

Jorge Cortés

Curriculum vitae

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Mechanical and Aerospace Engineering
Jacobs School of Engineering
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Positions

Associate Professor, Department of Mechanical and Aerospace Engineering
University of California, San Diego, CA (Jul 2009–present)

Assistant Professor, Department of Mechanical and Aerospace Engineering
University of California, San Diego, CA (Jul 2007–Jun 2009)

Assistant Professor, Department of Applied Mathematics and Statistics
University of California, Santa Cruz, CA (Oct 2004–Jun 2007)

Postdoctoral Research Associate, Coordinated Science Laboratory, College of Engineering
University of Illinois at Urbana-Champaign, Urbana, IL (Aug 2002–Sep 2004)

Postdoctoral Research Associate, Systems, Signals and Control Department
University of Twente, The Netherlands (Nov 2001–Jun 2002)

Education

Ph.D., Engineering Mathematics, Universidad Carlos III de Madrid, Spain Dec 2001
Licenciado, Mathematics, Universidad de Zaragoza, Spain Jun 1997

Research Interests

Systems and Control; Sensor Networks; Distributed Coordination Algorithms; Cooperative Control; Geometric and Distributed Optimization; Nonlinear and Geometric Control; Robotics; Applied Computational Geometry; Nonsmooth Analysis

Research Awards and Honors

Invited Speaker, Natural Algorithms Workshop, Center for Computational Intractability, Princeton University, Nov 2009

Plenary Speaker, 28th Benelux Meeting on Systems and Control, Spa, Belgium, Mar 2009

Outstanding Reviewer for IEEE Transactions on Automatic Control, 2009

SIAM Review SIGEST selection from the SIAM Journal on Control and Optimization (w/ F. Bullo), Mar 2009

IEEE Control Systems Magazine Outstanding Paper Award (w/ S. Martínez and F. Bullo), Dec 2008

IEEE Senior Member, Nov 2006

2006 Young Researcher Prize, awarded by the Spanish Society of Applied Mathematics to the “most promising applied mathematician under 33 born or working permanently in Spain,” Sep 2006

Best Student Paper Award (w/ A. Ganguli -student- and F. Bullo), American Control Conference, Minneapolis, Minnesota, Jun 2006

NSF CAREER Award, Division of Electrical, Communications and Cyber Systems (Power, Controls and Adaptive Networks), Mar 2006

Non-Tenured Faculty Development Award, School of Engineering, University of California, Santa Cruz, Jan 2006 and Jan 2005

Best Student Paper Award Finalist (w/ A. Ganguli -student- and F. Bullo), American Control Conference, Portland, Oregon, Jun 2005

Invited Speaker, Workshop on Geometric Control of Mechanical Systems, IEEE International Conference on Decision and Control, Paradise Island, Bahamas, Dec 2004

Plenary Speaker, International Workshop on Global Analysis, Cankaya University, Ankara, Turkey, Apr 2004

Ramón y Cajal Program Awardee, Mathematics, ranked 1st, Spanish Ministry of Science and Technology, Madrid, Spain, Jul 2003

Invited Session Speaker, 1st Joint International Meeting between the American Mathematical Society and the Royal Spanish Mathematical Society, Seville, Spain, Jun 2003

Best Doctoral Dissertation Award, Engineering Mathematics Curriculum, Academic Year 2001-2002, Universidad Carlos III de Madrid, Spain, Jan 2003

Best Student Paper Award (w/ S. Martínez -student- and F. Bullo), IEEE Conference Decision and Control, Las Vegas, Nevada, Dec 2002

Plenary Speaker, 34th Symposium on Mathematical Physics, Torun, Poland, Jun 2002

Graduate Fellowship Recipient, Spanish Ministry of Education and Culture, Jan 1998-Dec 2001

Invited Lectures

Australian National University (Sep 07), Boston University (Nov 07), Ghent University (Belgium, Jun 01 and Aug 05), High Council of Scientific Research (Spain, Dec 06), International Center of Mathematical Meetings (Spain, Sep 06), Monterey Bay Aquarium Research Institute (May 05), Naval Postgraduate School (Nov 05), Queen's University (Canada, Mar 03), Stanford University (Feb 07), Universidad Complutense de Madrid (Spain, Jul 03), Universidad Politécnic de Cataluña (Spain, Feb 01, Feb 02, Jan 03, Jan 04, and Dec 07), University of California, Berkeley (MSRI, Mar 07), University of California, Los Angeles (May 07), University of California, San Diego (Mar 07), University of California, Santa Barbara (Nov 05), University of California, Santa Cruz (Feb 04 and Oct 04), University of Georgia (Feb 03), University of Illinois at Urbana-Champaign (Dec 02 and Oct 03), University of Maryland College Park (Jun 09), University of Minnesota (Apr 04), University of Pennsylvania (May 07), University of Twente (The Netherlands, Nov 01 and Apr 03), University of Wisconsin-Madison (Feb 04)

Research Grants

Current

Co-PI in NSF CNS-0521675, "MRI: Development of an Autonomous Robotic Vehicle Instrument", Major Research Instrumentation initiative, Duration: 10/1/05-9/30/08, Amount: \$360,021

PI in NSF ECCS-0546871, "CAREER: Information-driven distributed coordination of mobile sensor networks in dynamic scenarios", Duration: 3/1/06-2/28/11, Amount: \$400,000

Co-PI in NSF CCF-0829891, "The control landscape of selective cell death", Emerging Models and Technologies initiative, Duration: 9/1/08-8/31/11, Amount: \$900,000

PI in NSF CMMI-0908508, "DynSyst.Special.Topics: Couplings, network dynamics, and stability of multi-agent systems", Duration: 7/15/09-6/30/12, Amount: \$280,000

PI in NSF CCF-0917166, "NetSE: Small: Collaborative Proposal: A Geometric Computational Approach to Efficiently Deploy and Manage Self-Organizing Wireless Communication Networks", Duration: 8/15/09-7/31/12, Amount: \$250,000

PI in NSF OCE-0941692, "CDI Type-II: Distributed Ocean Monitoring via Integrated Data Analysis of Coordinated Buoyancy Drogues", Duration: 1/1/10-12/31/13, Amount: \$1,359,000

Expired

PI in NASA University Aligned Research Program Award TO.030.MM.D., "Distributed formation control strategies for science imaging and interferometry", Duration: 12/1/04-9/30/05, Amount: \$28,406, and Duration: 10/1/05-9/30/06, Amount: \$ 30,298

Professional Service

Editorships

Editorial Board, [IEEE Transactions on Automatic Control](#), 2010-present

Editorial Board, [Systems and Control Letters](#), 2009-present

Editorial Board, [European Journal of Control](#), 2006-2009

Guest Editor, [IEEE Robotics and Automation Magazine](#) Special Issue on "Computational Geometry in Path Planning," volumen 15, issue 2, Jun 08

Guest Editor, [SIAM Journal on Control and Optimization](#) Special Issue on "Control and Optimization in Cooperative Networks," volume 48, number 1, Jan 2009

Associate Editor, Conference Editorial Board, IEEE Control Systems Society, 2005-2009

Program Committees

[ConCom 07](#): Control over Communication Channels, workshop co-located with IEEE WiOpt 2007, April 16-20 2007, Limassol, Cyprus

[ROBOCOMM 07](#), First International Conference on Networked Robots, Sep 10-12 2007, Athens, Greece

[2008 Robotics: Science and Systems](#), Jun 25-28 2008, Zurich, Switzerland

[ROBOCOMM 09](#), Second International Conference on Networked Robots, Mar 31- Apr 2 2008, Odense, Denmark

[1st Workshop on Distributed Estimation and Control in Networked Systems](#), Sep 24-26 2009, Venice, Italy

[International Workshop on Robotic Wireless Sensor Networks](#), Jun 10 2009, Marina del Rey, California

[CDC 2009](#), IEEE Conference on Decision and Control, Dec 16-18 2009, Shanghai, China

[ACC 2010](#), American Control Conference, Jun 30- Jul 2 2010, Baltimore, Maryland

Scientific Committee

[GTMCR2010](#): Workshop on Geometric and Topological Methods in Control and Robotics, October, 4-6, 2010, La Cristalera, Madrid, Spain

Chair of the IEEE Control Systems Society Technical Committee on Manufacturing Automation and Robotic Control, Jan 2009-present

Senior Member IEEE (Control Systems Society and Robotics and Automation Society), 2006-present (member since 2002)

Member SIAM (Activity Group on Control and Systems Theory), 2003-present

Member Spanish Society of Applied Mathematics, 2004-present

Member AMS, 2005-present

Member Royal Spanish Mathematical Society, 2000-2007

Program leader, "[Environmental Sensor Networks](#)," Statistical and Applied Mathematical Sciences Institute (SAMSI), Research Triangle Park, North Carolina, Spring 2008 semester

Conference and Workshop Organization

[16th Southern California Nonlinear Control Workshop](#), University of California, San Diego, November 7, 2008

Workshop Chair, [CDC 2010](#), IEEE Conference on Decision and Control, Dec 15-17 2010, Atlanta, Georgia

Invited Session Organizer

“Control Theory,” XVIII International Workshop on Differential Geometric Methods in Theoretical Mechanics, Jaca, Spain, August 25-29, 2003

“Nonsmooth methods in multi-agent systems,” IEEE Conference on Robotics and Automation, New Orleans, LA, USA, April 26-May 1, 2004

“Control technologies in wireless sensor networks,” IEEE Conference on Decision and Control, Paradise Island, Bahamas, December 14-17, 2004

“Distributed motion coordination,” SIAM Conference on Applications of Dynamical Systems, Snowbird, Utah, May 22-26, 2005

Reviewer, IEEE Transactions on Automatic Control; Automatica; IEEE Transactions on Robotics; IEEE Transactions on Automation Science and Engineering; IEEE Transactions on Signal Processing; IEEE Transactions on Control Systems Technology; Proceedings of the IEEE; ACM Transactions on Sensor Networks; SIAM Journal on Control and Optimization; SIAM Journal on Applied Dynamical Systems; Mathematics of Control, Signals, and Systems; International Journal of Robotics Research; Discrete Event Dynamic Systems: Theory and Applications; Journal of Nonlinear Science; Discrete and Continuous Dynamical Systems; International Journal of Control; European Journal of Control; International Journal of Robust and Nonlinear Control; ASME Journal of Dynamic Systems, Measurement, and Control; IET Control Theory and Applications; Journal of Geometry and Physics; Reports on Mathematical Physics; Methods and Applications of Analysis; Journal of Physics A: Mathematical and General; Physics Letters A; Symmetry, Integrability and Geometry: Methods and Applications; Journal of Geometric Mechanics; Neural Computing and Applications

Reviewer, Springer-Verlag; Prentice Hall; John Wiley&Sons; World Scientific Publishing

Reviewer, American Control Conference (2002, 2004-2010), IEEE Conference on Decision and Control (2002-2009), IEEE Conference on Robotics and Automation (2008-2010), IEEE Multi-conference on Systems and Control (2007-2009), IEEE/RSJ International Conference on Intelligent Robots and Systems (2009), IFAC World Congress (2008), Hybrid Systems: Computation and Control (2004), IEEE Conference on Automation Science and Engineering (2009), IFAC Symposium on System Identification (2009), Robotics: Science and Systems (2005), International Workshop in Global Analysis (2004)

Reviewer, U.S. Civilian Research and Development Foundation (CRDF), Cooperative Grants Program, 2003

Reviewer, Spanish Ministry of Science and Technology grant proposals (2004, 2005)

Reviewer, Israel Science Foundation, 2007

Reviewer and panelist, National Science Foundation (Civil, Mechanical and Manufacturing Innovation, 2008, 2009; Cyber-Physical Systems, 2009)

Reviewer, Air Force Office of Scientific Research (Dynamics and Control Program, 2009)

Software Development

Mathematica packages PlanGeom.m and SpatialGeom.m, planar and spatial geometry computation

University Service

Graduate Affairs Committee, member, 2008-2009

Undergraduate Affairs Committee, member, 2009-2010

Seminar Series

CMPE280C, Seminar on Control (UCSC, Spring 06, Spring 07)

AMS280B, Seminar on Applied Mathematics and Statistics (UCSC, Spring 07)

MAE205, Dynamic Systems and Control Seminar (UCSD, Winter 07, Fall 09)

Ph.D. Committees membership

Bavo Langerock (advisor Frans Cantrijn), “Generalised connections and applications in control theory,” Ghent University, Belgium, 2003

UCSC AMS Hiring Committee, 2005-2006 (Applied Math), 2006-2007 (Statistics)

UCSC AMS Promotion Ad-Hoc Committee, 2006-2007
UCSC AMS Departmental webmaster, 2004-2007

Current Postdoctoral Research Associates

Bahman Gharesifard (2009-2010)

Current Students

Rishi Graham (UCSC AMS, Ph.D. student, 2006-)
Cameron Nowzari (UCSD MAE, Ph.D. student, 2009-)
Mike Ouimet (UCSD MAE, Ph.D. student, 2009-)

Past Students

Anurag Ganguli (UIUC EE, Ph.D. 2007, co-advised with Francesco Bullo, UCSB). Now at UtopiaCompression Corporation
Katie Laventall (UCSC Math, senior undergraduate thesis, 2006-2007). Now at Stanford University, Aero/Astro Ph.D. student
Michael Schuresko (UCSC CS, M.Sc. 2008 and UCSC AMS, Ph.D. 2009)
Rosario Aragués (Universidad de Zaragoza, Spain, visiting Ph.D. student, Spring 08, 09)
Edgardo Chunga (Pontificia Universidad Católica del Perú, Perú, visiting Ph.D. student, Spring 09)
Hanqiao Gao (UCSD MAE, 2008-2009)

Teaching Activities

Undergraduate Courses Taught

- MAE140:** Linear circuits (UCSD, Winter 09, Fall 09). Undergraduate course on steady-state and dynamic behavior of linear circuits, Kirchoff's laws, and design applications in engineering (4 credits)
- AMS27:** Mathematical Methods for Engineers (UCSC, Winter 05, Fall 05, Fall 06). Undergraduate course on linear algebra, differential equations and Laplace transform (5 credits)
- AMS27L:** Laboratory for Mathematical Methods for Engineers (UCSC, Winter 05, Fall 05, Fall 06). Undergraduate course on Matlab (2 credits)
- MATH11B:** Calculus with Applications (UCSC, Spring 06). Undergraduate course on integrals of functions, polynomial approximations and Taylor series (5 credits)

Graduate Courses Developed and Taught

- MAE207:** Hybrid Systems (UCSD, Fall 08). Graduate course on modeling, analysis, and design of hybrid dynamical systems, with emphasis on stability and applications (4 credits)
- MAE281B:** Nonlinear Control (UCSD, Spring 08, Spring 09, Spring 10). Graduate course on nonlinear control systems dealing with feedback stabilization and linearization, input-output stability, and passivity (4 credits)
- AMS214:** Applied Dynamical Systems (UCSC, Spring 07). Graduate course on dynamical systems and qualitative differential equations, stability, and applications (5 credits)
- AMS231:** Introduction to Nonlinear Control (UCSC, Spring 05, Winter 06). Graduate course on nonlinear systems and control (5 credits)
- AMS236:** Motion Coordination of Robotic Networks (UCSC, Fall 06). Graduate course on cooperative control, distributed algorithms and robotic networks (5 credits)

High School Courses Developed and Taught

- COSMOS:** Robot Automation: Intelligence through Feedback Control (UCSC, Summer 05, Summer 06). Course on feedback control and robotics in the California State School for Mathematics and Science (COSMOS) program for high school students

Short Courses and Participation in Summer/Winter Schools

Plenary Speaker, minicourse, 28th Benelux Meeting on Systems and Control, Spa, Belgium, Mar 2009 (3 hours)

Invited Speaker, Winter School on Olfactory Localization, UCSD Institute of Nonlinear Science, Jan 2009

Invited Lecturer, Cooperative multi-agent systems: distributed computation, estimation and control, Centro di Ricerca Matematica Ennio De Giorgi, Pisa, Italy, Dec 2007 (3 hours)

Invited Lecturer, Summer School on Geometric Mechanics and Control, International Center of Mathematical Meetings, Spain, Jun 2007 (6 hours)

Invited Advanced Topics Speaker, Summer School on Modeling and Control of Mechanical Systems, Dutch Institute for Systems and Control, Netherlands, Jul 2002

Publications

All manuscripts are available at <http://tintoretto.ucsd.edu/jorge>. Manuscripts are listed in inverse chronological order.

Journal Papers

- (J-51) J. Cortés. Cooperative detection of areas of rapid change in spatial fields. *Automatica*, 2009. Submitted
- (J-50) B. Gharesifard and J. Cortés. Distributed strategies for generating weight-balanced and doubly stochastic digraphs. *SIAM Journal on Control and Optimization*, 2009. Submitted
- (J-49) R. Graham and J. Cortés. Cooperative adaptive sampling of random fields with partially known covariance. *International Journal on Robust and Nonlinear Control*, 2009. Submitted
- (J-48) S. Martínez, J. Cortés, and F. Bullo. A catalog of inverse-kinematics planners for underactuated systems on matrix groups. *Journal of Geometric Mechanics*, 2009. To appear
- (J-47) M. D. Schuresko and J. Cortés. Distributed tree rearrangements for reachability and robust connectivity. *SIAM Journal on Control and Optimization*, 2009. Submitted
- (J-46) J. Feala, J. Cortés, P. Duxbury, C. Piermarocchi, A. McCulloch, and G. Paternostro. Systems approaches and algorithms for discovery of combinatorial therapies. *Wiley Interdisciplinary Reviews: Systems Biology and Medicine*, 2009. Accepted. To appear
- (J-45) J. Cortés. Global and robust formation-shape stabilization of relative sensing networks. *Automatica*, 45:2754–2762, 2009
- (J-44) J. Cortés and F. Bullo. Nonsmooth coordination and geometric optimization via distributed dynamical systems. *SIAM Review*, 51(1):163–189, 2009
- (J-43) J. Cortés. Coverage optimization and spatial load balancing by robotic sensor networks. *IEEE Transactions on Automatic Control*, 55(4), 2010. To appear
- (J-42) M. D. Schuresko and J. Cortés. Distributed motion constraints for algebraic connectivity of robotic networks. *Journal of Intelligent and Robotic Systems*, 56(1-2):99–126, 2009
- (J-41) K. Laventall and J. Cortés. Coverage control by robotic networks with limited-range anisotropic sensory. *International Journal of Control*, 82(6):1113–1121, 2009
- (J-40) R. Graham and J. Cortés. Asymptotic optimality of multicenter Voronoi configurations for random field estimation. *IEEE Transactions on Automatic Control*, 54(1):153–158, 2009
- (J-39) J. Cortés. Distributed Kriged Kalman filter for spatial estimation. *IEEE Transactions on Automatic Control*, 54(12):2816–2827, 2009

- (J-38) F. Benbadis, K. Obraczka, J. Cortés, and A. Brandwajn. Exploring landmark placement strategies for topology-based localization in wireless sensor networks. *EURASIP Journal on Advances in Signal Processing*, 2008. Special Issue on Signal Processing for Location Estimation and Tracking in Wireless Environments. Article ID 275658
- (J-37) J. Cortés. Discontinuous dynamical systems - a tutorial on solutions, nonsmooth analysis, and stability. *IEEE Control Systems Magazine*, 28(3):36–73, 2008
- (J-36) A. Ganguli, J. Cortés, and F. Bullo. Multirobot rendezvous with visibility sensors in nonconvex environments. *IEEE Transactions on Robotics*, 25(2):340–352, 2009
- (J-35) J. Cortés. Distributed algorithms for reaching consensus on general functions. *Automatica*, 44(3):726–737, 2008
- (J-34) C. Gao, J. Cortés, and F. Bullo. Notes on averaging over acyclic digraphs and discrete coverage control. *Automatica*, 44(8):2120–2127, 2008
- (J-33) J. Cortés and W. B. Dunbar. A high school-level course in feedback control: a Matlab-based introduction requiring only algebra and trigonometry. *IEEE Control Systems Magazine*, 27(3):79–89, 2007
- (J-32) S. Martínez, J. Cortés, and F. Bullo. Motion coordination with distributed information. *IEEE Control Systems Magazine*, 27(4):75–88, 2007
- (J-31) J. Cortés, M. de León, J. C. Marrero, and E. Martínez. Nonholonomic Lagrangian systems on Lie algebroids. *Discrete and Continuous Dynamical Systems - Series A*, 24(2):213–271, 2009
- (J-30) J. Cortés, M. de León, J. C. Marrero, D. Martín de Diego, and E. Martínez. A survey on Lagrangian mechanics and control on Lie algebroids and Lie groupoids. *International Journal of Geometric Methods in Modern Physics*, 3(3):509–558, 2006
- (J-29) J. Cortés. Finite-time convergent gradient flows with applications to network consensus. *Automatica*, 42(11):1993–2000, 2006
- (J-28) S. Martínez, F. Bullo, J. Cortés, and E. Frazzoli. On synchronous robotic networks – Part II: Time complexity of rendezvous and deployment algorithms. *IEEE Transactions on Automatic Control*, 52(12):2214–2226, 2007
- (J-27) S. Martínez, F. Bullo, J. Cortés, and E. Frazzoli. On synchronous robotic networks – Part I: Models, tasks and complexity. *IEEE Transactions on Automatic Control*, 52(12):2199–2213, 2007
- (J-26) A. Ganguli, J. Cortés, and F. Bullo. Maximizing visibility in nonconvex polygons: Nonsmooth analysis and gradient algorithm design. *SIAM Journal on Control and Optimization*, 45(5):1657–1679, 2006
- (J-25) J. Cortés, S. Martínez, and F. Bullo. Robust rendezvous for mobile autonomous agents via proximity graphs in arbitrary dimensions. *IEEE Transactions on Automatic Control*, 51(8):1289–1298, 2006
- (J-24) J. Cortés, S. Martínez, and F. Bullo. Spatially-distributed coverage optimization and control with limited-range interactions. *ESAIM. Control, Optimisation & Calculus of Variations*, 11(4):691–719, 2005
- (J-23) J. Cortés and A. Vinogradov. Hamiltonian theory of constrained impulsive motion. *Journal of Mathematical Physics*, 47:042905 (1–30), 2006
- (J-22) J. Cortés and E. Martínez. Mechanical control systems on Lie algebroids. *IMA Journal on Mathematical Control and Information*, 21(4):457–492, 2004
- (J-21) J. Cortés and F. Bullo. Coordination and geometric optimization via distributed dynamical systems. *SIAM Journal on Control and Optimization*, 44(5):1543–1574, 2005

- (J-20) J. Cortés, A. J. van der Schaft, and P. E. Crouch. Characterization of gradient control systems. *SIAM Journal on Control and Optimization*, 44(4):1192–1214, 2005
- (J-19) J. Cortés, S. Martínez, T. Karatas, and F. Bullo. Coverage control for mobile sensing networks. *IEEE Transactions on Robotics and Automation*, 20(2):243–255, 2004
- (J-18) M de León, J. Cortés, D. Martín de Diego, and S. Martínez. General symmetries in optimal control. *Reports on Mathematical Physics*, 53(1):55–78, 2004
- (J-17) J. Cortés. Energy conserving nonholonomic integrators. *Discrete and Continuous Dynamical Systems - Series A*, pages 189–199, 2003. Added volume
- (J-16) J. Cortés and S. Martínez. The consistency problem in optimal control: the degenerate case. *Reports on Mathematical Physics*, 51(2/3):171–186, 2003
- (J-15) S. Martínez, J. Cortés, and F. Bullo. Analysis and design of oscillatory control systems. *IEEE Transactions on Automatic Control*, 48(7):1164–1177, 2003
- (J-14) J. Cortés and S. Martínez. Configuration controllability for mechanical systems underactuated by one control. *SIAM Journal on Control and Optimization*, 41(6):1901–1921, 2003
- (J-13) J. Cortés, M de León, D. Martín de Diego, and S. Martínez. Geometric description of vakonomic and nonholonomic dynamics, comparison of solutions. *SIAM Journal on Control and Optimization*, 41(5):1389–1412, 2003
- (J-12) S. Martínez and J. Cortés. Motion control algorithms for simple mechanical systems with symmetry. *Acta Applicandae Mathematicae*, 76(3):221–264, 2003
- (J-11) F. Cantrijn and J. Cortés. Cosymplectic reduction of constrained systems with symmetry. *Reports on Mathematical Physics*, 49(2-3):167–182, 2002
- (J-10) J. Cortés, S. Martínez, and F. Bullo. On nonlinear controllability and series expansions for Lagrangian systems with dissipative forces. *IEEE Transactions on Automatic Control*, 47(8):1396–1401, 2002
- (J-9) J. Cortés, S. Martínez, and F. Cantrijn. Skinner-Rusk approach to time-dependent mechanics. *Phys. Lett. A*, 300(2-3):250–258, 2002
- (J-8) J. Cortés, S. Martínez, J. P. Ostrowski, and H. Zhang. Simple mechanical control systems with constraints and symmetry. *SIAM Journal on Control and Optimization*, 41(3):851–874, 2002
- (J-7) F. Cantrijn, J. Cortés, M. de León, and D. Martín de Diego. On the geometry of generalized Chaplygin systems. *Mathematical Proceedings of the Cambridge Philosophical Society*, 132:323–351, 2002
- (J-6) J. Cortés, S. Martínez, J. P. Ostrowski, and K. A. McIsaac. Optimal gaits for dynamic robotic locomotion. *International Journal of Robotics Research*, 20(9):707–728, 2001
- (J-5) J. Cortés and S. Martínez. Non-holonomic integrators. *Nonlinearity*, 14(5):1365–1392, 2001
- (J-4) S. Martínez, J. Cortés, and M. de León. Symmetries in vakonomic dynamics: applications to optimal control. *Journal of Geometry and Physics*, 38(3-4):343–365, 2001
- (J-3) J. Cortés, M. de León, D. Martín de Diego, and S. Martínez. Mechanical systems subjected to generalized non-holonomic constraints. *Royal Society of London. Proceedings Series A: Mathematical, Physical and Engineering Sciences*, 457(2007):651–670, 2001
- (J-2) S. Martínez, J. Cortés, and M. de León. The geometrical theory of constraints applied to the dynamics of vakonomic mechanical systems: the vakonomic bracket. *Journal of Mathematical Physics*, 41(4):2090–2120, 2000

- (J-1) J. Cortés and M. de León. Reduction and reconstruction of the dynamics of nonholonomic systems. *Journal of Physics A: Mathematical and General*, 32(49):8615–8645, 1999

Books

- (B-2) F. Bullo, J. Cortés, and S. Martínez. *Distributed Control of Robotic Networks*. Applied Mathematics Series. Princeton University Press, 2009. Electronically available at <http://coordinationbook.info>
- (B-1) J. Cortés. *Geometric, Control and Numerical Aspects of Nonholonomic Systems*, volume 1793 of *Lecture Notes in Mathematics*. Springer, New York, 2002

Book Chapters

- (BC-10) M. D. Schuresko and J. Cortés. Distributed tree rearrangements for reachability and robust connectivity. In R. Majumdar and P. Tabuada, editors, *International Conference on Hybrid Systems: Computation and Control*, volume 5469 of *Lecture Notes in Computer Science*, pages 470–474, New York, 2009. Springer
- (BC-9) J. Cortés. Distributed wombling by robotic sensor networks. In R. Majumdar and P. Tabuada, editors, *International Conference on Hybrid Systems: Computation and Control*, volume 5469 of *Lecture Notes in Computer Science*, pages 120–134, New York, 2009. Springer
- (BC-8) F. Bullo, J. Cortés, and S. Martínez. Distributed algorithms for robotic networks. In R. A. Meyers, editor, *Encyclopedia of Complexity and System Science*. Springer, New York, 2009. Entry 00168
- (BC-7) A. Ganguli, J. Cortés, and F. Bullo. Distributed coverage of nonconvex environments. In V. Saligrama, editor, *Networked Sensing Information and Control (Proceedings of the NSF Workshop on Future Directions in Systems Research for Networked Sensing, May 2006, Boston, MA)*, *Lecture Notes in Control and Information Sciences*, pages 289–305. Springer, 2007
- (BC-6) S. Martínez and J. Cortés. Matemáticas, Control y Robótica. In M. de León, J. L. González, L. A. Ibort, and E. Zuazua, editors, *Matemáticas en la Frontera*, pages 116–123. Comunidad de Madrid, Consejería de Educación, Madrid, Spain, 2007
- (BC-5) J. Cortés. Motion coordination algorithms resulting from classical geometric optimization problems. In K. Tas, D. Krupka, D. Baleanu, and O. Krupkova, editors, *Proceedings of the International Workshop on Global Analysis*, volume 729 of *AIP Conference Proceedings Series*, pages 54–68. American Institute of Physics, New York, 2004
- (BC-4) F. Bullo and J. Cortés. Adaptive and distributed coordination algorithms for mobile sensing networks. In V. Kumar, N. E. Leonard, and A. S. Morse, editors, *Cooperative control. (Proceedings of the 2003 Block Island Workshop on Cooperative Control)*, volume 309 of *Lecture Notes in Control and Information Sciences*, pages 43–62. Springer, New York, 2004
- (BC-3) S. Martínez, J. Cortés, and F. Bullo. Motion planning and control problems for underactuated robots. In A. Bicchi, H. Christensen, and D. Prattichizzo, editors, *Control Problems in Robotics*, volume 4 of *Springer Tracts in Advanced Robotics*, pages 59–74. Springer, New York, 2003
- (BC-2) F. Bullo, J. Cortés, A.D. Lewis, and S. Martínez. Vector-valued quadratic forms in control theory. In V. Blondel and A. Megretski, editors, *Unsolved Problems in Mathematical Systems and Control Theory*, pages 315–320. Princeton University Press, Princeton, 2004
- (BC-1) M. de León, J. Cortés, D. Martín de Diego, and S. Martínez. An introduction to mechanics with symmetry. In *Recent advances in Lie theory (Vigo, 2000)*, volume 25 of *Res. Exp. Math.*, pages 305–332. Heldermann, Lemgo, 2002

Conference Proceedings

- (C-48) R. Aragüés, J. Cortés, and C. Sagüés. Dynamic consensus for merging visual maps under limited communications. In *IEEE Int. Conf. on Robotics and Automation*, Anchorage, AL, May 2010. To appear
- (C-47) B. Gharesifard and J. Cortés. When does a digraph admit a doubly stochastic adjacency matrix? In *American Control Conference*, Baltimore, MD, June 2010. Submitted
- (C-46) R. Graham and J. Cortés. Spatial statistics and distributed estimation by robotic sensor networks. In *American Control Conference*, Baltimore, MD, June 2010. Submitted
- (C-45) B. Gharesifard and J. Cortés. Distributed strategies for making a digraph weight-balanced. In *Allerton Conf. on Communications, Control and Computing*, Monticello, IL, October 2009
- (C-44) H. Gao and J. Cortés. Spatial detection of areas of abrupt change by robotic networks. In *ASME Dynamic Systems and Control Conference*, Hollywood, California, October 2009. DSCC2009-2760
- (C-43) R. Graham and J. Cortés. Cooperative adaptive sampling via approximate entropy maximization. In *IEEE Conf. on Decision and Control*, Shanghai, China, December 2009. To appear
- (C-42) R. Aragüés, J. Cortés, and C. Sagüés. Motion control strategies for improved multi robot perception. In *IEEE/RSJ Int. Conf. on Intelligent Robots & Systems*, pages 1065–1070, St. Louis, MI, October 2009
- (C-41) R. Graham and J. Cortés. Cooperative adaptive sampling of random fields with unknown covariance. In *American Control Conference*, St. Louis, MI, 2009. 4543-4548
- (C-40) J. Cortés. Global formation-shape stabilization of relative sensing networks. In *American Control Conference*, St. Louis, MI, 2009. 1460-1465
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