

Curriculum Vitae

N. Harris McClamroch

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Education:

B.S. in Mechanical Engineering, The University of Texas, Austin, 1963.
M.S. in Mechanical Engineering, The University of Texas, Austin, 1965.
Ph.D. in Engineering Mechanics, The University of Texas, Austin, 1967.

Professional Experience:

Assistant Professor of Aerospace Engineering, 1967-71; The University of Michigan, Ann Arbor.
Associate Professor of Aerospace Engineering, 1971-77; The University of Michigan, Ann Arbor.
Professor of Aerospace Engineering and Electrical Engineering and Computer Science, 1977-2010; The University of Michigan, Ann Arbor.
Professor Emeritus of Aerospace Engineering and Electrical Engineering and Computer Science, 2010-present, The University of Michigan, Ann Arbor.

Chair, 1992-1996, Department of Aerospace Engineering, The University of Michigan, Ann Arbor.

Assistant Professor, 1968-71; Associate Professor, 1971-77; Professor, 1977-1983 in Program in Computer, Information and Control Engineering, The University of Michigan, Ann Arbor.

University of Michigan affiliations:

Program for Study of Complex Systems, 1992-2011.
Artificial Intelligence Laboratory, 1989-1993.
Center for Research in Integrated Manufacturing, 1982-1989.

Sabbatical leave: NASA Ames, NASA Langley, Twente University (Enschede, the Netherlands), University of Texas, Dallas, and other locations, January-May, 1996.

Sabbatical leave at Artificial Intelligence Laboratory, University of Michigan, Ann Arbor, MI, January-May, 1989.

Staff Member at C.S. Draper Laboratory, Cambridge, Mass., May-September, 1982.

Sabbatical leave at C.S. Draper Laboratory, Cambridge, Mass., January-May, 1982.

Research Engineer at Sandia Laboratories, Albuquerque, N.M., May-September, 1977.

Research Engineer at Technical University of Delft, The Netherlands, Control Engineering Laboratory, May-September, 1976.

Sabbatical leave at Control Engineering Department, Cambridge University, England, January-July, 1975.

Research Interests:

Linear and nonlinear control systems: optimization, stability, estimation, feedback; application of modeling, mathematical analysis and computational methods to problems involving control of mechanical systems, especially aircraft and spacecraft systems.

PhD Students

Ronald B. Zmood; 1971; Royal Melbourne Inst. of Tech., Melbourne, Australia

Chelsea C. White; 1974; Georgia Institute of Technology

James D. Blight; 1975; Boeing Aircraft

Daniel R. Hegg; 1976; Retired, C. S. Draper Laboratory

Myung Jin Chung (co-chair with C. S. G. Lee); 1983; Korea Advanced Institute of Science and Technology

Ahmed I. Iskanderani; 1984; King Abdulaziz University Jidda, Saudi Arabia

Han-Pang Huang; 1986; National Taiwan University

Charles J. Conrad; August, 1986; consultant, Ann Arbor, Michigan

Fung-Yuan Gou; 1988; Taiwan, ROC

Gurkirpal Singh (co-chair with P. T. Kabamba); 1988; Jet Propulsion Laboratory

Tao Guo (co-chair with N. Narasimhmurthi); 1989; Marietta, Ga.

Danwei Wang; 1989; National Technological Institute, Singapore

Chih-Ping Lee; 1989; United Postal Service

Chi-Chang Ho; 1991; Taiwan, ROC

Mahmut Reyhanoglu; 1992; Embry Riddle University

Hariharan Krishnan; 1992; General Motors Corporation

Liang-Boon Wee; 1992; Singapore

David LeBlanc; 1994; University of Michigan Transportation Research Institute

Darren Schumacher; 1994; SPX Corporation

Ilya Kolmanovsky; 1995; University of Michigan

Chunlei Rui; 1997; Boeing Defense and Space

Saif A. al-Hiddabi, 2000; Sultan Qaboos University, Oman

Sangbum Cho, 2001, Seoul National University, Korea

Jinglai Shen, 2002, University of Maryland, Baltimore County

Amit Sanyal, 2004, University of Hawaii

Nalin Chaturvedi, 2007, Robert Bosch, L.L.C.

Taeyoung Lee, 2008, George Washington University

Professional Activities:

Associate Editor for Technical Notes and Correspondence of IEEE Transactions on Automatic Control, 1985-1989.

Editor of IEEE Transactions on Automatic Control, 1989-1992.

Chair, Editorial Board of IEEE Transactions on Automatic Control, 1989-1992.

Editorial Boards:

Journal of Nonlinear Science, 2009-2011.

SIAM Book Series in Advances in Design and Control, 1998-2003.

IEEE Transactions on Automatic Control

Editor for Technical Notes, 1985-1992.

Associate Editor at Large, 1999-2006.

Journal of Dynamical and Control Systems, 1994-2000.

IEEE Transactions on Robotics and Automation, 1993.

Special Issue Editor (with B. Sridhar); "Air Traffic Control," IEEE Transactions on Intelligent Transportation Systems,

Part I, Vol. 1, No. 4, December, 2000,

Part II, Vol. 2, No. 2, June, 2001.

Member of Board of Governors of IEEE Control Systems Society, 1988-1999.

Member of Executive Committee of IEEE Control Systems Society,
1989-1992; 1994-1999.

IEEE Control Systems Society Officer

Vice President, Publications, 1994

Vice President, Finance, 1995, 1996.

President-Elect, 1997.

President, 1998.

Chair, Awards Committee, 2001.

Chair, IEEE Fellows Evaluation Committee, 2002-2004

IEEE Technical Activities Board, 1998.

IEEE Systems Council Administrative Committee, 2007-2009

Conference and Workshop Organization

Program Committees

IEEE Conference on Decision and Control
American Control Conference
AIAA Guidance, Navigation and Control Conference
SIAM Conference on Control Theory and its Applications
Conference on Control, Automation, Robotics and Vision.

Program Chairman, 1994 IEEE Conference on Decision and Control,
Orlando, FL.

General Chair, 1999 IEEE Conference on Control Applications, Hawaii.

Organizing Committee, NSF/CSS Workshop on New Directions in Control
Engineering Education, 1999, University of Illinois.

Organizing Committee, Workshop for High School Teachers of Mathematics
and Science: Ideas and Technology of Control and Systems, NSF, 2000,
Chicago.

Organizer of numerous invited sessions at professional conferences
IEEE Conference on Decision and Control
American Control Conference
AIAA Guidance, Navigation and Control Conference
SIAM Conference on Control and Systems Theory.

Consultant to Mathematical Reviews.

National Science Foundation Panels
Presidential Young Investigator Awards, Engineering Systems, 1989
Research Initiation Awards, Mechanical Systems, 1990
Intelligent Control Panel, 1992
Earthquake Control Panel, 1993
Research-Curriculum Development Panel, 1994
Learning and Intelligent Systems Panel, 1997
Controls, Networks and Computational Intelligence Panel, 2001
Panel, 2003
Career Panel, 2006

Professional consultant to industrial corporations.

Membership in Professional Societies:

Institute of Electrical and Electronics Engineers

Control Systems Society
Systems, Man and Cybernetics Society
Robotics and Automation Society
Neural Networks Council
American Institute of Aeronautics and Astronautics
Society for Industrial and Applied Mathematics
American Association for the Advancement of Science

Honors and Awards:

Pi Tau Sigma.

Tau Beta Pi.

University of Michigan Distinguished Service Award, 1970.

Fellow of the IEEE "for contributions to the theory of stability and control of nonlinear feedback systems," 1988.

Distinguished Member Award, IEEE Control Systems Society, 1992.
Service Award, Department of Aerospace Engineering, The University of Michigan, 1996.

IEEE Third Millennium Medal, 2000

HarrisFest 2002: a research symposium in honor of 60th birthday, October 18, 2002

Plenary Address at the IEEE International Conference on Control Applications on "Pendulum Dynamics and Control Problems: The Planar Pendulum, the Spherical Pendulum, and the 3D Pendulum," Toronto, 2005.

Department of Aerospace Engineering Award, 2008

HarrisFest 2010: a research symposium in honor of UM retirement, May 22, 2010

University of Michigan Activities:

Administrative Responsibilities:

Acting Chair, Program in Computer, Information and Control Engineering,
Winter term, 1979.

Chair, College of Engineering Curriculum Committee, 1980-1981.

Chair, Curriculum Committee of (graduate) Program in Computer, Information and Control Engineering and (undergraduate) Computer Engineering program, 1973 -1977, 1983-84.

Chair, Senate Advisory Committee on University Affairs, 1987-88.

Chair, Department of Aerospace Engineering, January, 1992-December, 1995.

Departmental Activities:

Graduate program advisor in Program in Computer, Information and Control Engineering, 1970-1984.

Program Committee for Program in Computer, Information and Control Engineering, 1979-1982.

Graduate program advisor in Department of Aerospace Engineering, 1984-1991.

Chair, Graduate Committee in Department of Aerospace Engineering, 1988-1990.

Chair, Undergraduate Committee in Department of Aerospace Engineering, 2004-2008.

College of Engineering Activities:

College of Engineering Curriculum Committee, 1978-1981.

College of Engineering Executive Committee: 1989-1991.

University Activities:

Research Policies Committee, 1979-1982
Chair, subcommittee on Status of Research Scientists.

Rackham Graduate School Divisional Board, 1982-1985.

Senate Assembly, 1983-1987.

Committee on Economic Status of the Faculty (CESF), 1983-1985
Chair, subcommittee on Health Benefits.

Senate Advisory Committee on University Affairs: the Executive Committee of the University of Michigan faculty governance system, 1985-1988

Financial Affairs Committee, 1985-1986

Academic Affairs Advisory Committee, 1985-1986

Budget Priorities Committee, 1986-1987

Computer Policies Committee, 1986-1987

Information Technology Policy Committee, 1987-1989

Tenure Issues Liaison Group, 1986-1988

Presidential Committee on the Athletic Department, 1987.

Chair, SACUA, 1987-1988

University Executive Officers meetings, 1987-1988

Academic Affairs Advisory Council, 1987-1988

Provost's Strategic Planning Group, 1987-1988.

President's Task Force on Safety and Security, 1989-1990.

Co-Chair of Provost's Academic Working Group on Information Technology, 1991-1992.

Alumni Association Board of Governors, faculty representative, 1990-1993.

Rackham Executive Board, 1992-1993.

Executive Committee of Program for Study of Complex Systems, 1993-2000.

Executive Committee, UM Transportation Research Institute, 1997-2001.

Task Force on Safety and Security, 1996-1997.

University of Michigan Transportation Research Institute Director Search Committee, 1998-1999.

Chair, Review Committee for Center for Study of Complex Systems, 2001.

Books published

N. H. McClamroch, *State Models of Dynamic Systems: A Case Study Approach*, Springer-Verlag, New York, 1980, 248 pages.

N. H. McClamroch, *Steady Aircraft Flight and Performance*, Princeton University Press, 2011, 415 pages.

Publications (Journals):

N. H. McClamroch, "A Result on the Performance Deterioration of Optimum Systems," IEEE Trans. on Automatic Control, AC-12, 1967, 209-210.

N. H. McClamroch and J. K. Aggarwal, "On Equivalent Systems in Optimal Control and Stability Theory," IEEE Trans. on Automatic Control, AC-12, 1967, 303.

N. H. McClamroch, J. K. Aggarwal, and L. G. Clark, "On Parameter Invariance in Linear Control Systems," International J. of Control, 5, 1967, 361-367.

W. L. Garrard, N. H. McClamroch, and L. G. Clark, "An Approach to Suboptimal Feedback Control of Nonlinear Systems," International J. of Control, 5, 1967, 425-435.

J. A. Walker and N. H. McClamroch, "Finite Regions of Attraction for the Problem of Lur'e," International J. Control, 6, 1967, 331-336.

N. H. McClamroch and J. K. Aggarwal, "On the Existence of Upper Bounds on the Performance Index of Nonlinear Systems," J. of the Franklin Institute, 285, 1968, 483-487.

J. A. Walker and N. H. McClamroch, "Finite Regions of Attraction for Feedback Systems Containing a Single Time-Varying Nonlinearity," IEEE Trans. on Automatic Control, AC-13, 1968, 587.

N. H. McClamroch and J. K. Aggarwal, "On the Convergence of an Improper Integral Evaluated along the Solution of a Differential Equation," J. Mathematical Analysis and Applications, 24, 1968, 608-612.

N. H. McClamroch, "Duality and Bounds for the Matrix Riccati Equation," J. Mathematical Analysis and Applications, 25, 1969, 622-627.

N. H. McClamroch, L. G. Clark and J. K. Aggarwal, "Sensitivity of Linear Control Systems to Large Parameter Variations," Automatica, 5, 1969, 257-263.

N. H. McClamroch, "Evaluation and Suboptimality and Sensitivity in Control and Filtering Processes," IEEE Trans. on Automatic Control, AC-14, 1969, 282-285.

N. H. McClamroch, "A Sufficiency Condition for Discrete Time Optimal Processes," International J. of Control, 12, 1970, 157-161.

N. H. McClamroch, J. K. Aggarwal and H. T. Banks, "Invariance in Linear Systems," *J. Mathematical Analysis and Applications*, 29, 1970, 498-506.

N. H. McClamroch, "A General Adjoint Relation for Functional Differential and Volterra Integral Equations with Application to Control," *J. of Optimization Theory and Applications*, 5, 1971, 346-356.

R. B. Zmood and N. H. McClamroch, "On Pointwise Completeness of Differential-Difference Equations," *J. of Differential Equations*, 12, 1972, 255-280.

N. H. McClamroch, "Functional Differential Equations and Age Dependent Population Growth," *Mathematical Biosciences*, 14, 1972, 255-280.

N. H. McClamroch and G. D. Iancelescu, "Conditions of Global Stability of Two Linearly Interconnected Nonlinear Systems," *IEEE Trans. on Automatic Control*, AC-20, 1975, 678-682.

N. H. McClamroch, "A Representation for Multivariable Feedback Systems and its Use in Stability Analysis. Part I: Linear Systems," *International J. Control*, 24, 1976, 83-95.

N. H. McClamroch, "A Representation for Multivariable Feedback Systems and its Use in Stability Analysis. Part II: Nonlinear Systems," *International J. Control*, 24, 1976, 97-107.

N. H. McClamroch, "Some Input-Output Properties of Nonlinear Multivariable Feedback Systems," *IEEE Trans. on Automatic Control*, AC-21, 1976, 567-572.

J. D. Blight and N. H. McClamroch, "Graphical Stability Criteria for Large Scale Nonlinear Multi-loop Systems," *Automatica*, 13, 1977, 189-192.

N. H. McClamroch, "Comments on 'Global Stability of Two Linearly Interconnected Nonlinear Systems'," *IEEE Trans. on Automatic Control*, AC-24, 1979, 673.

N. H. McClamroch, "Control of a Linear Sampled Data System using Round Robin Output Feedback," *IEEE Trans. on Automatic Control*, AC-25, 1980, 298-299.

D. R. Hegg and N. H. McClamroch, "Necessary Conditions for Optimization in Multiparameter Discrete Systems," *J. of Optimization Theory and Applications*, 41, 1983, 107-122.

N. H. McClamroch, "Sampled Data Control of Flexible Structures using Constant Gain Velocity Feedback," *AIAA J. of Guidance, Control and Dynamics*, 7, 1984, 747-750.

N. H. McClamroch, "Displacement Control of Flexible Structures using Electrohydraulic Servo Actuators," *ASME J. of Dynamic Systems, Measurement and Control*, 107, 1985, 34-39.

A. I. Iskanderani and N. H. McClamroch, "Signal Estimation for Second Order Vector Difference Equations," *IEEE Trans. on Automatic Control*, AC-30, 1985, 771-773.

C. J. Conrad and N. H. McClamroch, "The Drilling Problem: A Stochastic Modeling and Control Example in Manufacturing," *IEEE Trans. on Automatic Control*, AC-32, November, 1987, 947-958.

H. P. Huang and N. H. McClamroch, "Time Optimal Control for a Robotic Contour Following Problem," *IEEE Journal on Robotics and Automation*, Vol. 4, No. 2, April, 1988, 140-149.

N. H. McClamroch and D. Wang, "Feedback Stabilization and Tracking of Constrained Robots," *IEEE Trans. on Automatic Control*, AC-33, May, 1988, 419-426.

G. Singh, P. T. Kabamba and N. H. McClamroch, "Planar Time Optimal, Rest to Rest, Slewing Maneuvers," *AIAA Journal of Guidance, Control, and Dynamics*, Vol. 12, No. 1, Jan-Feb, 1989, 71-81.

G. Singh, P. T. Kabamba and N. H. McClamroch, "Time-Optimal Spinup Maneuvers of Flexible Spacecraft," *Journal of the Astronautical Sciences*, 1990.

G. Singh, P. T. Kabamba and N. H. McClamroch, "Bang-Bang Control of Flexible Spacecraft Slewing Maneuvers: Guaranteed Terminal Pointing Accuracy," *AIAA Journal of Guidance, Control and Dynamics*, 1990, 376-379.

N. H. McClamroch, "Feedback Stabilization of Control Systems Described by a Class of Nonlinear Differential-Algebraic Equations," *Systems and Control Letters*, 15, 1990, 53-60.

N. H. McClamroch and D. Wang, "Linear Feedback Control of Position and Contact Force for a Nonlinear Constrained Mechanism," *Transactions of the ASME, Journal of Dynamic Systems, Measurement and Control*, Vol. 112, December, 1990, 640-645.

H. Krishnan and N. H. McClamroch, "Computation of State Realizations for Control Systems Described by a Class of Linear Differential-Algebraic Equations," *International Journal on Control*, 55, 1992, 1425-1441.

H. Krishnan and N. H. McClamroch, "Nonstandard Singularly Perturbed Control Systems and Differential-Algebraic Equations," *International Journal on Control*, 55, 1992, 1239-1253.

A. M. Bloch, M. Reyhanoglu and N. H. McClamroch, "Control and Stabilization of Nonholonomic Dynamic Systems," *IEEE Transactions on Automatic Control*, Vol. 37, No. 11, 1992, 1746-1757.

M. Reyhanoglu and N. H. McClamroch, "Reorientation Maneuvers of Planar Multibody Systems in Space using Internal Controls," *AIAA Journal of Guidance, Control and Dynamics*, Vol. 15, No. 6, 1992, 1475-1480.

C. C. J. Ho and N. H. McClamroch, "Automatic Spacecraft Docking using Computer Vision Based Guidance and Control Techniques," *AIAA Journal of Guidance, Control and Dynamics*, Vol. 16, March-April, 1993, 281-288.

D. Wang and N. H. McClamroch, "Position and Force Control for Constrained Manipulator Motion: Lyapunov's Direct Method," *IEEE Transactions on Robotics and Automation*, Vol. 9, No. 3, June, 1993, 308-313.

H. Krishnan and N. H. McClamroch, "On the Connection Between Nonlinear Differential-Equations and Singularly Perturbed Control Systems," *IEEE Transactions on Automatic Control*, Vol. 39, No. 5, May, 1994, 1079-1084.

H. Krishnan, N. H. McClamroch, and M. Reyhanoglu, "Attitude Stabilization of a Rigid Spacecraft using Two Control Torques: A Nonlinear Control Approach Based on the Spacecraft Attitude Dynamics," *Automatica*, Vol. 30, No. 6, June, 1994, 1023-1027.

H. Krishnan and N. H. McClamroch, "Tracking in Nonlinear Differential-Algebraic Control Systems with Applications to Constrained Robot Systems," *Automatica*, Vol. 30, No. 12, December, 1994, 1885-1897.

D. Wang and N. H. McClamroch, "Stability Analysis of the Equilibrium of a Constrained Mechanical System," *International Journal of Control*, Vol. 60, No. 5, November, 1994, 733-746.

H. Krishnan and N. H. McClamroch, "Attitude Stabilization of a Rigid Spacecraft using Two Momentum Wheel Actuators," *AIAA Journal of Guidance, Control and Dynamics*, March-April, 1995, Volume 18, 256-263.

I. Kolmanovsky and N. H. McClamroch, "Developments in Nonholonomic Control Problems," *Control Systems Magazine*, Vol. 15, December, 1995, 20-36.

M. Reyhanoglu, A. M. Bloch, and N. H. McClamroch, "Control of Nonholonomic Systems with Extended Base Space Dynamics," *International Journal of Robust and Nonlinear Control*, 15, 1995, 325-330.

I. Kolmanovsky and N. H. McClamroch, "Stabilizing Feedback Laws for Internally Actuated Multibody Systems in Space," *Nonlinear Analysis: Theory, Methods and Applications*, 26, 1996, 1461-1479.

I. Kolmanovsky, M. Reyhanoglu and N. H. McClamroch, "Switched Mode Feedback Control Laws for Nonholonomic Systems in Extended Power Form," *Systems & Control Letters*, 27, 1996, 29-36.

I. Kolmanovsky, N. H. McClamroch, and V. T. Coppola, "New Results on Control of Multibody Systems which Conserve Angular Momentum," *Journal of Dynamical and Control Systems*, Vol. 1, No. 4, 1995, 447-462.

I. Kolmanovsky and N. H. McClamroch, "Hybrid Feedback Laws for a Class of Cascade Nonlinear Control Systems," *IEEE Transactions on Automatic Control*, Vol. 41, September, 1996, 1271-1282.

I. Kolmanovsky and N. H. McClamroch, "Controllability and Motion Planning for Noncatastatic Nonholonomic Control Systems," *Mathematical and Computer Modelling*. Vol. 24, No. 1, 1996, 31-42.

H. P. Gavin, R. D. Hanson, and N. H. McClamroch, "Electrorheological Dampers II: Testing and Modeling," *J. Appl. Mech.*, ASME, Vol. 63, 1996, 676-682.

L. B. Wee, M. W. Walker, and N. H. McClamroch, "An Articulated Body Model for a Free-Flying Robot and its Use for Adaptive Motion Control," *IEEE Transactions on Robotics and Automation*, Vol. 13, April, 1997, 264-277.

I. Kolmanovsky and N. H. McClamroch, "Hybrid Feedback Stabilization of Rotational Translational Actuator (RTAC) System," *International Journal of Robust and Nonlinear Control*, Vol. 8, 1998, 367-375.

M. Reyhanoglu, A. van der Schaft, I. Kolmanovsky, and N. H. McClamroch, "Dynamics and Control of a Class of Underactuated Mechanical Systems," *IEEE Transactions on Automatic Control*, Vol. AC-44, September, 1999, 1663-1671.

M. Reyhanoglu, S. Cho, and N. H. McClamroch, "Discontinuous Feedback Control of a Special Class of Underactuated Mechanical Systems," *International Journal of Robust and Nonlinear Control*, Vol.10, 2000, 265-281.

C. Rui, I. Kolmanovsky, and N. H. McClamroch, "Nonlinear Attitude and Shape Control of Spacecraft with Articulated Appendages and Reaction Wheels", IEEE Transactions on Automatic Control, Vol. 45, No. 8, August, 2000, 1455-1469.

N. H. McClamroch and I. Kolmanovsky, "Performance Benefits of Hybrid Control for Linear and Nonlinear Systems," Proceedings of the IEEE, Vol. 88, No. 7, July, 2000, pp. 1083-1096.

S. A. Al-Hiddabi and N. H. McClamroch, "Aggressive Longitudinal Aircraft Trajectory Tracking using Nonlinear Control," J. Guidance, Control and Dynamics, Vol. 25, No. 1, January-February, 2002, 26-32.

S. A. Al-Hiddabi and N. H. McClamroch, "Aggressive Longitudinal Aircraft Path Tracking using Nonlinear Control," Asian Journal of Control, Vol. 3, No. 4, 2001.

S. A. Al-Hiddabi and N. H. McClamroch, "Tracking and Maneuver Regulation Control for Nonlinear Non-minimum Phase Systems: Application to Flight Control," IEEE Transactions on Control Systems Technology, Vol. 10, No. 6, 2002, 780-792.

J. Shen and N. H. McClamroch, "Translational and Rotational Maneuvers of an Underactuated Space Robot using Proof Mass Actuators," International Journal of Robotics Research, Vol. 21, No. 5-6, May-June, 2002, 607-618.

A. X. C. N. Valente, N. H. McClamroch, and I. Mezic, "Hybrid Dynamics of Two Coupled Oscillators that can Impact a Fixed Stop," International Journal of Non-Linear Mechanics, Vol. 38, 2002, 677-689.

S. Cho, J. Shen and N. H. McClamroch, "Mathematical Models for the Triaxial Attitude Control Testbed," Mathematical and Computer Modeling of Dynamical Systems, Vol. 9, No. 2, 2003, 165-192.

S. B. Cho and N. H. McClamroch, "Optimal Orbit Transfer of a Spacecraft with Fixed Tether Length," Journal of Astronautical Sciences, Vol. 51, No. 2, April-June, 2003, 195-204.

D. S. Bernstein, N. H. McClamroch, and J. Shen, "An Air Spindle Testbed for Experimental Investigation of Shape Change Actuation for Precision Attitude Control," IEEE Control Systems Magazine, Vol. 23, No. 5, October, 2003, 44-56.

J. Shen, N. H. McClamroch, and A. M. Bloch, "Local Equilibrium Controllability of Multibody Systems Controlled via Shape Change," IEEE Transactions on Automatic Control, 49, April, 2004, 506-520.

A. K. Sanyal, A. M. Bloch, and N. H. McClamroch, "Dynamics of Multibody Systems in Planar Motion in a Central Gravity Field," *Dynamical Systems*, Vol. 19, No. 4, 2004, 303-343.

A. K. Sanyal, J. Shen, N. H. McClamroch, and A. M. Bloch, "Stability and Stabilization of Relative Equilibria of Dumbbell Bodies in Central Gravity," *Journal of Guidance, Control, and Dynamics*, Vol. 28, No. 5, 2005, 833-842.

N. A. Chaturvedi, A. K. Sanyal, M. Challappa, J. L. Valk, J. Shen, J. Ahmed, N. H. McClamroch, and D. S. Bernstein, "Globally Convergent Adaptive Tracking of Angular Velocity for a Rigid Body without Inertia Modeling," *IEEE Transactions on Control Systems Technology*, Vol. 14, No. 4, July, 2006, 613-627.

N. A. Chaturvedi, A. K. Sanyal, D. S. Bernstein, J. Ahmed, F. Bacconi, and N. H. McClamroch, "Global Convergent Adaptive Tracking of Angular Velocity for a 3 DOF Rigid Body without Inertia Modeling," *IEEE Transactions on Control Systems Technology*, Vol. 14, No. 5, September, 2006, 841-853.

I. Hussein, A. M. Bloch, D. J. Scheeres, A. M. Bloch, D. C. Hyland, and N. H. McClamroch, "Optimal Motion Planning for Dual Spacecraft Interferometry," *IEEE Transactions on Aerospace and Electronic Systems*, Vol. 43, No. 2, 723-737, 2007.

T. Lee, M. Leok, and N. H. McClamroch, "Lie Group Variational Integrators for the Full Body Problem in Orbital Mechanics," *Celestial Mechanics and Dynamical Astronomy*, vol. 98, no. 2, pp. 121-144, June 2007.

T. Lee, M. Leok, and N. H. McClamroch, "Lie Group Variational Integrators for the Full Body Problem," *Computer Methods in Applied Mechanics and Engineering*, vol. 196, pp. 2907-2924, May 2007.

N. A. Chaturvedi, and N. H. McClamroch, "Asymptotic Stabilization of the Hanging Equilibrium Manifold of the 3D Pendulum," *International Journal of Robust and Nonlinear Control*, vol. 17, no 16, 1435-1454, 2007.

A. Sanyal, T. Lee, M. Leok, and N. H. McClamroch, "Global Optimal Attitude Estimation using Uncertainty Ellipsoids," *Systems and Control Letters*, Vol. 57, No. 3, 236-245, 2008.

T. Lee, M. Leok, and N. H. McClamroch, "Optimal Attitude Control of a Rigid Body using Geometrically Exact Computations on $SO(3)$," *Journal of Dynamical and Control Systems*, Vol. 14, No. 4, 465-487, October, 2008.

T. Lee, M. Leok, and N. H. McClamroch, "Computational Geometric Optimal Control of Rigid Bodies," Brockett Legacy special issue of Communications in Information and Systems, Vol. 8, No. 4. 435-462, 2008.

N. A. Chaturvedi, N. H. McClamroch, and D. S. Bernstein, "Stabilization of a 3D Axially Symmetric Pendulum," Automatica, Vol. 44, 2258-2265, 2008.

N. A. Chaturvedi, N. H. McClamroch, and D. S. Bernstein, "Asymptotic Smooth Stabilization of the Inverted 3D Pendulum," IEEE Transactions on Automatic Control, Vol. 54, No. 6, 1204-1215, 2009.

N. A. Chaturvedi and N. H. McClamroch, "Asymptotic Stabilization of the Inverted Equilibrium Manifold of the 3D Pendulum using Non-smooth Feedback," IEEE Transactions on Automatic Control, Vol. 54, No. 11, 2658-2662, 2009.

T. Lee, M. Leok, and N. H. McClamroch, "Lagrangian Mechanics and Variational Integrators on Two-Spheres," International Journal for Numerical Methods in Engineering, Vol. 79, No. 9, 1147-1174, 2009.

B. Jun, D. S. Bernstein and N. H. McClamroch, "Identification of the Inertia Matrix of a Rotating Body based on Errors-in-Variables Models," International Journal of Adaptive Control and Signal Processing, Vol. 24, 203-210, 2010.

N. A. Chaturvedi, T. Lee, M. Leok, and N. H. McClamroch, "Nonlinear Dynamics of the 3D Pendulum," Journal of Nonlinear Science, Vol. 21, 3-32, 2011.

T. Lee, M. Leok, and N. H. McClamroch, "Computational Dynamics of a 3D Elastic String Pendulum Attached to a Rigid Body and an Inertially Fixed Reel Mechanism," Nonlinear Dynamics, Vol. 64, 97-115, 2011.

N. A. Chaturvedi, A. K. Sanyal, and N. H. McClamroch, "Rigid Body Attitude Control: Using Rotation Matrices for Continuous, Singularity-free Control Laws," IEEE Control Systems Magazine, Vol. 31, No. 3, 31-51, 2011.

Publications (Edited Volumes, Reprints, etc):

N. H. McClamroch and J. K. Aggarwal, "On Equivalent Systems in Optimal Control and Stability Theory," System Sensitivity Analysis, ed. J.B. Cruz, 1973.

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