Aykut Cihan Satici

Personal Data

Place and Date of Birth:	Istanbul, Turkey — 05 August 1985
Address:	928 Dorchester Avenue, Apt. 9, 02125, Dorchester, MA, USA
Phone:	+1-857-309-8224
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Research Interests

1. Geometric mechanics and (mathematical) control theory of (underactuated) mechanical systems
2. Multi-agent robotic systems and cooperative manipulation
3. Control of robots in contact with the environment and/or humans

Education

May 17, 2014 — Doctor of Philosophy in Electrical Engineering
The University of Texas at Dallas, Richardson, TX, USA
Concentration: Robotics, Control, Multi-Agent Systems, Geometric Mechanics
Dissertation title: "Cooperative Manipulation, Swarming and Connectivity Control of Multi-Agent Mechanical Systems"
Advisor: Prof. Mark W. Spong
Committee: Prof. Mark W. Spong (Chair), Prof. Nicholas R. Gans, Prof. Viswanath Ramakrishna, Prof. Mathukumalli Vidyasagar
Gpa: 4.0/4.0

December 28, 2013 — Master of Science in Mathematical Sciences
The University of Texas at Dallas, Richardson, TX, USA
Concentration: (Functional) Analysis, Differential Geometry
Advisor: Prof. Viswanath Ramakrishna
Gpa: 4.0/4.0

June 2010 — Master of Science in Mechatronics Engineering
Sabanci University, Istanbul, Turkey
Concentration: Robotics, Control, Parallel Mechanisms
Thesis title: "Modeling, Implementation and Control of a Forearm-Wrist Rehabilitation Device"
Advisor: Prof. Volkan Patoglu
Committee: Prof. Volkan Patoglu, Prof. Mustafa Unel, Prof. Kemalettin Erbatur, Prof. Erhan Budak
Gpa: 3.9/4.0

June 2008 — Bachelor of Science in Mechatronics Engineering
Sabanci University, Istanbul, Turkey
Concentration: Mechanical Systems, Control
Graduation project: "Topology Optimization of SuSolar (Solar Car)"
Advisor: Prof. Gullu Kiziltas
Gpa: 3.4/4.0

Work Experience

July 2014 - March 2015	Application Support Engineer at The MathWorks, Inc. Developing a MATLAB-based Robot Simulator: Incorporation of robot size in collision detection, Improving laser scanner simulation, Simulated sensor and odometry noise

Research Experience

April 2016 - *Current*	Postdoctoral researcher at Massachusetts Institute of Technology Member of Robot Locomotion Group Mentor: Russell L. Tedrake
☐	Hybrid Control of Underactuated Mechanical Systems
☐	Tractable Analysis and Control of Soft Robotics using Implicit Surface Models
May 2015 - March 2016	Postdoctoral researcher at The University of Naples, Federico II Member of Prisma Laboratory working on the RoDyMan Project Mentor: Bruno Siciliano
☐	Nonprehensile Dynamic Manipulation
☐	Energy-Based Control of Robotic Systems
☐	Tossing and Catching of a Pizza Dough with a Robotic Manipulator
☐	Trajectory Planning for a Ping-Pong Playing Robot
☐	Dynamics and Control of the Ballbot
Aug 2010 - May 2014	Doctoral Research at The University of Texas at Dallas Laboratory for Autonomous Robotics and Systems Advisor: Mark W. Spong
☐	Connectivity Preserving Formation Control
☐	Geometric Reduction Theory Applied to Multi-Agent Systems
☐	Formation Control with Vision-Based Position Measurements
☐	Nonholonomic Cooperative Manipulation of Polygonal Objects
☐	Path-Following Control via Sensor-Fused Visual Homography
☐	Linear Optimal Robust Control Theory Applied to UAVs
Sep 2008 - June 2010	Masters-Level Research at Sabanci University Human-Machine Interaction Laboratory Advisor: Volkan Patoglu
☐	Passive Velocity Field Control of Forearm-Wrist Exoskeleton
☐	Multiobjective Design Optimization of Parallel Mechanisms
☐	Characterization of Forearm-Wrist Exoskeleton
☐	Implementation of Forearm-Wrist Exoskeleton

Teaching Experience

Sept 2015	A short course on Geometric Mechanics
	Instructor: Dr. Aykut Cihan Satıcı
◊	Five 2-hour lectures
◊	Coordinate-free Lagrangian and Hamiltonian Mechanics
◊	Symmetries and Conservation Laws
◊	Derivation of Geometric Control Laws
Aug 2013 - May 2014	Teaching Assistant at The University of Texas at Dallas
SYSM 6302	Optimization Theory and Practice
	Instructor: Prof. James Primbs
MECH 6313	Nonlinear Control Systems
	Instructor: Prof. Mark W. Spong
◊	Grading homework, exams and projects
◊	Suggestions for the course material
Sep 2008 - June 2010	Teaching Assistant at Sabanci University
ME 303	Control System Design
	Instructor: Prof. Kemalettin Erbatur
EE 521	Kinematics and Dynamics of Mechanisms
	Instructor: Prof. Volkan Patoğlu
◊	Grading homework, exams and projects
◊	Suggestions for the course material
◊	Supervising laboratory work

List of Publications

Book Chapter

Volkan Patoglu and Aykut Cihan Satici, "*Optimal Design of Haptic Interfaces*", Advances in Haptics, IN-TECH, 2010. *(This book chapter has been downloaded over* 4000 *times from unique IP addresses.)*

Refereed Journal Articles

1. Aykut Cihan Satici, Alejandro Donaire, Bruno Siciliano, ,"*Intrinsic Dynamics and Total Energy Shaping Control of the Ballbot System*", International Journal of Control, *Accepted, to appear*, Nov 2016
2. Aykut C Satici, Mark W. Spong, "*Global Swarming With Connectivity Via Lagrange-Poincaré Equations,*", Automatica, Volume 71, September 2016
3. Ahmetcan Erdogan, Besir Celebi, Aykut C Satici, and Volkan Patoglu, "*A Reconfigurable Ankle Exoskeleton with Series-Elastic Actuation*", Springer Autonomous Robots, Assistive and Rehabilitation Robotics, (2015)
4. Hasan Alihusain Poonawala, Aykut C Satici, Hazen Eckert, and Mark W. Spong, "*Collision-Free Formation Control with Decentralized Connectivity Preservation for Nonholonomic-Wheeled*

Mobile Robots,", IEEE Transactions on Control of Network Systems, vol. 2, no. 2, pp.122-130, June, 2015

5. Aykut Cihan Satici, Hasan Poonawala, and Mark W. Spong "*Robust Optimal Control of Quadrotor UAVs,*", Access, IEEE, vol. 1, no., pp.79-93, 2013
6. David Tick, Aykut Cihan Satici, Jinglin Shen, and Nicholas Gans, "*Tracking Control of Mobile Robots Localized via Chained Fusion of Discrete and Continuous Epipolar Geometry, IMU and Odometry,*", IEEE Transactions on Cybernetics, vol.43, no.4, pp.1237-1250, Aug. 2013
7. Aykut Cihan Satici, Ahmetcan Erdogan, and Volkan Patoglu, "*A Multi-Lateral Rehabilitation System,*", Turkish Journal of Electrical Engineering and Computer Sciences, vol. 19(5), 2011. *(Selected for journal publication by conference PC members.)*

Refereed International Conference Proceedings

1. Aykut Cihan Satici, Robert Katzschmann, Daniela Rus, Russ Tedrake, "*Modeling and Control of a Soft Juggling Robot*", Robotics: Science and Systems (RSS) *in preparation*, July 2017
2. Diana Serra, Aykut Cihan Satici, Fabio Ruggiero, Vincenzo Lippiello and Bruno Siciliano, "*An Optimal Trajectory Planner for Robotic Batting Task: The Table Tennis Example*", 13th International Conference on Informatics in Control, Automation and Robotics, (ICINCO), 2016
3. Aykut Cihan Satici, Fabio Ruggiero, Vincenzo Lippiello and Bruno Siciliano, "*Intrinsic Euler-Lagrange Dynamics and Control Analysis of the Ballbot*", IEEE American Control Conference, (ACC), 2016
4. Aykut Cihan Satici, Fabio Ruggiero, Vincenzo Lippiello and Bruno Siciliano, "*A Coordinate-Free Framework for Robotic Pizza Tossing and Catching*", IEEE Conference on Robotics and Automation, (ICRA) 2016
5. Aykut Cihan Satici, and Mark W. Spong, "*Global Swarming While Preserving Connectivity via Lagrange-Poincaré Equations,*", World Congress of the International Federation of Automatic Control, (IFAC) 2014, 24-29 Aug 2014
6. Aykut Cihan Satici, Hasan Poonawala, Hazen Eckert, and Mark W. Spong, "*Connectivity preserving formation control with collision avoidance for nonholonomic wheeled mobile robots,*", IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2013, vol., no., pp.5080,5086, 3-7 Nov. 2013
7. Hasan Poonawala, Aykut Cihan Satici, and Mark W. Spong, "*Leader-follower formation control of nonholonomic wheeled mobile robots using only position measurements,*" 9th Asian Control Conference (ASCC), 2013, vol., no., pp.1,6, 23-26 June 2013
8. Aykut Cihan Satici, and Mark W. Spong, "*Connectivity control on Lie groups,*" 9th Asian Control Conference (ASCC), 2013, vol., no., pp.1,6, 23-26 June 2013
9. Aykut Cihan Satici, David Tick, Jinglin Shen, Nicholas Gans, "*Path-following control for mobile robots localized via sensor-fused visual homography,*" IEEE American Control Conference, (ACC), 2013, vol., no., pp.6287,6293, 17-19 June 2013
10. Aykut Cihan Satici, and Mark W. Spong, "*Nonholonomic cooperative manipulation of polygonal objects in the plane,*" IEEE 51st Annual Conference on Decision and Control (CDC), 2012, vol., no., pp.2439,2446, 10-13 Dec. 2012
11. Hasan Poonawala, Aykut Cihan Satici, Nicholas Gans, and Mark W. Spong, "*Formation control of wheeled robots with vision-based position measurement,*" American Control Conference (ACC), 2012, vol., no., pp.3173,3178, 27-29 June 2012

12. Ahmetcan Erdogan, Aykut Cihan Satici, and Volkan Patoglu, "*Passive velocity field control of a forearm-wrist rehabilitation robot,*" IEEE International Conference on Rehabilitation Robotics (ICORR), 2011, vol., no., pp.1,8, June 29 2011-July 1 2011
13. M. Alper Ergin, Aykut Cihan Satici, and Volkan Patoglu, "*Design optimization, impedance control and characterization of a Modified Delta Robot,*" 2011 IEEE International Conference on Mechatronics (ICM), , vol., no., pp.737,742, 13-15 April 2011
14. Aykut Cihan Satici, Ahmetcan Erdogan, and Volkan Patoglu, "*Design of a reconfigurable ankle rehabilitation robot and its use for the estimation of the ankle impedance,*" IEEE International Conference on Rehabilitation Robotics, 2009. ICORR 2009., vol., no., pp.257,264, 23-26 June 2009
15. Ahmetcan Erdogan, Aykut Cihan Satici, and Volkan Patoglu, "*Design of a reconfigurable force feedback ankle exoskeleton for physical therapy,*" ASME/IFToMM International Conference on Reconfigurable Mechanisms and Robots, 2009. ReMAR 2009., vol., no., pp.400,408, 22-24 June 2009

Professional Membership

2012-2015 Member of Institute of Electrical and Electronic Engineers (IEEE)

References

Professor Mark W. Spong mspong@utdallas.edu +1-972-883-2974	University of Texas at Dallas, Dean of Erik Jonsson School of Engineering and Computer Science, Lars Magnus Ericsson Chair in Electrical Engineering, Excellence in Education Chair
Professor Mathukumalli Vidyasagar m.vidyasagar@utdallas.edu +1-972-883-4679	University of Texas at Dallas, Erik Jonsson School of Engineering and Computer Science, Cecil and Ida Green Chair in Systems Biology Science
Professor Viswanath Ramakrishna vish@utdallas.edu +1-972-883-6873	University of Texas at Dallas, School of Natural Sciences and Mathematics
Professor Bruno Siciliano siciliano@unina.it +39-081-768-3179	Università degli Studi di Napoli Federico II, Dipartimento di Ingegneria Elettrica e Tecnologie dell'Informazione
Professor Russell L. Tedrake russt@mit.edu +1-617-253-1778	Massachusetts Institute of Technology, Electrical Engineering and Computer Science
Associate Professor Volkan Patoğlu vpatoglu@sabanciuniv.edu +90-216-483-9604	Sabanci University, Faculty of Engineering and Natural Sciences
Assistant Professor Nicholas R. Gans ngans@utdallas.edu +1-972-883-6755	University of Texas at Dallas, Erik Jonsson School of Engineering and Computer Science