Curriculum Vitae
Ioannis Z. Emiris

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Contents

November 4, 2016

1 Scientific Interests

Scientific and Geometric computing, Mathematical modeling, Robotics, Bioinformatics, Data science.
Software development: `http://cgi.di.uoa.gr/~emiris/soft_{alg,geo}.html`.

2 Positions and Education

Since 2012	Adjunct researcher, Institute for Management of Information Systems, ATHENA Research and Innovation Center, Athens, Greece.
Since Sep. 2002	Professor (since Aug. 2007) and Associate Professor (2002-07) of "Algebraic and Geometric Algorithms". Department of Informatics & Telecommunications, University of Athens (UoA), Athens, Greece.
Since Oct. 1995	Researcher, Tenured (Mar. 1997), On leave (Sep. 2002). Institut National de Recherche en Informatique et en Automatique, Sophia-Antipolis, France.
2009	Sabbatical leave. Visiting Researcher: Ecole Normale Supérieure de Paris (rue d'Ulm), Dept Informatics. Ecole Centrale de Paris, Dept Applied Mathematics. INRIA Paris. Université d'Evry, Dept Informatics. Institut des Hautes Etudes Scientifiques, Paris. Université Paris-Dauphine / CNRS.
July - Aug. 2002	Visiting Researcher, Computer Science Dept, and ORCCA, Western Univ., London, Ontario, Canada.
Jan. - Dec. 2000	Visiting Associate Professor. Computer Science Dept, U. Crete, Greece.
Jan. 2000	Habilitation à Diriger des Recherches. Title: "Algebraic and geometric algorithms". Engineering School, University of Nice & Sophia-Antipolis, France.
October 1999	Visiting Researcher, Electro-Technical Lab, Tsukuba, Japan.
Jan. - Jul. 1995	Postdoctorate Fellow, HCM Program, EU. INRIA Sophia-Antipolis, France.
December 1994	Ph.D. in Computer Science, University of California at Berkeley. Thesis title: "Sparse Elimination and Applications in Kinematics." Committee: Professors J.F. Canny (adviser), K. Ribet, and R. Seidel.
Fall 1992	Visiting Graduate Student. Mathematics Dept, U. Nice, France.
May 1991	M.Sc. in Computer Science, UC Berkeley. Adviser: Prof. J.F. Canny.
June 1989	B.Sc.Eng. in Computer Science, Princeton U.; High Honors. Thesis Adviser: Prof. R.E. Tarjan.

3 Teaching Experience

UoA, Department of Informatics & Telecoms, Associate professor and Professor

- Discrete Mathematics (1st year, Fall). 2002, 2004–08, 2016
- Mathematics for Computer Science (3rd year). 2008, 2010.
- Software development for hard algorithmic problems (4th year, Fall). 2014–16.
- Computational Geometry (4th year, Spring). 2002–08, 2010–12, 2014–16.
- Special Topics in Theoretical Informatics: Algorithms in structural molecular biology (4th year, Spring). 2005, 2008, 2010, 2015–16.
- Computational Geometry (Grad, Spring). 2003, 2005–08, 2010–12, 2014–16.
- Computational Algebra (Grad, Fall). 2003, 2005–07, 2010–11, 2013–16.
- Algorithms in Structural Bioinformatics (Grad, Spring). 2008, 2010–12, 2014–16; jointly with MSc in Informatics Technologies in Medicine and Biology. Algebraic and Geometric Algorithms in Molecular Biology (Grad), 2004–06; jointly with MSc in Bioinformatics (Biology dept).

Greek Open University, Scientific collaborator
Foundations of Computer Science: Algorithms and Complexity (3rd year), 2005-06.

University of Crete, Department of Computer Science, Visiting Associate professor
– Data Structures (2nd year). Fall 2000.
– Discrete Mathematics (1st year). Spring 2000.
– Computational Geometry (Grad, half course). Spring 2000.
– Algebraic Algorithms (Grad, half course). Spring 1999.

University of Marseilles, Department of Mathematics. Visiting instructor
Computer Algebra (1/2 course), Spring 1998. MSc Discrete Math & Foundations of Computer Science.

University of Nice, Department of Mathematics. Visiting instructor
– Computer algebra and System solving (Grad, half course). Spring 1995–1997, 2001.
– Combinatorics and Probability (3rd year, classes). Fall 1997.
– Linear Algebra and Optimization for Physicists and Engineers (2nd year, classes). Spring 1997.

UC Berkeley, Department of EECS. Teaching assistant (1989-91)

4 Research collaborators and Students

Postdoctoral/Research collaborators

E. Markou, 2004-06. I. Kotsireas, 2006-08. E. Tsigaridas, 2010. C. Konaxis, 2011, 2014-16. L. Penaranda, 2011. T. Luu Ba, 2012. C. Fragoudakis, R. Vidunas, 2013-14. Z. Zafeirakopoulos, 2014. I. Avrithis, N. Kourniatis, G. Petroulakis, A. Aretaki, 2015.

Doctoral students

1. Elias Tsigaridas (2/03–9/06). Algebraic algorithms and applications to geometry.
2. George Tzoumas (5/05–9/09). Computational geometry for curved objects and Voronoi diagrams in the plane.
3. Christos Konaxis (8/05–6/10). Algebraic algorithms for system solving and applications to robotics.
4. Christos Syrseloudis (8/05–6/11). Efficient algorithms for the study, the design, and the kinematics of parallel robots, with applications to physiotherapy.
5. Tatjana Kalinka (9/09–6/13). Change of representation of rational curves and surfaces.
6. Vissarion Fisikopoulos (10/09–4/14). High-dimensional polytopes defined by oracles: algorithms, computations and applications.
7. Anna Karasoulou (since 9/11). Algebraic combinatorics and resultant methods for polynomial system solving.
8. Ioannis Psarros (since 5/15). Dimensionality reduction and Geometric search in general dimension.
9. Vangelis Bartzos (since 4/16). Algebraic elimination for modeling motion.
10. Vangelis Anagnostopoulos (since 4/16). Approximate geometric algorithms for massive pointsets.
11. Clement Laroche (since 9/16). Algebraic and point-cloud representations of geometric objects.

Master's and Bachelor's theses

– MSc, Dept Informatics & Telecoms, UoA: K. Zervoudakis (2001), A. Kakargias (2004), G. Tzoumas (2005), M. Karousos (2005), K. Tsirogiannis (2007), Z. Zafirakopoulos (2008), A. Mantzaflaris (2008), C. Zarkadas (2011), M. Sotiropoulou (2013), K. Gavriil (2016).
– MSc in Logic, Algorithms & Computation, joint with Math dept: C. Konaxis (2005). D. Diochnos (2006). A. Varvitsiotis, V. Fisikopoulos (2009). A. Konstantinakis-Karmis, M. Thanos-Filis (2012). D. Nicolopoulos (2014). I. Psarros (2015). L. Kavouras, E. Anagnostopoulos (2016).
– MSc in Bioinformatics (Dept of Biology until 2006): E. Fritzilas (2005). I. Valavanis, S. Pantos (2006). T. Manousidou (2012). M. Fytros, A. Kalamara (2014). A. Fotopoulos, A. Papathanasiou (2015).
– MSc Computer Science Dept, Univ. of Crete at Heraklio: T. Nikitopoulos (2001).
– MSc Université de Nice et Sophia-Antipolis: T. Giordano (1996), F. Livigni (1996), P. Mario (2000), C. Gaudon (2000).

Supervised 17 students on their Bachelor's thesis.

5 Research Projects

2017–2021 Research and Innovation Staff Exchange (M. Sklodowska Curie Actions, H2020), EU. Learning and Analyzing Massive / Big complex Data (LAMBDA). Consortium: UoA (Greece, coordinator), 3Dshapes (UK), AXA Assurances (France), Ohio State U., Stanford U., UC Berkeley (USA). Coordinator.

2016–2019 Initial Training Network (M. Sklodowska Curie Actions, H2020), EU. Algebraic Representations for Computer-Aided Design of complEx Shapes (ARCADES). Consortium: ATHENA (Greece, coordinator), U. Barcelona (Spain), INRIA Sophia-Antipolis (France), J. Kepler U. (Austria), SINTEF (Norway), U. Strathclyde (UK), TU Wien (Austria), Evolute GmBH (Austria). Coordinator.

2015–2016 Innovation for Manufacturing I4MS project "CloudFlow" (ICT, FP7), EU. Electronic Design Automation: modeling of MEMS sensors on the cloud. Partners: HELIC Inc. (Greece, coordinator), ESS Ltd (Greece). ATHENA Site leader.

2012–2015 Aristeia (Excellence) Project, Greek Ministry of Development. ESPRESSO: Exploiting Structure in Polynomial Equation and System Solving with Applications to Geometric and Game Modeling. Coordinator.

2012–2015 Thales Project, Greek Ministry of Education. Geometric computing and critical applications. Partners: National Technical University of Athens, FORTH (Heraklion, Crete). Coordinator.

2010–today Advisor to OpenFund and OpenFund II, a start-up capital fund, focusing on high-technology companies in South-eastern Europe.

2010–2013 FET-Open STREP (IST, FP7), EU. Computational Geometry Learning. Partners: U. Jena (Germany, coordinator), U. Groeningen (Holland), ETH Zürich (Switzerland), Freie U. Berlin (Germany), INRIA (France), U. Tel-Aviv (Israel). UoA Site Leader.

2008–2012 Initial Training Network (Marie Curie Actions, FP7), EU. Shapes, Geometry, and Algebra (SAGA). Partners: SINTEF (Norway, coordinator), INRIA Sophia-Antipolis (France), J. Kepler U. (Austria), Kongsberg GmBH (Austria), Missler Software (France), GraphiTech (Italy), U. Oslo (Norway), U. Cantabria (Spain), Vilnius U. (Lithuania). UoA site Leader.

2005–2008 FET-Open STREP (IST, FP7), EU. Algorithms for Complex Shapes, with certified numerics (ACS). Partners: U. Groeningen (Holland, coordinator), ETH Zürich (Switzerland), Freie U. Berlin (Germany), GeometryFactory (France), INRIA (France), MPI (Germany), U. Tel-Aviv (Israel). UoA site Leader.

2005–2009 PENED, Greek Ministry of Development. Efficient algorithms for parallel robots with applications to physiotherapy. Partner: Reflexion Ltd. Coordinator.

2006–2008 ENTER, Greek Ministry of Development. Efficient algorithms and implementations for representing and handling curves and surfaces. Partner: MP & Associates Ltd. Coordinator.

2004–2007 "Pythagoras", Greek Ministry of Education. Coordinator.

2003–2007 Associate Team with Galaad, INRIA Sophia-Antipolis. Algebraic algorithms for system solving, structured matrices. UoA site Leader.

2004–2006 PLATON bilateral collaboration with INRIA Sophia-Antipolis. Calibration of space robots for earth observation. UoA site Leader.

2001–2004 FET-Open STREP (IST, FP6). EU. Effective Computational Geometry for Curves and Surfaces (ECG). Consortium: INRIA (coordinator), ETH Zürich, Freie U. Berlin, MPI, U. Groeningen, U. Tel-Aviv. Member of INRIA.

2002–2003 Multilateral project with CNRS-Montpellier, INRA, Institut Pasteur (Paris). Distance Geometry and Genomics. Member of INRIA.

2001–2003 Bilateral Project with U. Buenos Aires (ECOS-Sud). Robust methods in algebraic system solving and applications to geometric modeling. INRIA Site Leader.

2002 Bilateral Project with INRA Avignon. INRIA funding. Surface implicitization and singularities (SIMPLES). Coordinator.

2000–2002 FET-IST Project. European Union. Applications of approximate algebraic geometry in industrial computer aided design (GAIA). Collaboration between INRIA, U. Cantabria, U. Nice, U. Oslo, SINTEF, Think3. Member of INRIA.

2000–2001 Bilateral project with City U. Hong-Kong (Procore). Algebraic and numeric methods for solving sparse polynomial systems and their applications to economics, finance and game theory. INRIA Site Leader.

1998–1999 Bilateral collaboration with U. Patras, Greece (PLATON). Symbolic-numeric methods for solving sparse systems of algebraic equations. Member of INRIA.

1997–1999 Robust tools for numeric computation (FIABLE). INRIA network.

1996–1999 ESPRIT Reactive LTR project 21.024. Framework for the Integration of Symbolic-Numeric Computing (FRISCO). Member of INRIA Sophia-Antipolis.

Nov. 1996 Univ. of North Carolina, Computer Science Dept. Collaboration with Prof. D. Manocha

1994–1995 Silma Corporation, San Jose, California. Consultant for robotics applications.

6 Professional Service and Honors (selected)

Citations	More than 320 on Citeseer in September 2005. Hirsch's H-index = 36 (Google scholar).
Journal editor	• *Journal of Symbolic Computation*, Elsevier. Associate editor, since 2003. • *Mathematics for Computer Science*, Birkhauser. Associate editor, since 2016. • *Theoretical Computer Science*, Guest co-editor (with B. Mourrain and V. Pan), Special Issue on Symbolic-Numeric Algorithms, published in 2004. • *Computational Geometry: Theory & Applications*, Elsevier. Guest co-editor (with L. Palios), Special Issue on Europ. Workshop Comp. Geom. 2006, published in 2008. • *Journal of Symbolic Computation*. Guest co-editor (with E. Schost), Special Issue on ISSAC 2011, published in 2013.
Program Comm. Chair	• Annual ACM International Symposium on Symbolic & Algebraic Computation (ISSAC) 2011, San Jose, Calif.
Program Committee member	• SIAM Conference on Applied Algebraic Geometry, Colorado 2013. • 20th European Symposium on Algorithms (ESA 2012), Algorithm Engineering Track, Ljubljana 2012. • Annual ACM Intern. Symposium on Symbolic & Algebraic Computation (ISSAC): 2001, 2007, 2012, 2014, 2016. • Annual ACM/SIAM Joint Conference on Geometric and Physical Modeling 2011 (Orlando), 2010 (Israel), 2009 (San Francisco), 2008 (New York). • International conference on Geometric Modeling and Processing, June 2010, Spain. • International Workshop on Computer Algebra in Scientific Computing (CASC): 2005–2013. • Annual International IEEE Engineering in Medicine & Biology Conference, 2009, 2011, 2013. • Computer Graphics International (CGI) 2004, 2013, 2014. • Annual International Conference on Algebraic Informatics 2009, Greece. • IEEE Conference on Bioinformatics and Bioengineering (BIBE) 2008, Greece. • Workshop on Symbolic-Numeric Computation (SNC) 2005, 2007. • International Mathematica Symposium, Avignon, France, 2006.
Boards	Advisory board. International conference on Effective Methods in Algebraic Geometry (MEGA), 2004–today. Tutorial chair. Annual ACM Intern. Symposium on Symbolic & Algebraic Computation (ISSAC), 2008.

Distinctions	2016. Invited speaker. Annual ACM International Symposium on Symbolic & Algebraic Computation, 2016; Waterloo, Canada. 2010. Distinguished Paper Award, Annual ACM International Symposium on Symbolic & Algebraic Computation 2010, "The DMM bound: multivariate aggregate separation bounds", with B. Mourrain and E. Tsigaridas. 2002. Distinguished Paper Award, Annual ACM International Symposium on Symbolic & Algebraic Computation 2002, "Multihomogeneous Resultant Formulae by Means of Complexes", with A. Dickenstein. 1995, Fall. TMR Postdoc fellowship award, European Commission (declined). 1990–1994. Non-resident tuition scholarship, EECS Dept., UC Berkeley. 1988, 1989. Elected to honorary societies Tau Beta Pi (engineering), Sigma Xi (scientific), and Phi Beta Kappa (academic). 1985–1989. Full tuition, room and board scholarship, Princeton University.
Journal referee	Algorithmica. Computational Geometry: Theory & Applications. Computer-Aided Design. Computer-Aided Geometric Design. Discrete and Computational Geometry. IEEE Trans. Nanobioscience. IEEE Trans. Pattern Analysis & Machine Intelligence. IEEE Trans. Robotics. Information Proc. Letters. Intern. J. Computational Geometry & Applications. Intern. J. Control. Intern. J. Robotics Research. J. Algebraic Combinatorics. J. Algorithms. J. Applicable Algebra in Engineering, Communications & Computing. J. Complexity. J. Foundations of Computational Mathematics (FOCM). J. Symbolic Computation. Linear Algebra & Applications. Pattern Analysis & Applications. Robotica. SIAM J. Computing. SIAM J. Numerical Analysis. SIAM J. Scientific Computing. Theoretical Computer Science.
Conference referee	ACM Intern. Symp. Symbolic & Algebraic Computation (ISSAC). ACM Symp. Solid Modeling & Applications. ACM Symp. Theory of Computing (STOC). ACM-SIAM Symp. Discrete Algorithms (SODA). AMS-SIAM Conf. Applied Mathematics. Asian Symp. Computer Mathematics (ASCM). Canadian Conf. Computational Geometry. Computability in Europe: Logical Approaches to Computational Barriers. European Symp. Algorithms (ESA). IEEE Bioinformatics & BioEngineering (BIBE). IEEE Engineering in Medicine & Biology Conference. IEEE Foundations of Computer Science (FOCS). IEEE Intern. Symp. Computer-Aided Control Systems Design. Intern. Conf. Geometric Modeling & Processing (GMP). Intern. Colloq. Automata, Languages & Programming (ICALP). Intern. Symp. Algorithms & Computation (ISAAC). Intern. Symp. Effective Methods in Algebraic Geometry (MEGA). Intern. Symp. Theoretical Aspects of Computer Science (STACS). Symp. Geometric Processing. Robotics: Science & Systems. Workshop on Algorithm Engineering.
Promotion committees	Several in UoA and Greek Universities; two times coordinator. Frederick University, Cyprus. "Habilitation à Diriger des Recherches": two times.
Other refereeing	EU FP7: Marie-Curie (People) Individual Fellowships, FET program, COST program. National Science Foundations: Austria, Cyprus, The Netherlands, Slovenia, Switzerland, USA. South Moravian Regional Science Foundation. NSA-AMS Funding agency. Greek Ministry of Education. Tel Aviv University, Israel. Birkhäuser Publishing Co.

Service in the Department (selected)

2004. Member of exam committee of International Olympiad of Informatics.
2004–today. Student exchanges with U. Nice, France, and U. Lugano, Switzerland (Erasmus).
2005–2009. Head of Committee on Research and Development.
2007–today. Member of the coordination committee of the Graduate program in Informatics technologies in Medicine and Biology.
2010–today. Coordinator of bilateral agreement between the University of Athens and INRIA Méditerranée Sophia-Antipolis (France), and Greek contact for INRIA's International Internship program.
2010–2012. Head of Division on Theoretical Computer Science.

Conferences / Schools Organized

International Workshop on Symbolic-Numeric Algebra for Polynomials (SNAP), 7/96, INRIA Sophia-Antipolis; co-organizer.

Special session on Sparse Elimination Methods in Polynomial System Solving, AMS Spring Eastern Meeting, 4/98, Philadelphia, Pennsylvania; co-organizer.

CIMPA-Unesco School on Solving Systems of Polynomial Equations, Buenos-Aires. Co-organized with A. Dickenstein, 2003. Followed by: I Latin-american Workshop on Systems of Polynomial Equations, 7/03, Buenos-Aires.

2nd Latin-american School and Workshop on Polynomial Systems, 2/05, Angra dos Reis, Brazil, co-organizer.

International Workshop on Computer Algebra in Scientific Computing (CASC), 9/05, Kalamata, Greece, co-organizer.

European Workshop of Computational Geometry, 3/06, Delphi, Greece; co-organizer.

Global optimization: Integrating convexity, optimization, logic programming & computational algebraic geometry, Fall 2006, E. Schrödinger Institute, Vienna. Coordinator: A. Neumeier.

Institute of Mathematics and its Applications (IMA), Minneapolis. Special Year on Applications of Algebraic Geometry, 2006-07. Co-organized the Concentration and Workshop on Nonlinear Computational Geometry.

School on Shapes, Geometry, and Algebra (SAGA), October 2010, Kolympari, Greece.

Research Workshop on Computational Geometric Learning (CGL), 30 September – 2 October, 2013, Vravrona, Greece.

7 Invited Talks (selected)

- AMS-MAA Joint Mathematics Meetings ; 1/1993.
- AMS-IMS-SIAM Conference on Continuous Algorithms & Complexity, Mt. Holyoke, USA; 6/1994
- International Geometric Software Workshop, The Geometry Center, Minneapolis; 1/1995.
- French Conference on Computational Geometry, Le Bessat, France; 3/1996.
- Intern. Algebraic Conference in memory of D. Fadeev, Plenary session, St. Petersburg, Russia; 6/1997.
- Dagstuhl seminar on Symbolic-algebraic methods and Verification: Saarbrücken, Germany, 11/1999.
- AMS-IMS-SIAM Conference on Computer Algebra: Solving equations in algebra, geometry and engineering, Mt. Holyoke, Mass.; 6/2000.
- Dagstuhl seminar on the Integration of geometric and algebraic software, Saarbrücken, Germany; 2001.
- Fields Institute Conference on Symbolic Computational Algebra, London, Ontario; 7/2002.
- Conference on Foundations Of Computational Mathematics (FOCM), Minneapolis, USA; 8/2002.
- Spanish Conference on Computer Algebra (EACA), Valladolid, Spain; 9/2002.
- DIMACS workshop on the Implementation of geometric algorithms; New Jersey, 12/2002.
- Dagstuhl seminar on computational geometry, Saarbrücken, Germany; 2003.
- French Conference on Computational Geometry, Giens, France; 9/2003.
- Workshop on Geometry of NMR and structural molecular biology, McGill center, Barbados; 1/2005.
- Oberwolfach mini-workshop on Algebraic surfaces and syzygies, Oberwolfach; 11/2007.
- Conference of SIAM Group on Algebraic Geometry and Applications, Raleigh, USA; 10/2011.
- Workshop on Geometry and Applications, McGill center, Barbados; 2/2014.
- Dagstuhl seminar on Geometric modeling, Saarbrücken, Germany; 2014.
- Semester on Algebraic complexity, Simons Institute, U.C. Berkeley; 2014.
- Dagstuhl seminar on Computational Geometry, Saarbrücken, Germany; 2015.
- Workshop on Symbolic-Numeric Computation, Fields Institute, Toronto; 2015.
- Annual ACM International Symposium on Symbolic & Algebraic Computation (ISSAC), Plenary speaker, 2016.

8 Personal Information

Year / Place of Birth: 1966 / Athens, Greece.
Country of Citizenship: Greece.
Family Status: Married, two children.

9 Publications

(chronological order)

(a) Book and Edited Volumes

[1] I.Z. Emiris, B. Mourrain, and V. Pan, editors. *Theor. Comp. Science. Spec. Issue on Algebraic & Numerical Algorithms*, volume 315(2-3):307–672. Elsevier, May 2004.

[2] A. Dickenstein and I.Z. Emiris, editors. *Solving Polynomial Equations: Foundations, Algorithms and Applications*, volume 14 of *Algorithms and Computation in Mathematics*. Springer-Verlag, Berlin, May 2005.

[3] I.Z. Emiris and L. Palios, editors. *Comput. Geometry: Theory & Applic. Spec. Issue on the 22nd European Workshop on Computational Geometry 2006*, volume 41. Elsevier, October 2008.

[4] I.Z. Emiris. *Computational geometry: A modern algorithmic approach.* Kleidarithmos, Athens, Greece, November 2008. In Greek.

[5] I.Z. Emiris, F. Sottile, and T. Theobald, editors. *Nonlinear computational geometry*, volume 151 of *I.M.A. volumes in Math & its Applications*. Springer, Berlin, October 2010.

[6] I.Z. Emiris and E. Schost, editors. *J. Symbolic Computation, Spec. Issue on Annual ACM Intern. Symp. on Symbolic and Algebraic Computation 2011*, volume 52. Elsevier, May 2013.

(b) Book Chapters

[1] I.Z. Emiris, A. Galligo, and H. Lombardi, Numerical univariate polynomial GCD. In *The Mathematics of Numerical Analysis*, volume 32 of *Lectures in Applied Math.*, pages 323–343. AMS, 1996.

[2] I.Z. Emiris. Symbolic-numeric algebra for polynomials. In A. Kent and J.G. Williams, editors, *Encyclopedia of Computer Science and Technology*, volume 39, pages 261–281. Marcel Dekker, New York, 1998.

[3] I.Z. Emiris and V.Y. Pan. Applications of FFT. In M.J. Atallah, editor, *Handbook of Algorithms and Theory of Computation*, chapter 17. CRC Press, Boca Raton, Florida, 1999. Revised chapter 18: Applications of FFT and Structured matrices, 2010 edition, eds M.J. Atallah and M. Blanton.

[4] A. Díaz, I.Z. Emiris, E. Kaltofen, and V.Y. Pan. Algebraic algorithms. In M.J. Atallah, editor, *Handbook of Algorithms and Theory of Computation*, chapter 16. CRC Press, Boca Raton, Florida, 1999. Revised chapter 17: Algebraic and Numeric Algorithms, 2009 edition, by I.Z. Emiris, V.Y. Pan and E. Tsigaridas, eds M.J. Atallah and M. Blanton. New revision to appear in 2014 edition, also CUNY TR-2012001 (http://tr.cs.gc.cuny.edu/tr).

[5] I.Z. Emiris. Matrix methods for solving algebraic systems. In G. Alefeld, J. Rohn, S. Rump, and T. Yamamoto, editors, *Symbolic Algebraic Methods and Verification Methods*, Springer Mathematics, pages 69–78. Springer-Verlag, Wien, 2001.

[6] I.Z. Emiris. Discrete geometry for algebraic elimination. In M. Joswig and N. Takayama, editors, *Algebra, Geometry, and Software Systems*, Mathematics and Visualization, pages 77–91. Springer-Verlag, Berlin, 2003.

[7] C. D'Andrea and I.Z. Emiris. Sparse resultant perturbations. In M. Joswig and N. Takayama, editors, *Algebra, Geometry, and Software Systems*, Mathematics and Visualization, pages 93–107. Springer-Verlag, Berlin, 2003.

[8] I.Z. Emiris. Sparse resultant and applications to geometric modelling. In A. Dickenstein and I.Z. Emiris, editors, *Solving Polynomial Equations: Foundations, Algorithms and Applications*, volume 14 of *Algorithms and Computation in Mathematics*. Springer-Verlag, Berlin, April 2005.

[9] I.Z. Emiris and I.S. Kotsireas. Implicitization exploiting sparseness. In R. Janardan, M. Smid, and D. Dutta, editors, *Geometric and Algorithmic Aspects of Computer-Aided Design and Manufacturing*, volume 67 of *DIMACS*, pages 281–298. AMS/DIMACS, 2005.

[10] I.Z. Emiris and E.P. Tsigaridas. Minkowski decomposition of convex lattice polygons. In *Algebraic geometry and geometric modeling*, Mathematics & Visualization, pages 217–236. Springer, 2005.

[11] I.Z. Emiris, B. Mourrain, and E.P. Tsigaridas. Real algebraic numbers: Complexity analysis and experimentations. In P. Hertling, C. Hoffmann, W. Luther, and N. Revol, editors, *Reliable Implementation of Real Number Algorithms: Theory and Practice*, volume 5045 of *LNCS*, pages 57–82. Springer, 2008.

[12] I.Z. Emiris, E. Tsigaridas, and A. Varvitsiotis. Mixed volume and distance geometry techniques for counting Euclidean embeddings of rigid graphs. In A. Mucherino, C. Lavor, L. Liberti, and N. Maculan, editors, *Distance Geometry: Theory, Methods and Applications*. Springer, 2013.

[13] A. Dickenstein, I.Z. Emiris, and A. Karasoulou. Plane mixed discriminants and toric jacobians. In *SAGA: Advances in ShApes, Geometry, and Algebra*, volume 10 of *Geometry and Computing*, pages 105–121. Springer, 2014.

[14] I.Z. Emiris, T. Kalinka, and C. Konaxis. Sparse implicitization via interpolation. In *SAGA: Advances in ShApes, Geometry, and Algebra*, volume 10 of *Geometry and Computing*, pages 39–51. Springer, 2014.

[15] I.Z. Emiris and A. Karasoulou. Sparse discriminants and applications. In R. De Amicis and G. Conti, editors, *Future Vision and Trends on Shapes, Geometry and Algebra*, volume 84 of *Proc. Math. & Stat.*, pages 55–71. Springer, 2014.

(c) Theses

[1] I.Z. Emiris. An efficient approach to removing geometric degeneracies. Master's Thesis, Computer Science Division, Univ. of California at Berkeley, May 1991. Committee: Professors J. Canny and B. Barsky.

[2] I.Z. Emiris. *Sparse Elimination and Applications in Kinematics*. PhD Thesis, Computer Science Division, Univ. of California at Berkeley, December 1994. Committee: Professors J. Canny, R. Seidel, K. Ribet.

[3] I. Emiris. *Algorithmes Algébriques et Géométriques*. Habilitation à diriger des recherches, Université de Nice – Sophia-Antipolis, École Doctorale des Sciences pour l'Ingénieur, January 2000. Rapporteurs : Prof. J. Canny, Dr. P. Flajolet, Dr. B. Philippe.

(d) Journal Articles

[1] I.Z. Emiris and J.F. Canny. A general approach to removing degeneracies. *SIAM J. Computing*, 24(3):650–664, 1995.

[2] I.Z. Emiris and J.F. Canny. Efficient incremental algorithms for the sparse resultant and the mixed volume. *J. Symbolic Computation*, 20(2):117–149, 1995.

[3] I.Z. Emiris. On the complexity of sparse elimination. *J. Complexity*, 12:134–166, 1996.

[4] I.Z. Emiris and V.Y. Pan. Techniques for exploiting structure in matrix formulae of the sparse resultant. *Calcolo, Special Issue on Toeplitz Matrices*, 33(3–4):353–369, 1996.

[5] I.Z. Emiris, J.F. Canny, and R. Seidel. Efficient perturbations for handling geometric degeneracies. *Algorithmica, Special Issue on Computational Geometry in Manufacturing*, 19(1/2):219–242, Sep./Oct. 1997.

[6] I.Z. Emiris, A. Galligo, and H. Lombardi. Certified approximate univariate GCDs. *J. Pure & Applied Algebra, Special Issue on Algorithms for Algebra*, 117 & 118:229–251, May 1997.

[7] I.Z. Emiris. A complete implementation for computing general dimensional convex hulls. *Intern. J. Computational Geometry & Applications, Special Issue on Geometric Software*, 8(2):223–253, 1998.

[8] I.Z. Emiris, V.Y. Pan, and Y. Yu. Modular arithmetic for linear algebra computations in the real field. *J. Symbolic Computation*, 26(1):71–87, July 1998.

[9] I.Z. Emiris and B. Mourrain. Computer algebra methods for studying and computing molecular conformations. *Algorithmica, Special Issue on Algorithms for Computational Biology*, 25:372–402, 1999.

[10] H. Brönnimann, I.Z. Emiris, V. Pan, and S. Pion. Sign determination in Residue Number Systems. *Theor. Comp. Science, Spec. Issue on Real Numbers & Computers*, 210(1):173–197, 1999.

[11] I.Z. Emiris and J. Verschelde. How to count efficiently all affine roots of a polynomial system. *Discrete Applied Math., Special Issue on Comput. Geom.*, 93(1):21–32, 1999.

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