

Curriculum Vitæ: Chee K. Yap

Personal

Born in Singapore, September 27, 1952; U.S. citizen; married with two children.

Education

Graduate School: Yale University, 1975–79, Ph.D. (Computer Science). Thesis: *Three Studies on Computational Problems*. Advisor: Professor Richard J. Lipton.

College: M.I.T., 1972–75, S.B. (Computer Science) and S.B. (Mathematics). Thesis: *On the Selection Problem*. Advisor: Professor Vaughn R. Pratt.

High School: Boys' Wing, Royal Military College, Malaysia 1968–71.

Honors

Distinguished Lectures:

— “Theory of Real Approximation and Exact Geometric Computation”. *Distinguished Lecture Series*, Computer Science Department, Drexel University, April 19, 2007.

— “Advances in Algorithmic Robotics”, *NSF/LaSER Distinguished Lecturer Series on Robotics and AI*, Louisiana State University, May 9, 1991.

KIAS Scholar (2006–present), Korea Institute of Advanced Study.

ACM Recognition of Service Award, General Chair of the 9th ACM Symposium on Computational Geometry (1993).

Lester R. Ford Award (1990) (*Mathematical Association of America*) for paper “*Mountain climbing, ladder moving, and the ring-width of a polygon*” with E. Goodman and J. Pach, **Amer. Math. Monthly** **96**(1989)494–510.

Fulbright Scholar Award (Morocco, 1988).

ACM Recognition of Service Award, Program Committee Chair of the 3rd ACM Symposium on Computational Geometry (1987).

George Forsythe Award (1975) second prize (ACM student paper competition) for paper “*New upper bounds on the selection problem*”, **Comm. ACM**, **19:9**(1976)501–508.

Phi Beta Kappa, M.I.T. (1975). (Academic Honor Society)

Eta Kappa Nu, M.I.T. (1975). (Electrical Eng. and Computer Science Honor Society)

Director of Studies Prize (1971), top academic award, Boys' Wing, Royal Military College, Malaysia.

Research Funding

[Continuous NSF Funding as P.I. from 1984-present]

1. Principal Investigator, *Complete Adaptive Algorithms for Curves and Surfaces, and their Complexity*, National Science Foundation, Grant #CCF-0728977, \$205,869, 9/1/2007–8/31/2009 (including travel supplement).

2. Associated Team Leader, *International Research Experience for US Students at INRIA*, P.I. Victor Vianu, UCSD. National Science Foundation, Grant #NSF-04-036 \$150,000, 06/01/06–5/31/2009. (NYU is one of 14 Associated Teams, each with a corresponding partner in INRIA. Each year, up to 3 graduate students from each team is sent to INRIA for 2-3 months.)
3. Principal Investigator, *A Theory of Real Approximations, with Applications*, National Science Foundation, Grant #CCF-0430836, \$240,000, 9/1/2004–8/31/2007.
4. Principal Investigator, *A New Computational Paradigm: Robustness as a Resource*, (co-PI, Marsha Berger), National Science Foundation, Grant #CCR-0082056, \$519,837, 9/1/2000–8/31/2004 (including \$30,000 for postdoc) This grant is in the Information Technology Research (ITR) initiative.
5. Principal Investigator, *Algorithmic Development of Visualization under Foveated Geometries*. National Science Foundation, Grant #CCR-9619846, \$184,788, 3/1/97–2/28/99 (with 2 amendments).
6. Project Coordinator, *Exact Computational Geometry and Metrology*. Collaborator, Professor K. Mehlhorn, Max-Planck Institute of Computer Science, Saarbruecken, Germany. NATO Collaborative Research Grants Programme, Grant #CRG-950367, BF 180,000, 6/1/95–6/1/97.
7. Principal Investigator, *Exact Geometric Computation*, National Science Foundation, Grant #CCR-9402464, \$172,999, 8/1/94–7/31/96.
8. Principal Investigator, *Manufacturing and Computational Geometry Workshop*, National Science Foundation, Grant #CCR-9400502, \$21,802, 1/1/94–12/31/94.
9. Principal Investigator (with Bud Mishra), *Computational Algebraic Geometry*, National Science Foundation, Grant #CCR-9002819 (amendment No. 1: #CCR-9146469), \$270,404m 8/15/90 – 1/31/94. This includes a supplement of \$21,840, #CCR-9347117, April 1993.
10. Principal Investigator, *Motion Planning Problems in Robotics: Algorithmic Issues*, National Science Foundation Grant DCR-84-01898, Supplemental \$83,306, 12/15/89 – 12/31/91.
11. Principal Investigator, *Third ACM Symposium on Computational Geometry*, National Science Foundation, Grant #CCR-8711843, \$3000, 1987.
12. Principal Investigator (with Bud Mishra), *Computational Algebraic Geometry*, National Science Foundation, Grant #CCR-8703458, \$204,388, 7/1/87–6/30/89.
13. Co-Investigator (with O. Widlund, Z. Kedem, D. Lowe, L. Wittie, M. Berger), National Science Foundation, equipment grant DCR-85-4821, \$139,776, 1985–86.
14. Co-Investigator (P.I. of Jack Schwartz and Olof Widlund), Coordinated Experimental Computer Sciences Grant, National Science Foundation, \$4.5M, 1984–89.
15. Principal Investigator (with Richard Cole), *Techniques for Geometric Retrieval and Related Problems in Computational Geometry*, National Science Foundation Grant DCR-84-01633, \$185,000, 6/1/84 – 5/31/87.
16. Principal Investigator (with Colm Ó'Dúnlaing), *Motion Planning Problems in Robotics: Algorithmic Issues*, National Science Foundation Grant DCR-84-01898, \$370,054, 6/1/84 – 11/30/89.
17. Principal Investigator, *New Paradigms for Computational Complexity and Related Topics*, National Science Foundation Grant No. MCS 80-05469, \$26,933, 7/1/80 – 12/30/82.

Work Experience

Professor of Computer Science, Courant Institute, New York University, 1989–present.

Associate Professor of Computer Science, Courant Institute, New York University, 1986–89.

Assistant Professor of Computer Science, Courant Institute, New York University, 1981–1986.

Assistant Professor of Computer Science, University of Southern California, 1979–1981.

KIAS Scholar (Korea Institute of Advanced Study) (2006–present)

Summers, Sabbaticals and Leaves-of-Absence: Korea Institute of Advanced Study (KIAS) (Jun-Aug 2005); Max-Planck Institute of Computer Science (Jul-Aug 2004); Seoul National University (Sep 2003-Jun 2004); Max-Planck Institute of Computer Science (Jun-Jul 2003); National University of Singapore (Nov 1995-Jun 1996); Supercomputing Research Center, Bowie, Maryland (summer 1993); Free University Berlin (Aug-Oct 1988, Apr 1989-Feb 1990); University of British Columbia (Nov 1988-Mar 1989); Johannes Kepler Universitaet Linz (May-Jul 1988); Sultan Mohammed V University Rabat (Fulbright Fellowship, Apr 1988); University of Utrecht (Jan-Mar 1988); University of Saarland (Sep-Dec 1987); Oxford University (Jul-Aug 1987); DEC Systems Research Laboratory, Palo Alto (summer 1986), AT&T Bell Laboratories, Murray Hill (summer 1985), IBM Thomas J. Watson Research Center (summers 1985), IBM Thomas J. Watson Research Center (summer intern 1979, 1978).

College and Graduate School: Research Assistant, University of California, Berkeley, 1978–1979; Research and Teaching Assistant, Yale University, 1975–78; Summer position at IBM Thomas J. Watson Research Center, 1977 and 1978; Undergraduate research, MIT Project MAC (now Laboratory for Computer Science), 1973–75.

Editorial Capacities

1. Editor, *SIAM Journal of Computing*, 1985–2002.
2. Associate Editor, *Journal of Computer and System Sciences*, 1986–present.
3. Editor, *Journal of Symbolic Computation*, 1988–2004.
4. Editor, *Computational Geometry: Theory and Applications*, 1990–2006.
5. Editor, *International Journal of Computational Geometry and Applications*, 1990–2008.
6. Editor, *Algorithmica*, 1992–2007.
7. Editor, *Mathematics in Computer Science*, 2006–present.
8. Associate Editor, *LNCS Transactions on Computational Science*, (LNCS Journal Series), 2006–present.
9. Advisory Board, *International Journal of Computational Geometry and Applications*, 2008–present.
10. Guest editorships:
 - *Algorithmica*, vol.2, no.4, special issue on Robotics, 1987.
 - *J. of Discrete and Comp. Geo.*, vol.3, no.3, special issue on Computational Geometry, 1988.
 - *Algorithmica*, vol.4, special issue on Computational Geometry, 1989.
 - *J. Computer and System Science*, vol.39 special issue in Computational Geometry, 1989.
 - *J. Computer and System Science*, vol.52, No.1, 1996 (co-editor with Mike Goodrich). Special issue of papers from FOCS 1993.

- *Computational Geometry: Theory and Applications*, vol.33, nos.1-2, 2006 (co-editor with Sylvain Pion). Special issue on Robust Geometric Algorithms and their Implementation, 2004.
- *Mathematics in Computer Science* (Inaugural Issue), 2007 (co-editor with Hoon Hong). Special focus on *Algorithms at interface of continuous and discrete computation: Complexity and Analysis*.

Selected Recent Professional Activities

Invited Talk: TBA, *Special Session on Computational Algebra*, 1st PRIMA Congress, Pacific Rim Mathematical Association, University of New South Wales, Sydney, Australia. July 6-10, 2009.

Invited Talk: TBA, *Festschrift on Occasion of Wu Wen-Tsun's 90th Birthday*, Chinese Academy of Sciences, Beijing, China. May 2009.

Invited Talk: "Foundations of Exact Rounding", *Workshop on Algorithms and Computation* (WALCOM), Indian Statistical Institute, Kolkata, Feb 18-20, 2009. (One of four invited talks.)

Program Committee: *6th Annual Conference on Theory and Applications of Models of Computation* (TAMC) Changsha, China. May 18-22, 2009.

Program Committee: *19th International Workshop on Combinatorial Algorithms*. IWOCA2008, Nagoya, Japan. Sep 13-15, 2008.

Inaugural Issue Guest Editor (with Hoon Hong): *Mathematics in Computer Science* (MCS) from Birkhauser, 2007. Special focus on Algorithms and Complexity of Continuous Computation.

Invited Talk: "Subdivision Algorithms and Integral Analysis", *2nd Int'l Conf. on Mathematical Aspects of Computer and Information Sciences* (MACIS 2007), Paris, France, Dec 5-7, 2007. (One of three invited talks)

Invited Talk: "Complete Adaptive Algorithms for Curves and their Analysis", *ACS workshop on Robust Shape Operations*, INRIA Sophia-Antipolis, Sep 26-28, 2007. (One of two invited talks)

Distinguished Lecture: "Theory of Real Approximation and Exact Geometric Computation", Department of Mathematics, Drexel University, April 19, 2007.

Program Committee: *2007 Int'l Conf. on Computational Sci. and its Applic.* (ICCSA), Kuala Lumpur, Malaysia, Aug 26-30, 2007.

Organizer (with H.Hong and H.Park): *Workshop on the Zero Problem: Theory and Applications*, KIAS, Korea, Jul 19-21, 2007.

Invited Talk: "Complexity of Real Approximation: Brent Revisited", *Computing by the Numbers: Algorithms, Precision, and Complexity*, (Workshop in Honor of Brent's 60th Birthday), July 20-21, 2006. Weierstrass Institute for Applied Analysis and Stochastics (WIAS), Berlin.

Summer School Lecturer: "Robust Geometric Computation", KAIST-JAIST Summer School in Algorithms, Daejeon, S.Korea, Aug 8-12, 2005.

Advisory Board: *1st Int'l. Symp. on Voronoi Diagrams in Science and Engineering*, University of Tokyo, Japan in Sep 13-15, 2004.

Keynote speaker: "Robust Geometric Computation: 10 year Perspective", *Korean Computer Graphics Biannual Meeting*, Seoul National University, South Korea, Nov 22, 2003.

Keynote speaker: "On Guaranteed Accuracy Computation", *2003 Intl. Conf. on Computational Sci. and Applic.* (ICCSA), Montreal, Canada, May 18-21, 2003.

Program Committee: *5th Real Numbers and Computers Conference*, Lyon, France Sep 3-5, 2003.

Keynote speaker: "On Guaranteed Accuracy Computation", National Theoretical Computer Science Conference of China, Changsha, Hunan, China. Oct 13-17, 2002.

Professional Societies

Association for Computing Machinery (ACM), Society for Industrial and Applied Mathematics (SIAM), Institute for Electrical and Electronics Engineers (IEEE).

Graduate Students and Postdoctoral Associates

The initial position after graduation is noted. [*=Current position, if known]

Jyun-Sheng (Jason) Chang, *Polygon Optimization Problems* (PhD Thesis), Aug 1986.
Assistant Professor, National Tsing Hua University, Taipei, TAIWAN. [*Professor, National Tsing Hua University]

Jian-er Chen, *Circuit Complexity and Parallel Computation* (PhD Thesis), Aug 1987.
Courant Institute's *Janet Fabri Dissertation Award*.
Assistant Professor of Computer Science, Texas A&M. [*Professor of Computer Science at Texas A&M]

James L. Cox, *Online Motion Planning* (PhD Thesis), Jan 1989.
Assistant Professor of Computer Science, Brooklyn College, CUNY, New York. [*Associate Professor, Brooklyn College]

Thomas W. Dubé, *Quantitative Analysis of Problems in Computer Algebra: Gröbner Bases and the Nullstellensatz* (PhD Thesis), Jan 1989.
Assistant Professor, Holy Cross College, Boston, Massachusetts. [*Tudor Investments, hedge fund]

Chung-jen Ho, *Topics in Algebraic Computing: Subresultants, GCD, Factoring and Primary Ideal Decomposition* (PhD Thesis), July 1989.
Osborne-Xerox Lab, Palo Alto, California. [*High Tech Entrepreneur in Silicon Valley, California]

Juergen Sellen, Postdoctoral Associate, *Research in Exact Geometric Computation*, 1994-1995.
Research Position, University of Saarbrücken, Germany. [*ESG GmbH, Munich, Germany]

Joonsoo Choi, *Geodesic problems in high dimensions* (PhD Thesis), June 1995. Researcher in Korea Telecommunications, Seoul, Korea. [*Assistant Professor, KookMin University, Seoul]

Kouji Ouchi, *Real/Expr: Implementation of an Exact Computation Package* (Masters Thesis), Jan 1997.
Ph.D. Student in Computer Science, Texas A&M University.

Ee-Chien Chang, *Foveation Techniques and Scheduling: Issues in Thinwire Visualization* (PhD Thesis), May 1998. Assistant Professor, National University of Singapore, and Postdoc at DIMACS-NEC Research Institute (NECI), 1999-2000. [*Assistant Professor, National University of Singapore]

Chen Li, *Exact Geometric Computation: Theory and Applications* (PhD Thesis), Jan 2001. Technical Staff Member, Yahoo Wireless Group, Sunnyvale, California. Technical Staff, Yahoo Research. [*ditto]

Sylvain Pion, NSF Postdoctoral Associate on *Robust Geometric Computation*, April-September 2002. Postdoctoral position at Max-Planck Institute of Computer Science, Saarbruecken, Germany. [*Researcher, INRIA Sophia-Antipolis, France]

Kenneth Benjamin Been, *Responsive Thinwire Visualization of Large Geographic Datasets* (PhD Thesis), Sep 2002. Assistant Professor of Computer Science, Yeshiva University, New York [*ditto]

Ting-jen Yen, *Profile-based Edge Detector* (PhD Thesis), June 2003. Infowrap Technologies, Inc., Taiwan [*ditto]

Zilin Du, *Transcendental and Algebraic Computation made Easy: Theory and Implementations* (PhD Thesis), May 2006. Engineer, Google Inc, Mountainview, California. [*ditto]

Vikram Sharma, *Complexity Analysis of Algorithms in Algebraic Computation* (PhD Thesis), Oct 2006. Postdoc, INRIA Sophia-Antipolis, France. [*Postdoc, Max-Planck Institute of Computer Science, Saarbruecken, Germany]

Books and Patents

1. *Advances in Robotics, Volume 1: Algorithmic and geometric issues*
Editors J. Schwartz and C. Yap, March, 1987. Lawrence Erlbaum Associates, Inc. Review: *Zentralblatt für Math. und ihre Grenzgebiete*, Math Abstracts 68004, Vol. 701.
2. *Fundamental Problems of Algorithmic Algebra*.
Chee K. Yap, Oxford University Press, 2000.
ISBN 0-19-512516-9, 511 pp. Preliminary version available since 1991 from URL <http://cs.nyu.edu/yap/book/>.
Reviews by R. Fateman in *Computing Reviews*, 2000, and by Arjeh M. Cohen in *Mathematics of Computation*, 71:239(2002)1333.
3. *Robust Geometric Computation*.
K. Mehlhorn and C. Yap. Book Manuscript (download from URL <http://cs.nyu.edu/yap/bks/egc/>)
4. *Introduction to the Theory of Complexity Classes*.
Chee K. Yap. Since 1986, preprint of first 8 chapters is available from the URL <http://cs.nyu.edu/yap/bks/complexity/>. I also include chapters on quantum complexity and on real computation.
5. *Algorithmics*.
Chee K. Yap. 15 chapters on various topics in algorithms and data structures, graduate level. Preprint available on request.
6. U.S. Patent No. 6182114. *Apparatus and method for realtime visualization using user-defined dynamic, multi-foveated images*. Issued Jan 30, 2001.
7. U.S. Patent No. 6594687. *Client Apparatus for providing a realtime visualization of at least one image*. Issued Jul 15, 2003.
8. U.S. Patent No. 6606655. *Server Apparatus for providing a realtime visualization of at least one image*. Issued Aug 12, 2003.

Publications

- [1] W. D. Brownawell and Chee K. Yap. Lower bounds for zero-dimensional projections, 2009. Submitted.
- [2] Michael Burr, Felix Krahmer, and Chee Yap. Integral analysis of evaluation-based real root isolation, February 2009. Submitted, 2009.
- [3] Chee K. Yap. A real elementary approach to the master recurrence and generalizations, July 2008. Submitted.
- [4] Long Lin and Chee Yap. Adaptive isotopic approximation of nonsingular curves: the parametrizability and non-local isotopy approach. In *Proc. 25th ACM Symp. on Comp. Geometry*, page to appear, July 2009. Invited for Special Conference Issue of Discrete and Computational Geometry.
- [5] Chee K. Yap and Jihun Yu. Foundations of exact rounding. In *Proc. WALCOM 2009*, volume 5431 of *Lecture Notes in Computer Science*, 2009. To appear. Invited talk, 3rd Workshop on Algorithms and Computation, Kolkata, India.
- [6] M. Burr, S.W. Choi, B. Galehouse, and C. Yap. Complete subdivision algorithms, II: Isotopic meshing of singular algebraic curves. In *Proc. Int'l Symp. Symbolic and Algebraic Computation (ISSAC'08)*, pages 87–94, 2008. Hagenberg, Austria. Jul 20-23, 2008.
- [7] C. Yap and H. Hong. Guest editorial foreword: Algorithms and complexity of continuous computation. *Math. in Computer Sci.*, 1(1):3–7, 2007. Inaugural issue of journal from Birkhauser.
- [8] Chee-Keng Yap and Vikram Sharma. Robust geometric computation. In Ming-Yang Kao, editor, *Encyclopedia of Algorithms*. Springer, 2008. 1166 pp.
- [9] Jin-San Cheng, Xiao-Shan Gao, and Chee K. Yap. Complete numerical isolation of real zeros in general triangular systems. In *Proc. Int'l Symp. Symbolic and Algebraic Comp. (ISSAC'07)*, pages 92–99, 2007. Waterloo, Canada, Jul 29-Aug 1, 2007. DOI: <http://doi.acm.org/10.1145/1277548.1277562>. In press, Journal of Symbolic Computation.
- [10] Chee K. Yap. Is it Really Zero? *KIAS Newsletter*, Spring(34), 2007.
- [11] Chee K. Yap. Theory of real computation according to EGC. In P. Hertling, Ch.M. Hoffmann, W. Luther, and N.Revol, editors, *Reliable Implementation of Real Number Algorithms: Theory and Practice*, number 5045 in Lecture Notes in Computer Science, pages 193–237. Springer, 2008. Papers from Dagstuhl Seminar No.06021, Jan 8-13, 2006.
- [12] Sung Woo Choi, Sung il Pae, Hyungju Park, and Chee Yap. Decidability of collision between a helical motion and an algebraic motion. In *7th Conf. on Real Numbers and Computers (RNC 7)*, 2006. LORIA, Nancy, France. Jul 10-12, 2006.
- [13] Ovidiu Daescu, Joseph S.B. Mitchell, Simeon Ntafos, James D. Palmer, and Chee K. Yap. An experimental study of weighted k -Link shortest path algorithms. In Bruno Siciliano, Oussama Khatib, and Frans Groen, editors, *Algorithmic Foundations of Robotics VII*, volume 47 of *Springer Tracts in Advanced Robotics*, pages 187–202. Springer-Berlin, 2008. 7th Int'l Workshop on Algorithmic Foundations of Robotics (WAFR). Jul 16-18, 2006, New York.
- [14] Ovidiu Daescu, Joseph S. B. Mitchell, Simeon Ntafos, James D. Palmer, and Chee K. Yap. Finding a shortest k -link path in a weighted subdivision. In *Proc. 22nd Annual ACM Symposium on Computational Geometry (Video Review)*, pages 483–484, 2006.

- [15] Ken Been, Eli Daiches, and Chee Yap. Dynamic map labeling. *IEEE Transaction on Visualization and Computer Graphics*, 12(5):773–780, 2006. Baltimore, Maryland. Oct 29–Nov 3, 2006. Acceptance rate 24/124. In ACM Computing Reviews, #134041, Mar 2007: http://www.reviews.com/review/review_review.cfm?review_id=134041.
- [16] Arno Eigenwillig, Vikram Sharma, and Chee Yap. Almost tight complexity bounds for the Descartes method. In *Proc. Int’l Symp. Symbolic and Algebraic Computation (ISSAC’06)*, 2006. Genova, Italy. Jul 9-12, 2006. Eigenwillig and Sharma won the Best Student Author Award for this paper, shared with G.Moroz.
- [17] S. Pion and C. Yap. Guest editorial: Special issue on robust geometric algorithms and their implementations. *Comput. Geometry: Theory and Appl.*, 33(1 & 2):1–2, January 2006.
- [18] Zilin Du and Chee Yap. Uniform complexity of approximating hypergeometric functions with absolute error. In Sung-il Pae and Hyungju Park, editors, *Proc. 7th Asian Symp. on Computer Math. (ASCM 2005)*, pages 246–249, 2006. Korea Institute for Advanced Study, Seoul, Dec 8–10, 2005.
- [19] Vikram Sharma, Zilin Du, and Chee Yap. Robust approximate zeros. In Gerth Stølting Brodal and Stefano Leonardi, editors, *Proc. 13th European Symp. on Algorithms (ESA)*, volume 3669 of *Lecture Notes in Computer Science*, pages 874–887. Springer-Verlag, April 2005. In ‘Design and Analysis’ track. Acceptance rate: 55 out of 185.
- [20] Zilin Du, Vikram Sharma, and Chee Yap. Amortized bounds for root isolation via Sturm sequences. In Dongming Wang and Lihong Zhi, editors, *Symbolic-Numeric Computation*, Trends in Mathematics, pages 113–130. Birkhäuser Verlag AG, Basel, 2007. Proc. Int’l Workshop on Symbolic-Numeric Computation, Xi’an, China, Jul 19–21, 2005.
- [21] Ovidiu Daescu, Joseph S.B. Mitchell, Simeon Ntafos, James D. Palmer, and Chee K. Yap. k -Link shortest paths in weighted subdivisions. In Frank Dehne, Alejandro López-Ortiz, and Jörg-Rüdiger Sack, editors, *Lecture Notes in Computer Science*, volume 3608, pages 325–337. Springer Verlag, 2005. Proc. 9th Workshop on Algorithms and Data Structures (WADS 2005) Aug 15-17, 2005, Waterloo, Canada.
- [22] Chee K. Yap. Complete subdivision algorithms, I: Intersection of Bezier curves. In *22nd ACM Symp. on Comp. Geometry*, pages 217–226, July 2006.
- [23] Ee-Chien Chang, Sung Woo Choi, DoYong Kwon, Hyungju Park, and Chee Yap. Shortest paths for disc obstacles is computable. *Int’l. J. Comput. Geometry and Appl.*, 16(5-6):567–590, 2006. Special Issue of IJCGA on Geometric Constraints. (Eds. X.S. Gao and D. Michelucci). Also: Proc.21st SoCG, 2005, pp.116–125.
- [24] Paul Harrington, Colm Ó Dúnlaing, and Chee K. Yap. Optimal Voronoi diagram construction for convex sites in three dimensions. *Int’l. J. Comput. Geometry and Appl.*, 17(6):555–593, 2007.
- [25] Deok-Soo Kim, Kwangseok Yu, Youngsong Cho, Donguk Kim, and Chee Yap. Shortest paths for disc obstacles. In Antonio Lagaá et al., editor, *Proc. Computational Sci. and Its Applic. (ICCSA 2004)*, number 3045 in *Lecture Notes in Computer Science*, pages 62–70, 2004. Intl. Workshop on Comp. Geom. and Applic., at ICCSA 2004, S. Maria degli Angeli, Assisi (Perugia, Italy) May 14–17, 2004.
- [26] Lutz Kettner, Kurt Mehlhorn, Sylvain Pion, Stefan Schirra, and Chee Yap. Classroom examples of robustness problems in geometric computation. *Comput. Geometry: Theory and Appl.*, 40(1):61–78, 2007. Also: Proc. 12th European Symp. on Algorithms (ESA’04), Bergen, Norway. pp.702-713, LNCS No.3221. DOI: <http://dx.doi.org/10.1016/j.comgeo.2007.06.003>.

- [27] Chen Li, Sylvain Pion, and Chee Yap. Recent progress in Exact Geometric Computation. *J. of Logic and Algebraic Programming*, 64(1):85–111, 2004. Special issue on “Practical Development of Exact Real Number Computation”. Based on invited talk, DIMACS Workshop on Algorithmic and Quantitative Aspects of Real Algebraic Geometry in Math. and Comp. Sci., Mar 12 - 16, 2001.
- [28] Chee K. Yap. On guaranteed accuracy computation. In Falai Chen and Dongming Wang, editors, *Geometric Computation*, chapter 12, pages 322–373. World Scientific Publishing Co., Singapore, 2004. Based on 2 keynote speeches: *National Theoretical Comp. Sci. Conf.*, Changsha, China (Oct 13-17, 2002), and *Int. Conf. Computational Sci. & Applic. (ICCSA)*, Montreal, Canada (May 18-21, 2003).
- [29] Chee K. Yap. Robust geometric computation. In Jacob E. Goodman and Joseph O’Rourke, editors, *Handbook of Discrete and Computational Geometry*, chapter 41, pages 927–952. Chapman & Hall/CRC, Boca Raton, FL, 2nd edition, 2004.
- [30] Tetsuo Asano, David Kirkpatrick, and Chee Yap. Minimizing the trace length of a rod endpoint amidst polygonal obstacles is NP-hard. In *15th Canadian Conf. on Comp. Geometry*, Aug 11-13, Halifax, Nova Scotia, 2003.
- [31] Sylvain Pion and Chee Yap. Constructive root bound method for k -ary rational input numbers. *Theor. Computer Science*, 369(1-3):361–376, 2006. Also: Proc.19th SoCG, 2003, 256–263.
- [32] Chee Yap, Sylvain Pion, Zilin Du, and Zhihua Wang. Provably robust volume meshing. In *Proc. 23rd Army Science Conference*, 2002. Poster Presentation. Orlando, Florida, December 2-5, 2002. URL <http://www.asc2002.com/>. Paper download: <ftp://cs.nyu.edu/pub/local/yap/exact/mesh.ps.gz>.
- [33] Z. Du, M. Eleftheriou, J. Moreira, and C. Yap. Hypergeometric functions in exact geometric computation. In V.Brattka, M.Schoeder, and K.Weihrauch, editors, *Proc. 5th Workshop on Computability and Complexity in Analysis*, pages 55–66, 2002. Malaga, Spain, July 12-13, 2002. In Electronic Notes in Theoretical Computer Science, 66:1 (2002), <http://www.elsevier.nl/locate/entcs/volume66.html>.
- [34] Tetsuo Asano, David Kirkpatrick, and Chee Yap. Pseudo approximation algorithms, with applications to optimal motion planning. *Discrete and Computational Geometry*, 31(1):139–171, 2004. Special Issue of 18th ACM Symp. of Comput. Geom., 2002.
- [35] C. Yap, K. Been, and Z. Du. Responsive thinwire visualization: Application to large geographic datasets. In Erbacher et al., editor, *Proc. SPIE Symp. on Visualization and Data Analysis 2002*, volume 4665, pages 1–12, 2002. 19-25 Jan, 2002, San Jose, California.
- [36] C. Yap, H.Biermann, A. Hertzman, C. Li, J. Meyer, H.K. Pao, and Toto Paxia. A Different Manhattan Project: Automatic statistical model generation. In Erbacher et al., editor, *Proc. SPIE Symp. on Visualization and Data Analysis 2002*, volume 4665, pages 259–268, 2002. 19-25 Jan, 2002, San Jose, California.
- [37] Chee Yap and Yunyue Zhu. Simplified fractional cascading with B-node structure and its application in point location. In *12th Canadian Conf. on Comp. Geometry*, June 2001.
- [38] Chee Yap and Kurt Mehlhorn. Towards robust geometric computation, 2001. Invited White Paper. CSTB-NSF Conference on Fundamentals of Computer Science, Washington DC, July 25-26, 2001. See Appendix, **Computer Science: Reflections on/from the Field**, The National Academies Press, Washington DC, 2004.
- [39] Ee-Chien Chang and Chee Yap. Competitive online scheduling with level of service. *J. of Scheduling*, 6(3):251–268, May 2003. Special Issue on On-line Scheduling. Also: Proc. *7th Ann. Intl. Computing and Combinatorics Conf.* (COCOON), August 20-23, 2001, Guilin, China, in Lecture Notes in CS, Springer.

- [40] Chen Li and Chee Yap. A new constructive root bound for algebraic expressions. In *12th SODA*, pages 496–505, January 2001.
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