: 42nd International Colloquium on Automata, Languages, and Programming
- MFCS 2015: 40th International Symposium on Mathematical Foundation of Computer Science
- COCOON 2011 (17th) / 2013 (19th) / 2015 (21st) : Annual International Computing and Combinatorics Conference

¹SoCG is the top conference in computational geometry.

- ISAAC 2006 (17th) / 2013 (24th): Annual International Symposium on Algorithms and Computation
- EuroCG 2019 (35th): European Workshop on Computational Geometry
- FAW 2009 / 2015 / 2016 / 2018: International Frontiers of Algorithmics Workshop
- AAIM 2006 / 2007 / 2014 : Annual International Conference on Algorithmic Aspects in Information and Management
- CCCG 2013: 25th Canadian Conference on Computational Geometry
- FAW-AAIM 2011 / 2013: Joint Meeting of International Frontiers of Algorithmics Workshop and International Conference on Algorithmic Aspects of Information and Management
- WALCOM 2011 / 2012 / 2014 / 2018: International Workshop on Algorithms and Computation
- CATS 2011: 17th Computing: the Australasian Theory Symposium
- AAAC 2008–2018: Asian Association for Algorithms and Computation

Refereeing: I have been a referee for journals, mainly in the field of computational geometry, including

- Computational Geometry: Theory and Applications (CGTA)
- Algorithmica
- Discrete Computational Geometry (DCG)
- International Journal of Computational Geometry and Applications (IJCGA)
- Journal of Discrete Algorithms (JDA)
- Computer Aided Geometric Design (CAGD)
- Computers & Graphics
- Mathematics of Operations Research
- International Journal on Foundations of Computer Science
- European Journal of Operational Research
- Journal of Combinatorial Optimization (JoCO)
- GeoInformatika (GEIN)

Sub-Refereeing for conferences:

- ACM Symposium on Computational Geometry (SoCG),
- ACM-SIAM Symposium on Discrete Algorithms (SODA),
- ACM Symposium on Theory of Computing (STOC),
- European Symposium on Algorithms (ESA),
- International Symposium on Algorithms and Computation (ISAAC),
- International Computing and Combinatorics Conference (COCOON),
- IFIP International Conference on Theoretical Computer Science (IFIP TCS), and
- AAAC Annual Meeting (AAAC).

Organizing chairs:

- Fall Workshop on Algorithms and Computation (FWAC 2018). Seoul National University, Seoul, Korea. November 9–10, 2018.
- NII Shonan Meeting on “Geometric Graphs: Theory and Applications” (No. 106) *with Naoki Katoh and Subhas C. Nandy*. Shonan Village Center, Japan, October 30–November 2, 2017.
- Aslla Symposium on “Space Tessellation and Packing: Theory and Applications” (No. 2) *with Otfried Cheong and Christian Knauer*. KIST Gangneung, Korea. September 19–22, 2017.

- Fall Workshop on Algorithms and Computation (FWAC 2016) *with Yo-Sub Han and Heejin Park.* Yonsei University, Seoul, Korea. November 11–12, 2016.
- ISAAC 2014 (25th International Symposium on Algorithms and Computation (ISAAC 2014) *with Chan-Su Shin.* Jeonju, Korea. December 15–17, 2014.

Organizing committee members:

- 23rd ACM Symposium on Computational Geometry (SoCG) 2007, Gyeongju, South Korea.
- 16th ACM Symposium on Computational Geometry (SoCG) 2000, Hong Kong.
- Korean workshop on computational geometry (KWCG). I started and organized an international workshop on Computational Geometry in Jeju island in August 2002, and in Seoul in August 2003 (together with Dr. Chan-Su Shin). Since then it became an annual event under this name. I organize it again in 2008 at POSTECH, with Otfried Cheong and Antoine Vigneron.
- Dagstuhl Workshop on Computational Geometry and Geometric Networks, Germany. 2004 (with Alexander Wolff, Christian Knauer, René van Oostrum and Chan-Su Shin.)

Other activities:

- I was a committee member of International Olympiad in Informatics at KIESE (2013–2016, 2018)

Grants and Awards

Research grants:

- *Software Star Lab.* Optimal Data Structures and Algorithmic Applications in Dynamic Geometric Environment (2017/04/01 - 2024/12/31) - 2,400,000 USD
- *Science Research Center (SRC-NRF).* Surface Matching and Space Tessellations (2011/09/06 - 2018/08/31) - 1,260,000 USD
- *Hyundai Elevator Research Center.* Efficient algorithms for smart elevator call allocation system (2014/10/01-2015/5/31) - 70,000 USD
- *National Research Foundation.* Adaptive Computational Geometry (2009/05/01 - 2012/04/30) - 150,000 USD
- *National Research Foundation.* Algorithmic Aspects of Geometric Uncertainty (2010/05/01 - 2013/04/30) - 150,000 USD
- *NRF/JSPS Korea-Japan binational Research Grant.* Finding objects in geometric data: Theoretical algorithms for geometric matching, segmentation and covering (2010/07/01 -2012/06/30) - 24,000 USD
- *Hyundai Mobis Research Center.* Fast and Stable algorithms for path finding (2009/12/1 - 2010/11/31) - 50,000 USD
- *Postech BSRI.* Geometric Shape Approximation and Matching (2008/5/1 - 2009/2/28) - 20,000 USD
- *KRF/DAAD Korea-Germany Binational Research Grant.* - GEnKO : Korea-Germany Partnership Program Geometric Shape Approximation (2008/1/1 - 2010/12/31) - 26,000 USD
- *Korea Research Foundation.* Geometric Shape Matching in 3D: Design of efficient matching algorithms under rigid motions (2007/8/1 - 2009/7/31) - 40,000 USD
- *Postech BSRI.* Geometric Shape Matching (2007/9/1 - 2008/2/28) - 20,000 USD
- *Korea Research Foundation.* Approximation algorithms for shape matching in 3 dimensional space (2006/7/1 - 2007/6/30) - 20,000 USD

Awards:

- POSTECH Education Award (2017)
- Excellent Paper/Presentation Award at KIESE/KCC Conferences (2011/2012/2013/2015)

- Best Paper Award at 11th International Symposium on Spatial and Temporal Databases (SSTD 2009)
 - Research Fellowship(AIO) from Utrecht University, The Netherlands
 - Postgraduate Scholarships from Hong Kong University of Science & Technology and Pohang University of Science & Technology
 - Scholarship for academic excellence from Kyungpook National University
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Eudcational Experience

Ph.D. students I supervised:

- Dr. Wanbin Son (2014), Placement: Scientific researcher at KERI
Thesis: Geometric Algorithms for Geospatial Data: Skyline and Top-k Queries.
- Dr. Hyesun Lee (2015), Placement: Researcher at ETRI
Thesis: A Feature Model-based Method for Systematic Maintenance and Evolution of Product Lines.
- Dr. Sang-Sub Kim (2016), Placement: Postdoctoral researcher at Bonn University, Germany
Thesis: Euclidean Centers of Streaming and Imprecise Points.
- Dr. Dongwoo Park (2017), Placement: Researcher at Samsung SDS
Thesis: Bundling Problems in Geometric Optimization.
- Dr. Yoonho Hwang (2018), Placement: CEO of a company
Thesis: Fast Proximity Search Algorithms on the Euclidean Space.
- Dr. Eunjin Oh (2018), Placement: Postdoctoral researcher at Max-Planck Institute for Informatics, Germany
Thesis: Geometric Structures on Points inside a Simple Polygon.
- Dr. Sang Duk Yoon (2018), Placement: Researcher at Samsung Display
Thesis: Geometric Matching Algorithms for Terrain Data.

MSc students I supervised:

- Wanbin Son (2010)
Thesis: Skyline Queries in Metric Space.
- Sang-Sub Kim (2010)
Thesis: Covering Problems on a Point Set.
- Bingbing Zhuang (2013)
Thesis: A Representative Curve of k Curves with Respect to Fréchet Distance.
- Min-Gyu Kim (2016)
Thesis: Geometric Matching of Terrains: Algorithmic Analysis and Implementation.

Teaching experience:

- *Graph Theory and Algorithms* – CSED436 (2012–)
- *Discrete and Computational Geometry* – CSED508(was EECE508) (2011–)
- *Randomized Algorithms* – EECE701D (2011)
- *Algorithms* – CSED331 (2010–)
- *Approximation Algorithms* – EECE701C (2010)
- *Discrete Geometry* – EECE701B (2009)
- *Computational Geometry* – EECE701A (2008)
- *Research Project A/II* – CSED499 (2008)
- *Algorithm Design and Analysis* – CSED431 (2007/2008/2009)

Scientific Contributions

International Journal articles

53. Eunjin Oh, Hee-Kap Ahn.
Polygon Queries for Convex Hulls of Points.
Submitted (on invitation).
52. Hee-Kap Ahn, Taehoon Ahn, Sang Won Bae, Jongmin Choi, Mincheol Kim, Eunjin Oh, Chan-Su Shin, Sang Duk Yoon.
Minimum-Width Annulus with Outliers: Circular, Square, and Rectangular Cases.
Submitted.
51. Eunjin Oh, Hee-Kap Ahn.
Finding Pairwise Intersections of Rectangles in a Query Rectangle.
Submitted.
50. Eunjin Oh, Hee-Kap Ahn.
A New Balanced Subdivision of a Simple Polygon for Time-Space Trade-off Algorithms.
Under revision.
49. Hee-Kap Ahn, Eunjin Oh, Lena Schlipf, Fabian Stehn, Darren Strash.
On Romeo and Juliet Problems: Minimizing Distance-to-Sight.
Under revision (on invitation).
48. Eunjin Oh, Sang Won Bae, Hee-Kap Ahn.
Computing a Geodesic Two-Center of Points in a Simple Polygon.
Under revision.
47. Hee-Kap Ahn, Sang Won Bae, Jongmin Choi, Matias Korman, Wolfgang Mulzer, Eunjin Oh, Ji-Won Park, André van Renssen, Antoine Vigneron.
Faster Algorithms for Growing Prioritized Disks and Rectangles.
Under revision.
46. Eunjin Oh, Hee-Kap Ahn.
Voronoi Diagrams for a Moderate-Sized Point-Set in a Simple Polygon.
Under revision.
45. Eunjin Oh, Luis Barba, Hee-Kap Ahn.
The Geodesic Farthest-point Voronoi Diagram in a Simple Polygon.
Under revision.
44. Hee-Kap Ahn, Helmut Alt, Maïke Buchin, Eunjin Oh, Ludmila Scharf, Carola Wenk.
A Middle Curve Based on Discrete Fréchet Distance.
Accepted.
43. Eunjin Oh, Hee-Kap Ahn.
Assigning Weights to Minimize the Covering Radius in the Plane.
Accepted for publication in *Computational Geometry: Theory and Applications*.
42. Eunjin Oh, Hee-Kap Ahn.
Computing the Center Region and Its Variants.
Theoretical Computer Science, 2018.
41. Hee-Kap Ahn, Judit Abardia, Sang Won Bae, Otfried Cheong, Susanna Dann, Dongwoo Park, Chan-Su Shin.
The Minimum Convex Container of Two Convex Polytopes under Translations.
Computational Geometry: Theory and Applications, 77, pages 40–50, 2019. (on invitation, CCCG 2014)

40. Eunjin Oh, Jean-Lou De Carufel, Hee-Kap Ahn.
The geodesic 2-center problem in a simple polygon. [Free access.]
Computational Geometry: Theory and Applications 74, pages 21–37, 2018.
39. Sang Duk Yoon, Min-Gyu Kim, Wanbin Son, Hee-Kap Ahn.
Geometric Matching Algorithms for Two Realistic Terrains.
Theoretical Computer Science 715, pages 60–70, 2018.
38. Wanbin Son, Fabian Stehn, Christian Knauer, Hee-Kap Ahn.
Top- k Manhattan Spatial Skyline Queries.
Information Processing Letters 123, pages 27–35, 2017.
37. Sang Duk Yoon, Hee-Kap Ahn, Jessica Sherette.
Realistic Roofs without Local Minimum Edges over a Rectilinear Polygon.
Theoretical Computer Science 675, pages 15–26, 2017.
36. Hee-Kap Ahn, Luis Barba, Prosenjit Bose, Jean-Lou De Carufel, Matias Korman, Eunjin Oh.
A linear-time algorithm for the geodesic center of a simple polygon. (Full-text view-only version)
Discrete & Computational Geometry 56(4), pages 836–859, 2016. (on invitation, SoCG 2015)
35. Dongwoo Park, Sang Won Bae, Helmut Alt, Hee-Kap Ahn.
Bundling Three Convex Polygons to Minimize Area or Perimeter.
Computational Geometry: Theory and Applications 51(1), pages 1–14, 2016.
34. Wanbin Son, Sang Won Bae, Hee-Kap Ahn.
Group Nearest-Neighbor Queries in the L1 Plane.
Theoretical Computer Science 592, pages 39–48, 2015.
33. Sang-Sub Kim, Hee-Kap Ahn.
An Improved Data Stream Algorithm for Clustering.
Computational Geometry: Theory and Applications 48(9), pages 635–645, 2015.
32. Hee-Kap Ahn, Hyo-Sil Kim, Sang-Sub Kim, Wanbin Son.
Computing k centers over Streaming Data for Small k .
International Journal of Computational Geometry and Applications 24(02), pages 107–123, 2014.
31. Hee-Kap Ahn, Sang Won Bae, Otfried Cheong, Joachim Gudmundsson, Takeshi Tokuyama, Antoine Vigneron.
A Generalization of the Convex Kakeya Problem.
Algorithmica 70(2), pages 152–170, 2014. (on invitation, LATIN 2012)
30. Wanbin Son, Seung-won Hwang, Hee-Kap Ahn.
MSSQ: Manhattan Spatial Skyline Queries.
Information Systems 40, pages 67–83, 2014.
29. Hee-Kap Ahn, Siu-Wing Cheng, Hyuk Jun Kweon, Juyoung Yon.
Overlap of Convex Polytopes under Rigid Motion.
Computational Geometry: Theory and Applications 47(1), pages 15–24, 2014.
28. Hee-Kap Ahn, Sang Won Bae, Christian Knauer, Mira Lee, Chan-Su Shin, Antoine Vigneron.
Realistic Roofs over a Rectilinear Polygon.
Computational Geometry: Theory and Applications 46(9), pages 1042–1055, 2013.
27. Hee-Kap Ahn, Siu-Wing Cheng, Iris Reinbacher.
Maximum Overlap of Convex Polytopes under Translation.
Computational Geometry: Theory and Applications, a special issue on “Geometric Optimization”.
46(5), pages 552–565, 2013.

26. Hee-Kap Ahn, Sang-Sub Kim, Christian Knauer, Lena Schlipf, Chan-Su Shin, Antoine Vigneron. Covering and Piercing Disks with Two Centers. *Computational Geometry: Theory and Applications*, 46(3), pages 253–262, 2013.
25. Hee-Kap Ahn, Christian Knauer, Marc Scherfenberg, Lena Schlipf, Antoine Vigneron. Computing the Discrete Fréchet Distance with Imprecise Input. *International Journal of Computational Geometry and Applications*, 22(1), pages 27–44, 2012. (on invitation, ISAAC 2010)
24. Hee-Kap Ahn, Otfried Cheong. Aligning two convex figures to minimize area or perimeter. *Algorithmica*, 62(1–2), pages 464–479, 2012.
23. Hee-Kap Ahn, Otfried Cheong, Jiří Matoušek, Antoine Vigneron. Reachability by paths of bounded curvature in a convex polygon. *Computational Geometry: Theory and Applications*, 45(1–2), pages 21–32, 2012.
22. Hee-Kap Ahn, Sang Won Bae, Marc van Kreveld, Iris Reinbacher, Bettina Speckmann. Empty Pseudo-Triangles in Point Sets. *Discrete Applied Mathematics*, 159(18), pages 2205–2213, 2011.
21. Mu-Woong Lee, Wanbin Son, Hee-Kap Ahn, Seung-won Hwang. Spatial Skyline Queries: Exact and Approximation Algorithms. *GeoInformatica*, 15(4), pages 665–697, 2011. (on invitation, SSTD 2009 Best Paper)
20. Sang-Sub Kim, Sang Won Bae, Hee-Kap Ahn. Covering a Point Set by Two Disjoint Rectangles. *International Journal of Computational Geometry and Applications*, 21(3), pages 313–330, 2011. (on invitation, ISAAC 2008)
19. Hee-Kap Ahn, Sang Won Bae, Erik D. Demaine, Martin L. Demaine, Sang-Sub Kim, Mathias Korman, Iris Reinbacher, Wanbin Son. Covering Points by Disjoint Boxes with Outliers. *Computational Geometry: Theory and Applications*, 44(3), pages 178–190, 2011.
18. Hee-Kap Ahn, Yoshio Okamoto. Adaptive Algorithms for Planar Convex Hull Problems. *IEICE Transactions on Information and Systems* E94–D(2), pages 182–189, 2011.
17. Hee-Kap Ahn, Peter Brass, Christian Knauer, Hyeon-Suk Na, Chan-Su Shin. Covering a Simple Polygon by Monotone Directions. *Computational Geometry: Theory and Applications* 43(5), pages 514–523, 2010.
16. Hee-Kap Ahn, Mohammad Farshi, Christian Knauer, Michiel Smid, Yajun Wang. Dilation-Optimal Edge Deletion in Polygonal Cycles. *International Journal of Computational Geometry and Applications*, 20(1), pages 69–87, 2010. (on invitation, ISAAC 2007)
15. Sang Won Bae, Chunseok Lee, Hee-Kap Ahn, Sunghee Choi, Kyung-Yong Chwa. Computing Minimum-Area Rectilinear Convex Hull and L-Shape. *Computational Geometry: Theory and Applications*, 42(9), pages 903–912, 2009
14. Hee-Kap Ahn, Sang Won Bae, Siu-Wing Cheng, Kyung-Yong Chwa. Casting an Object with a Core. *Algorithmica* 54(1), pages 72–88, 2009.
13. Hee-Kap Ahn, Helmut Alt, Tetsuo Asano, Sang Won Bae, Peter Brass, Otfried Cheong, Christian Knauer, Hyeon-Suk Na, Chan-Su Shin, Alexander Wolff. Constructing Optimal Highways.

International Journal of Foundations of Computer Science 20(1), pages 3–23, 2009. (on invitation, CATS 2007)

12. Hee-Kap Ahn, Peter Brass, Hyeon-Suk Na, Chan-Su Shin.
On the Minimum Size of Systems of Building Blocks Expressing all Intervals, and Range-Restricted Queries.
Computational Geometry: Theory and Applications 42(3), pages 207–213, 2009.
11. Hee-Kap Ahn, Sang Won Bae, Otfried Cheong, Joachim Gudmundsson.
Aperture-Angle and Hausdorff-Approximation of Convex Figures.
Discrete & Computational Geometry 40(3), pages 414–429, 2008.
10. Hee-Kap Ahn, Peter Brass, Chan-Su Shin.
Maximum Overlap and Minimum Convex Hull of Two Convex Polyhedra under Translations.
Computational Geometry: Theory and Applications 40, pages 171–177, 2008.
9. Hee-Kap Ahn, Otfried Cheong, Chong-Dae Park, Chan-Su Shin, Antoine Vigneron.
Maximizing the Overlap of Two Planar Convex Sets under Rigid Motions.
Computational Geometry: Theory and Applications 37, pages 3–15, 2007. (on invitation, ACM SoCG 2005)
8. Hee-Kap Ahn, Siu-Wing Cheng, Otfried Cheong.
Casting with Skewed Ejection Direction.
Algorithmica 44(4), pages 325–342, 2006.
7. Hee-Kap Ahn, Peter Brass, Otfried Cheong, Hyeon-Suk Na, Chan-Su Shin, Antoine Vigneron.
Inscribing an Axially Symmetric Polygon and other Approximation Algorithms for Planar Convex Sets.
Computational Geometry: Theory and Applications 33(3), pages 152–164, 2006.
6. Hee-Kap Ahn, Siu-Wing Cheng, Otfried Cheong, Jack Snoeyink.
The Reflex-Free Hull.
International Journal of Computational Geometry and Applications 14(6), pages 453–474, 2004.
5. Hee-Kap Ahn, Siu-Wing Cheng, Otfried Cheong, Mordecai Golin, René van Oostrum.
Competitive Facility Location: The Voronoi Game.
Theoretical Computer Science 310(1-3), pages 457–467, 2004.
4. Hee-Kap Ahn, Otfried Cheong, René van Oostrum.
Casting a Polyhedron with Directional Uncertainty.
Computational Geometry: Theory and Applications 26(2), pages 129–141, 2003.
3. Hee-Kap Ahn, Otfried Cheong, Chan-Su Shin.
Building Bridges between Convex Regions.
Computational Geometry: Theory and Applications 25(1/2), pages 161–170, 2003.
2. Hee-Kap Ahn, Mark de Berg, Prosenjit Bose, Siu-Wing Cheng, Dan Halperin, Jiří Matoušek, Otfried Schwarzkopf.
Separating an Object from its Cast.
Computer-Aided Design (CAD) 34(8), pages 547–559, 2002.
1. Hee-Kap Ahn, Prosenjit Bose, Jurek Czyzowicz, Nicolas Hanusse, Evangelos Kranakis, Pat Morin.
Flipping your Lid.
Geombinatorics X(2), pages 57–63, 2000. at Utrecht university.

Guest-Edited Journal Issues and Books

3. Hee-Kap Ahn, Chan-Su Shin.
Guest Editor's Foreword of the special Issue for the 25th International Symposium on Algorithms and Computation (ISAAC 2014).
Algorithmica 76(4), 2016.
2. Hee-Kap Ahn, Chan-Su Shin.
Algorithms and Computation - 25th International Symposium, ISAAC 2014, Jeonju, Korea, December 15-17, 2014
Proceedings. Lecture Notes in Computer Science 8889, Springer 2014, ISBN 978-3-319-13074-3.
1. Hee-Kap Ahn, Antoine Vigneron.
Guest Editors' Foreword of the special issue for the 24th International Symposium on Algorithms and Computation (ISAAC 2013).
International Journal of Computational Geometry and Applications 24(4), pages 259–260, 2014.

Refereed International Conference Proceedings

68. Yoonho Hwang, Sehoon Kim, Mooyeol Baek, Bohyung Han, Hee-Kap Ahn.
Product Quantized Translation for Fast Nearest Neighbor Search.
In Proc. *32nd AAAI Conference on Artificial Intelligence (AAAI-18)*, pages 3295–3301, 2018.
67. Eunjin Oh, Hee-Kap Ahn.
Approximate Range Queries for Clustering.
In Proc. *34th International Symposium on Computational Geometry (SoCG 2018)*, pages 62:1–62:14, 2018.
66. Eunjin Oh, Hee-Kap Ahn.
Point Location in Dynamic Planar Subdivisions.
In Proc. *34th International Symposium on Computational Geometry (SoCG 2018)*, pages 63:1–63:14, 2018.
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