

List of Publications

Refereed Journal Papers

1. D. Avis, C. De Simone, and B. Reed, "On the Fractional Chromatic Index of a Graph and its Complement," *Operations Research Letters*, 33, pp. 385-388 (2005).
2. D. Avis and B. Kaluzny, "Solving Inequalities and Proving Farkas' Lemma Made Easy," *AMS Mathematical Monthly*, 111, pp. 152-157 (2004).
3. D. Avis and A. Deza, "Un des "Problèmes Plaisans et Délectables" de Claude Berge," *Les cahiers du GERAD*, G-2003-07 (January, 2003). *Discrete Mathematics* (to appear).
4. D. Avis and J. Umemoto, "Stronger Linear Programming Relaxations of Max-Cut," *Mathematical Programming*, B 97, pp. 451-469 (2003).
5. D. Avis, C. De Simone, and P. Nobile, "On the Chromatic Polynomial of a Graph," *Mathematical Programming B*, B 92, pp. 439-452 (2002).
6. D. Avis, K. Hosono, and M. Urabe, "On the Existence of a Point Set with a Specified Number of Interior Points," *Discrete Mathematics*, 241, pp. 33-40 (2001).
7. D. Avis and A. Deza, "On the Binary Solitaire Cone," *Discrete and Applied Mathematics*, 115, pp. 3-14 (2001).
8. D. Avis and A. Deza, "On the Solitaire Cone and its Relationship to Multicommodity Flows," *Mathematical Programming*, 90-1, pp. 27-57 (2001).
9. D. MacDonald, N. Kabani, D. Avis, and A.C. Evans, "Automated 3-D Extraction of Inner and Outer Surfaces of Cerebral Cortex from MRI," *Neuroimage*, 12, pp. 340-356 (2000).
10. D. Avis, A. Deza, and S. Onn, "A Combinatorial Approach to the Solitaire Game," *IEICE Trans. on Fund. of Electronics, Communications and Computer Sciences*, E83-A, pp. 656-661 (2000).
11. D. Avis and L. Devroye, "Estimating the Number of Vertices of a Polyhedron," *Information Processing Letters*, 73, pp. 137-143 (2000).
12. D. Avis, "Computational Experience with the Reverse Search Vertex Enumeration Algorithm," *Optimization Methods and Software*, 10, pp. 107-124 (1998).
13. D. Avis, B. Beresford-Smith, L. Devroye, H. ElGindy, E. Guevermont, F. Hurtado, and B. Zhu, "Unoriented Theta-Maxima in the Plane: Complexity and Algorithms," *SIAM J. Comput.*, 28, pp. 278-296 (1998).
14. D. Avis, D. Bremner, and R. Seidel, "How Good are Convex Hull Algorithms?," *Computational Geometry: Theory and Applications*, 7, pp. 265-301 (1997).
15. D. Avis, "Generating Rooted Triangulations Without Repetitions," *Algorithmica*, 16, pp. 618-632 (1996).
16. D. Avis and K. Fukuda, "Reverse Search for Enumeration," *Discrete Applied Math*, 6, pp. 21-46 (1996).
17. D. Avis and M. Houle, "Computational Aspects of Helly's Theorem and its Relatives," *International Journal of Computational Geometry & Applications*, 5, pp. 357-367 (1995).

18. G. Ceder, G.D. Garbulsky, D. Avis, and K. Fukuda, "Ground States of a Ternary Lattice Model with Nearest and Next-Nearest Neighbor Interactions," *Physical Review B*, 49, pp. 1-7 (1994).
19. D. Avis and H. Maehara, "Metric Extensions and the L1-Hierarchy," *Discrete Mathematics*, 131, pp. 17-28 (1994).
20. D. Avis and V. P. Grishukhin, "A Bound on the k-gonality of Facets of the Hypermetric Cone and Related Complexity Problems," *Computational Geometry: Theory and Applications*, 2, pp. 241-254 (1993).
21. D. Avis, "The m-Core Properly Contains the m-Divisible Points in Space," *Pattern Recognition Letters*, 14, pp. 703-705 (1993).
22. D. Avis and K. Fukuda, "A Pivoting Algorithm for Convex Hulls and Vertex Enumeration of Arrangements and Polyhedra," *Discrete and Computational Geometry*, 8, pp. 295-313 (1992).
23. D. Avis and K. Fukuda, "A Basis Enumeration Algorithm for Linear Systems with Geometric Applications," *Applied Math. Letters*, 4, pp. 39-42 (1991).
24. D. Avis and M. Deza, "The Cut Cone, L1-Embedability, Complexity and Multi-commodity Flows," *Networks*, 21, pp. 595-617 (1991).
25. D. Avis, P. Erdos, and J. Pach, "Distinct Distances Determined by a Subset of Points in Space," *Computational Geometry: Theory and Applications*, 1, pp. 1-12 (1991).
26. D. Avis and H. Imai, "Locating A Robot With Angle and Distance Measurements," *J. Symbolic Computation*, 10, pp. 311-327 (1990).
27. D. Avis and M. Doskas, "Algorithms for High Dimensional Stabbing Problems," *Discrete Applied Math.*, 27, pp. 39-48 (1990).
28. D. Avis, J-M. Robert, and R. Wenger, "Lower Bounds for Line Stabbing," *Information Processing Letters*, 33, pp. 59-62 (1989).
29. D. Avis and Mutt, "All the Facets of The Six Point Hamming Cone," *European Journal of Combinatorics*, 10, pp. 309-312 (1989).
30. A. Somani, V. K. Agarwal, and D. Avis, "On the Complexity of Single Fault Set Diagnosability and Diagnosis Problems," *IEEE Trans. on Computers*, 38, pp. 195-201 (1989).
31. D. Avis, P. Erdos, and J. Pach, "Repeated Distances in Space," *Graphs and Combinatorics*, 4, pp. 207-217 (1988).
32. D. Avis and R. Wenger, "Polyhedral Line Transversals in Space," *Discrete and Computational Geometry*, 3, pp. 257-265 (1988).
33. D. Avis, B. Davis, and J. M. Steele, "Probabilistic Analysis of a Greedy Heuristic for Euclidean Matching," *Probability In the Engineering and Information Sciences*, 2, pp. 143-156 (1988).
34. D. Avis and C. W. Lai, "The Probabilistic Analysis of a Heuristic for the Assignment Problem," *SIAM Journal on Computing*, 17, pp. 732-741 (1988).
35. D. Avis, B. K. Bhattacharya, and H. Imai, "Computing the Volume of the Union of Spheres," *The Visual Computer*, 3, pp. 323-328 (1988).

36. D. Avis and H. ElGindy, "Triangulating Point Sets in Space," *Discrete and Computational Geometry*, 2, pp. 99-111 (1987).
37. A. Somani, V. K. Agarwal, and D. Avis, "A Generalized Theory for System Level Diagnosis," *IEEE Trans. on Computers*, C-36, pp. 538-547 (1987).
38. D. Avis, T. Gum, and G. Toussaint, "Visibility Between Two Edges of a Simple Polygon," *The Visual Computer*, 2, pp. 342-357 (1986).
39. D. Avis, "Diameter Partitioning," *Discrete and Computational Geometry*, 1, pp. 265-276 (1986).
40. J. Akiyama, K. Ando, and D. Avis, "Eccentric Graphs," *Discrete Mathematics*, 56, pp. 1-6 (1985).
41. D. Avis and J. Horton, "Remarks on The Sphere of Influence Graph" in *Discrete Geometry and Convexity*, ed. Goodman, Lutwak, Malkevitch, and Pollack, 440, pp. 323-327, N.Y. Academy of Sciences (1985).
42. D. Avis and L. Devroye, "An Analysis of a Decomposition Heuristic for the Assignment Problem," *Operations Research Letters*, 3, pp. 279-283 (1985).
43. D. Avis, "Non-Partitionable Point Sets," *Information Proc. Letters*, 19, pp. 125-129 (1984).
44. D. Avis, "The Number of Furthest Neighbour Pairs of a Finite Planar Set," *American Math Monthly*, 91, pp. 417-420 (1984).
45. J. Akiyama, K. Ando, and D. Avis, "Miscellaneous Properties of Equi-Eccentric Graphs," *Annals of Discrete Mathematics*, 20, pp. 13-23 (1983).
46. D. Avis, "A Survey of Heuristics for the Weighted Matching Problem," *Networks*, 13, pp. 475-493 (1983).
47. D. Avis and H. ElGindy, "A Combinatorial Approach to Polygon Similarity," *IEEE Trans. on Information Theory*, IT-29, pp. 148-150 (1983).
48. H. ElGindy, D. Avis, and G. T. Toussaint, "Applications of a Two-dimensional Hidden Line Algorithm to Other Geometric Problems," *Computing*, 31, pp. 191-202 (1983).
49. D. Avis, G. T. Toussaint, and B. K. Bhattacharya, "On the Multimodality of Distances in a Convex Polygon," *Computers and Maths. with Applications*, 8, pp. 153-156 (1982).
50. D. Avis, "On the Complexity of Finding the Convex Hull of a Set Points," *Discrete Applied Math*, 4, pp. 81-86 (1982).
51. G.T. Toussaint and D. Avis, "On a Convex Hull Algorithm for Polygons and its Application to Triangulation Problems," *Pattern Recognition*, 15, pp. 23-29 (1982).
52. J. Akiyama, D. Avis, V. Chvatal, and H. Era, "Balancing Signed Graphs," *Discrete Applied Maths.*, 3, pp. 227-233 (1981).
53. D. Avis and G. T. Toussaint, "An Efficient Algorithm for Decomposing a Polygon into Star-shaped Components," *Pattern Recognition*, 13, pp. 395-398 (1981).
54. D. Avis, "Hypermetric Spaces and the Hamming Cone," *Canadian Journal of Mathematics*, 33, pp. 795-802 (1981).

55. D. Avis and G. T. Toussaint, "An Optimal Algorithm for Determining the Visibility of a Polygon from an Edge," *IEEE Trans. on Computers*, C-30, pp. 910-914 (1981).
56. D. Avis, "Worst Case Bounds for the Euclidean Matching Problem," *Computers and Maths with Applications*, 7, pp. 251-257 (1981).
57. D. Avis and M. Newborn, "On Pop-stacks in Series," *Utilitas Mathematica*, 19, pp. 129-140 (1981).
58. H. ElGindy and D. Avis, "A Linear Algorithm for Computing the Visibility of a Polygon from a Point," *J. of Algorithms*, 2, pp. 186-197 (1981).
59. J. Akiyama, D. Avis, and H. Era, "On a [1,2] factor of a Graph," *TRU Mathematics*, 16, pp. 97-102 (1980).
60. D. Avis, "Comments on a Lower Bound for Convex Hull Determination," *Information Proc. Letters*, 11, p. 126 (1980).
61. D. Avis, "A Note on Some Computationally Difficult Set Covering Problems," *Math. Programming*, 18, pp. 138-145 (1980).
62. D. Avis, "On the Extreme Rays of the Metric Cone," *Canadian J. of Maths.*, 32, pp. 126-144 (1980).
63. D. Avis, "Extremal Metrics Induced by Graphs," *Annals of Discrete Maths.*, 8, pp. 217-220 (1980).
64. D. Avis, "On Minimal 5-Chromatic Triangle Free Graphs," *J. of Graph Theory*, 3, pp. 397-400 (1979).
65. D. McCallum and D. Avis, "On the Complexity of Finding the Convex Hull of a Simple Polygon," *Information Proc. Letters*, 9, pp. 201-206 (1979).
66. D. Avis and V. Chvatal, "Notes on Bland's Pivoting Rule," *Math. Programming Study*, 8, pp. 24-34 (1978).
67. D. Avis, "Computing the Waiting Time in GI/Ek/c Queueing Systems," *Studies in Management Science*, 7, pp. 215-232 (1977).

Book

1. D. Avis, A. Hertz, and O. Marcotte (editors), *Graph Theory and Combinatorial Optimization*, Springer (2005). 264 pages.
2. D. Avis, H. Imai, and S. Matsunaga, *Keisankikagaku Risankagaku (Computational and Discrete Geometry)*, Asakura, Tokyo (September 1994). In Japanese, 150 pages.
3. F. Hillier, O. Yu, D. Avis, L. Fosset, F. Lo, and M. Reiman, *Queueing Tables and Graphs*, Elsevier North-Holland (1981).

Book Chapters

1. D. Avis, "irs: A Revised Implementation of the Reverse Search Vertex Enumeration Algorithm" in *Polytopes - Combinatorics and Computation*, ed. G. Kalai and G.M. Ziegler, pp. 177-198, Birkhauser-Verlag (2000).

2. D. Avis, "A C Implementation of the Reverse Search Vertex Enumeration Algorithm" in *RIMS Kokyuroku* 872, ed. H. Imai, Kyoto University (May 1994). <http://cgm.cs.mcgill.ca/~avis/doc/avis/Av94a.ps>.
3. D. Avis and D. Rappaport, "Computing Monotone Simple Circuits in the Plane" in *Computational Morphology*, ed. G. Toussaint, pp. 13-23, North-Holland (1988).
4. D. Avis, "Space Partitioning and its Application to Generalized Retrieval Problems" in *Foundations of Data Organization*, ed. S.Ghosh, Y. Kambayashi, K. Tanaka, pp. 237-249, Plenum Press (1987).
5. D. Avis, H. ElGindy, and R. Seidel, "A Simple On-line Algorithm for Planar Convex Hulls" in *Computational Geometry*, ed. G. T. Toussaint, pp. 23-41, Springer Verlag (1985).
6. D. Avis and B. K. Bhattacharya, "Algorithms for Computing d-dimensional Voronoi Diagrams and Their Duals" in *Advances in Computing Research 1, Computational Geometry*, ed. F.P. Preparata, pp. 159-180, JAI Press (1983).

Conference Proceedings

1. D. Avis and T. Ito, "New Classes of Facets of the Cut Polytope and Tightness of the $I_{mm}22$ Bell Inequalities" in *Proceedings of the 4th Japan-Hungarian Symposium on Discrete Mathematics and its Applications*, Budapest (June 2005). <http://arxiv.org/abs/math.CO/0505143>.
2. T. Ito, Y. Sasaki, H. Imai, and D. Avis, "Families of Tight Bell Inequalities Derived from Classes of Facets of Cut Polytopes" in *Proceedings of ERATO Conference on Quantum Information Science (EQIS'04)*, pp. 78-9 (September 2004).
3. D. Avis, "On the Complexity of Testing Hypermetric, Negative Type, k-gonal and Gap Inequalities," *Lecture Notes in Computer Science*, LNCS 2866, pp. 51-59 (2003). Japanese Conference on Discrete and Computational Geometry, JCDCG '02.
4. D. Avis, K. Fukuda, and S. Picozzi, "On Canonical Representations of Convex Polyhedra," *ICMS 2002*, pp. 350-360, World Scientific (2002).
5. D. Avis, C. De Simone, and P. Nobile, "Two Conjectures on the Chromatic Polynomial" in *Lecture Notes in Computer Science*, 1776, pp. 154-162, Springer-Verlag (2000).
6. D. Avis, K. Hosono, and M. Urabe, "On the Existence of a Point Set with 4 or 5 Interior Points" in *Lecture Notes in Computer Science*, ed. J. Akiyama and M. Kano, 1763, pp. 57-64, Springer-Verlag (2000).
7. D. Avis, "Living with lrs " in *Lecture Notes in Computer Science*, ed. J. Akiyama and M. Kano, 1763, pp. 47-56, Springer-Verlag (2000).
8. D. Avis and A. Deza, "On the Boolean Solitaire Cone" in *Proc. of the 1st Japanese-Hungarian Symposium on Discrete Mathematics and its Applications*, pp. 115-122, Kyoto (1999).
9. D. MacDonald, D. Avis, and A.C. Evans, "Proximity Constraints in Deformable Models for Cortical Surface Identification" in *Lecture Notes in Computer Science*,

- 1496, pp. 650-659, Springer-Verlag, MICCAI'98 (1998).
10. T. Ono, Y. Kyoda, T. Masada, K. Hayase, T. Shibuya, M. Inaba, H. Imai, K. Imai, and D. Avis, "A Package for Triangulations (Video)" in *Proc. 12th Annual ACM Symp. on Comput. Geom.*, ACM Press, Philadelphia, PA (1996).
 11. D. Avis, P. Bose, T. Shermer, J. Snoeyink, G. Toussaint, and B. Zhu, "On the Sectional Area of Convex Polytopes," *Proc. 12th ACM Symposium on Computational Geometry*, pp. C11-12, Philadelphia (1996).
 12. D. Avis and D. Bremner, "How Good are Convex Hull Algorithms?" in *Proc. 11th Annual ACM Symp. on Comput. Geom.*, pp. 20-28 (June 1995).
 13. D. MacDonald, D. Avis, and A. Evans, "Multiple Surface Identification and Matching in Magnetic Resonance Images," *Visualization in Biomedical Computing*, SPIE '94 (October 1994).
 14. D. Avis and K. Fukuda, "A Pivoting Algorithm for Convex Hulls and Vertex Enumeration of Arrangements and Polyhedra," *Proceedings of the 7th ACM Symposium on Computational Geometry*, pp. 98-104, ACM Press (June 1991).
 15. D. Avis, "On the Complexity of Isometric Embedding in the Hypercube," *Proc. SIGAL Int. Symp. on Algorithms*, pp. 348-357, Springer-Verlag, Tokyo (1990).
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 18. A. Somani, V. K. Agarwal, and D. Avis, "Single Fault Diagnosability Concept: System Level Diagnosis Applied to Large Scale Multiprocessor Systems," *Proc. 1986 Symp. on Circuits and Systems*, pp. 634-638, San Jose, CA (May 1986).
 19. A. Somani, D. Avis, and V. K. Agarwal, "On the Complexity of Diagnosability and Diagnosis Problems in System Level Diagnosis," *Proc. 1986 Symp. on Fault Tolerant Computing*, Vienna (June 1986).
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 21. D. Avis and D. Rappaport, "Computing the Largest Empty Convex Subset of a Set of Points," *Proceedings of the Symposium on Computational Geometry*, pp. 161-167, ACM, Baltimore, MD (1985).
 22. J. Akiyama and D. Avis, "Cube Factors" in *Proc. 1st S.E. Asian Graph Theory Colloquium*, ed. A. Dold and B. Eckman, 1073, pp. 93-99, Springer Verlag, Lecture Notes in Mathematics (1983).
 23. D. Avis, "Lower Bounds for Geometric Problems," *18th Allerton Conference*, pp. 35-40, Urbana, IL (1980).
 24. D. Avis, "Two Greedy Heuristics for the Weighted Matching Problem," *Proc. 9th S.E. Conf. on Comb., Graph Theory, and Computing*, pp. 65-76, Congressus Numerantium XXI (1978).

Other Publications

1. D. Avis, J. Hasegawa, Y. Kikuchi, and Y. Sasaki, "A Quantum Protocol to Win the Graph Colouring Game on all Hadamard Graphs," Preprint (August 2005). 5 pages.
2. T. Ito, H. Imai, and D. Avis, "Bell Inequalities Stronger than the CHSH Inequality for 3 by 3 Isotropic States," Preprint (August 23, 2005). 12 pages.
3. D. Avis, H. Imai, T. Ito, and Y. Sasaki, "Two-party Bell Inequalities Derived from Combinatorics via Triangular Elimination," Preprint (August 23, 2005). 20 pages.
4. D. Avis and B. Kaluzny, "Computing Disjoint Paths on Polytopes," *Les cahiers du GERAD*, G-2005-26 (March 2005).
5. D. Avis, B. Kaluzny, and D. Titley-Peloquin, "Visualizing and Constructing Cycles in the Simplex Method," *Les cahiers du GERAD*, G-2005-33 (March 2005).
6. Y. Sasaki, T. Ito, H. Imai, and D. Avis, "Bell Inequalities Derived from Combinatorics" in *10th Quantum Information Technology Symposium (QIT10)*, Technical Report QIT2004-12 (December 2004). (In Japanese).
7. D. Avis, H. Imai, T. Ito, and Y. Sasaki, "Test of Relevance Relation between Bell Inequalities using Nonlinear and Semidefinite Programming" in *11th Quantum Information Technology Symposium (QIT11)*, Technical Report QIT2004-57 (May 2004). (In Japanese).
8. D. Avis, H. Imai, T. Ito, and Y. Sasaki, "Deriving Tight Bell Inequalities for 2 Parties with Many 2-valued Observables from Facets of Cut Polytopes," Preprint (April 1, 2004). <http://arxiv.org/abs/quant-ph/0404014>.
9. D. Avis and B. Kaluzny, "Solving Inequalities and Proving Farkas' Lemma Made Easy," *Les cahiers du GERAD*, G-2002-50 (September, 2002).
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15. D. Avis, "On the Hamming Cone," Technical Report 77-5, Dept. of Operations Research, Stanford University (1977).