

# Stanford

---



## Sanjay Lall

Professor of Electrical Engineering and of Aeronautics and Astronautics

### Bio

---

#### BIO

Sanjay Lall is Professor of Electrical Engineering in the Information Systems Laboratory and Professor of Aeronautics and Astronautics at Stanford University. He received a B.A. degree in Mathematics with first-class honors in 1990 and a Ph.D. degree in Engineering in 1995, both from the University of Cambridge, England. His research group focuses on algorithms for control, optimization, and machine learning. Before joining Stanford he was a Research Fellow at the California Institute of Technology in the Department of Control and Dynamical Systems, and prior to that he was a NATO Research Fellow at Massachusetts Institute of Technology, in the Laboratory for Information and Decision Systems. He was also a visiting scholar at Lund Institute of Technology in the Department of Automatic Control. He has significant industrial experience applying advanced algorithms to problems including satellite systems, advanced audio systems, Formula 1 racing, the America's cup, cloud services monitoring, and integrated circuit diagnostic systems, in addition to several startup companies. Professor Lall has served as Associate Editor for the journal *Automatica*, on the steering and program committees of several international conferences, and as a reviewer for the National Science Foundation, DARPA, and the Air Force Office of Scientific Research. He is the author of over 130 peer-refereed publications.

#### ACADEMIC APPOINTMENTS

- Professor, Electrical Engineering
- Professor, Aeronautics and Astronautics
- Member, Bio-X
- Affiliate, Precourt Institute for Energy

#### HONORS AND AWARDS

- Fellow, IEEE (2015)
- O. Hugo Schuck Best Paper Award, American Control Conference (2013)
- George S. Axelby Outstanding Paper Award, IEEE (2007)
- Presidential Early Career Award for Scientists and Engineers, National Science Foundation (2007)
- CAREER Award, National Science Foundation (2006)

#### PROFESSIONAL EDUCATION

- PhD, Cambridge (1995)

#### LINKS

- <http://lall.stanford.edu>: <http://lall.stanford.edu>

## Teaching

---

### COURSES

#### 2018-19

- Introduction to Machine Learning: EE 104 (Spr)

#### 2017-18

- Convex Optimization I: CME 364A, CS 334A, EE 364A (Win)
- Introduction to Machine Learning: EE 104 (Spr)

#### 2015-16

- Introduction to Linear Dynamical Systems: CME 263, EE 263 (Aut)
- Linear Control Systems II: ENGR 207B (Win)
- Stochastic Control: EE 266, MS&E 251 (Spr)

### STANFORD ADVISEES

#### Master's Program Advisor

Logan Spear

## Publications

---

### PUBLICATIONS

- **Convexity of Decentralized Controller Synthesis** *IEEE TRANSACTIONS ON AUTOMATIC CONTROL*  
Lessard, L., Lall, S.  
2016; 61 (10): 3122-3127
- **Stability Analysis of Distributed Power Generation With Droop Inverters** *IEEE TRANSACTIONS ON POWER SYSTEMS*  
Chang, C., Gorinevsky, D., Lall, S.  
2015; 30 (6): 3295-3303
- **Optimal Control of Two-Player Systems With Output Feedback** *IEEE TRANSACTIONS ON AUTOMATIC CONTROL*  
Lessard, L., Lall, S.  
2015; 60 (8): 2129-2144
- **Explicit Solutions to Separable Problems in Optimal Cooperative Control** *IEEE TRANSACTIONS ON AUTOMATIC CONTROL*  
Kim, J., Lall, S.  
2015; 60 (5): 1304-1319
- **Optimal Controller Synthesis for Decentralized Systems Over Graphs via Spectral Factorization** *IEEE TRANSACTIONS ON AUTOMATIC CONTROL*  
Swigart, J., Lall, S.  
2014; 59 (9): 2311-2323
- **Dynamical and Voltage Profile Stability of Inverter-Connected Distributed Power Generation** *IEEE TRANSACTIONS ON SMART GRID*  
Chang, C., Gorinevsky, D., Lall, S.  
2014; 5 (4): 2093-2105
- **Polynomial Level-Set Method for Polynomial System Reachable Set Estimation** *IEEE TRANSACTIONS ON AUTOMATIC CONTROL*  
Wang, T., Lall, S., West, M.  
2013; 58 (10): 2508-2521
- **Polynomial level-set method for attractor estimation** *JOURNAL OF THE FRANKLIN INSTITUTE-ENGINEERING AND APPLIED MATHEMATICS*  
Wang, T., Lall, S., West, M.  
2012; 349 (9): 2783-2798

- **Networked Markov Decision Processes With Delays** *IEEE TRANSACTIONS ON AUTOMATIC CONTROL*  
Adlakha, S., Lall, S., Goldsmith, A.  
2012; 57 (4): 1013-1018
- **Decentralized Control via Grbner Bases and Variable Elimination** *IEEE TRANSACTIONS ON AUTOMATIC CONTROL*  
Shin, H. S., Lall, S.  
2012; 57 (4): 1030-1035
- **Optimal Controller Synthesis for the Decentralized Two-Player Problem with Output Feedback** *American Control Conference (ACC)*  
Lessard, L., Lall, S.  
IEEE COMPUTER SOC.2012: 6314-6321
- **Optimal Cooperative Control of Dynamically Decoupled Systems** *51st IEEE Annual Conference on Decision and Control (CDC)*  
Kim, J., Lall, S., Ryoo, C.  
IEEE.2012: 4852-4857
- **Frequency Stability for Distributed Generation Connected through Grid-Tie Inverter** *IEEE International Conference on Power System Technology (POWERCON)*  
Glover, E., Chang, C., Gorinevsky, D., Lall, S.  
IEEE.2012
- **Optimal Cooperative Control of Dynamically Decoupled Systems.**  
Kim, J., H., Lall, S., Ryoo, C., K.  
2012
- **Frequency Stability for Distributed Generation Connected through Grid-Tie Inverter.**  
Glover, E., Chang, C., C., Gorinevsky, D., Lall, S.  
2012
- **Separable Optimal Cooperative Control Problems** *American Control Conference (ACC)*  
Kim, J., Lall, S.  
IEEE COMPUTER SOC.2012: 5868-5873
- **Polynomial Method for PLL Controller Optimization** *SENSORS*  
Wang, T., Lall, S., Chiou, T.  
2011; 11 (7): 6575-6592
- **Synthesis for Optimal Two-Player Decentralized Control over TCP Erasure Channels with State Feedback** *50th IEEE Conference of Decision and Control (CDC)/European Control Conference (ECC)*  
Chang, C., Lall, S.  
IEEE.2011: 3824-3829
- **A State-Space Solution to the Two-Player Decentralized Optimal Control Problem.**  
Lessard, L., Lall, S.  
2011
- **Decentralized Control.** *Networked Control Systems. Lecture Notes in Control and Information Sciences*  
Swigart, J., Lall, S.  
2011; 406: 179-201
- **Optimal Controller Synthesis for a Decentralized Two-Player System with Partial Output Feedback** *American Control Conference (ACC)*  
Swigart, J., Lall, S.  
IEEE.2011: 317-323
- **An Explicit Solution for Optimal Two-Player Decentralized Control over TCP Erasure Channels with State Feedback** *American Control Conference (ACC)*  
Chang, C., Lall, S.  
IEEE.2011: 4717-4722
- **Decentralized Robust Control via Quadratically Invariant Model Projection** *American Control Conference (ACC)*  
Kim, J., Lall, S., Merrill, W., Behbahani, A.

---

IEEE.2011: 527–532

- **Quadratic Invariance is Necessary and Sufficient for Convexity** *American Control Conference (ACC)*  
Lessard, L., Lall, S.  
IEEE.2011: 5360–5362
- **A Unifying Condition for Separable Two Player Optimal Control Problems** *50th IEEE Conference of Decision and Control (CDC)/European Control Conference (ECC)*  
Kim, J., Lall, S.  
IEEE.2011: 3818–3823
- **Coding Strategies for a Class of Decentralized Control Problems with Limited Communication** *50th IEEE Conference of Decision and Control (CDC)/European Control Conference (ECC)*  
Mirghaderi, R., Lall, S., Goldsmith, A.  
IEEE.2011: 4809–4816
- **Fast Algorithms for Resource Allocation in Wireless Cellular Networks** *IEEE-ACM TRANSACTIONS ON NETWORKING*  
Madan, R., Boyd, S. P., Lall, S.  
2010; 18 (3): 973-984
- **Optimal Synthesis and Explicit State-Space Solution for a Decentralized Two-Player Linear-Quadratic Regulator** *49th IEEE Conference on Decision and Control (CDC)*  
Swigart, J., Lall, S.  
IEEE.2010: 132–137
- **Distributed Engine Control Design Considerations.**  
Merrill, W., Kim, J., H., Lall, S., Majerus, S., Howe, D., Behbahani, A.  
2010
- **Convexity of Optimal Control over Networks with Delays and Arbitrary Topology.** *International Journal of Systems, Control and Communications*  
Rotkowitz, M., Cogill, R., Lall, S.  
2010; 2 (1-3): 30–54
- **An Exact Dynamic Programming Solution for a Decentralized Two-Player Markov Decision Process.**  
Wu, J., Lall, S.  
2010
- **An Explicit Dynamic Programming Solution for a Decentralized Two-Player Optimal Linear-Quadratic Regulator.**  
Swigart, J., Lall, S.  
2010
- **An Explicit State-Space Solution for a Decentralized Two-Player Optimal Linear-Quadratic Regulator** *American Control Conference*  
Swigart, J., Lall, S.  
IEEE.2010: 6385–6390
- **Optimal Decentralized Control of Linear Systems via Groebner Bases and Variable Elimination** *American Control Conference*  
Shin, H. S., Lall, S.  
IEEE.2010: 5608–5613
- **A Constant Factor Approximation Algorithm for Event-Based Sampling** *Symposium on Systems, Control and Signal Processing held in Honor of Yutaka Yamamoto*  
Cogill, R., Lall, S., Hespanha, J. P.  
SPRINGER-VERLAG BERLIN.2010: 51–60
- **An Algebraic Framework for Quadratic Invariance** *49th IEEE Conference on Decision and Control (CDC)*  
Lessard, L., Lall, S.  
IEEE.2010: 2698–2703
- **Nonlinear Youla Parametrization and Information Constraints for Decentralized Control** *American Control Conference*  
Wu, J., Lall, S.  
IEEE.2010: 5614–5619

- **An Approximate Dynamic Programming Approach to the Dynamic Traveling Repairperson Problem** *49th IEEE Conference on Decision and Control (CDC)*  
Shin, H. S., Lall, S.  
IEEE.2010: 2286–2291
- **A Dynamic Programming Algorithm for Decentralized Markov Decision Processes with a Broadcast Structure** *49th IEEE Conference on Decision and Control (CDC)*  
Wu, J., Lall, S.  
IEEE.2010: 6143–6148
- **Internal Quadratic Invariance and Decentralized Control** *American Control Conference*  
Lessard, L., Lall, S.  
IEEE.2010: 5596–5601
- **Hat Guessing Games and the Use of Coding for Decentralized Control** *49th IEEE Conference on Decision and Control (CDC)*  
Mirghaderi, R., Adlakha, S., Lall, S., Goldsmith, A.  
IEEE.2010: 979–985
- **A Computational Approach for Decentralized Control of Turbine Engines** *49th IEEE Conference on Decision and Control (CDC)*  
Kim, J., Lall, S., Merrill, W., Behbahani, A.  
IEEE.2010: 346–351
- **Analysis of Polynomial Systems With Time Delays via the Sum of Squares Decomposition** *IEEE TRANSACTIONS ON AUTOMATIC CONTROL*  
Papachristodoulou, A., Peet, M. M., Lall, S.  
2009; 54 (5): 1058-1064
- **Spectral Factorization of Non-Classical Information Structures Under Feedback** *American Control Conference 2009*  
Swigart, J., Lall, S.  
IEEE.2009: 457–462
- **Model reduction, optimal prediction, and the Mori-Zwanzig representation of Markov chains** *Joint 48th IEEE Conference on Decision and Control (CDC) / 28th Chinese Control Conference (CCC)*  
Beck, C. L., Lall, S., Liang, T., West, M.  
IEEE.2009: 3282–3287
- **Reduction of Decentralized Control Problems to Tractable Representations** *Joint 48th IEEE Conference on Decision and Control (CDC) / 28th Chinese Control Conference (CCC)*  
Lessard, L., Lall, S.  
IEEE.2009: 1621–1626
- **A Graph-Theoretic Approach to Distributed Control over Networks** *Joint 48th IEEE Conference on Decision and Control (CDC) / 28th Chinese Control Conference (CCC)*  
Swigart, J., Lall, S.  
IEEE.2009: 5409–5414
- **Reduction of Decentralized Control Problems to Tractable Representations.**  
Lessard, L., Lall, S.  
2009
- **Model reduction, optimal prediction, and the Mori-Zwanzig representation of Markov chains.**  
Beck, C., L., Lall, S., Liang, T., West, M.  
2009
- **A Graph-Theoretic Approach to Distributed Control over Networks.**  
Swigart, J., Lall, S.  
2009
- **Time-delayed Decentralized H-infinity Controller Design for Civil Structures: a Homotopy Method through Linear Matrix Inequalities** *American Control Conference 2009*  
Wang, Y., Law, K. H., Lall, S.  
IEEE.2009: 4549–4556

- **POSITIVE FORMS AND STABILITY OF LINEAR TIME-DELAY SYSTEMS** *SIAM JOURNAL ON CONTROL AND OPTIMIZATION*  
Peet, M. M., Papachristodoulou, A., Lall, S.  
2009; 47 (6): 3237-3258
- **Decentralized Team Decision Via Coding** *47th Annual Allerton Conference on Communication, Control, and Computing*  
Adlakha, S., Mirghaderi, S. R., Lall, S., Goldsmith, A.  
IEEE.2009: 151–151
- **Experimental validation of single-iteration multigrid wavefront reconstruction at the Palomar Observatory** *OPTICS LETTERS*  
Lessard, L., MacMynowski, D., West, M., Bouchez, A., Lall, S.  
2008; 33 (18): 2047-2049
- **Testing static equilibrium for legged robots** *IEEE TRANSACTIONS ON ROBOTICS*  
Bretl, T., Lall, S.  
2008; 24 (4): 794-807
- **Structured semidefinite programs for the control of symmetric systems** *AUTOMATICA*  
Cogill, R., Lall, S., Parrilo, P. A.  
2008; 44 (5): 1411-1417
- **Warm-started wavefront reconstruction for adaptive optics** *JOURNAL OF THE OPTICAL SOCIETY OF AMERICA A-OPTICS IMAGE SCIENCE AND VISION*  
Lessard, L., West, M., MacMynowski, D., Lall, S.  
2008; 25 (5): 1147-1155
- **Information State for Markov Decision Processes with Network Delays** *47th IEEE Conference on Decision and Control*  
Adlakha, S., Lall, S., Goldsmith, A.  
IEEE.2008: 3840–3847
- **Dynamic Programming with Non-Classical Information Structures.** *Mathematical Theory of Networks and Systems*  
Swigart, J., Lall, S.  
2008
- **POSITIVE FORMS AND STABILITY OF LINEAR TIME-DELAY SYSTEMS** *SIAM JOURNAL ON CONTROL AND OPTIMIZATION*  
Peet, M. M., Papachristodoulou, A., Lall, S.  
2008; 47 (6): 3237-3258
- **Stochastic Multiscale Approaches to Consensus Problems** *47th IEEE Conference on Decision and Control*  
Kim, J., West, M., Lall, S., Scholte, E., Banaszuk, A.  
IEEE.2008: 5551–5557
- **Nonlinear Phase-Locked Loop Design using Semidefinite Programming** *16th Mediterranean Conference on Control and Automation*  
Wang, T., Chiou, T., Lall, S.  
IEEE.2008: 1047–1052
- **A Bayesian Network Approach to Control of Networked Markov Decision Processes** *46th Annual Allerton Conference on Communication, Control and Computing*  
Adlakha, S., Lall, S., Goldsmith, A.  
IEEE.2008: 446–451
- **Modeling and optimization of transmission schemes in energy-constrained wireless sensor networks** *IEEE-ACM TRANSACTIONS ON NETWORKING*  
Madan, R., Cui, S., Lall, S., Goldsmith, A. J.  
2007; 15 (6): 1359-1372
- **Cross-layer energy and delay optimization in. small-scale sensor networks** *IEEE TRANSACTIONS ON WIRELESS COMMUNICATIONS*  
Cui, S., Madan, R., Goldsmith, A. J., Lall, S.  
2007; 6 (10): 3688-3699
- **Global stability analysis of a nonlinear model of Internet congestion control with delay** *IEEE TRANSACTIONS ON AUTOMATIC CONTROL*  
Peet, M., Lall, S.

---

2007; 52 (3): 553-559

- **Optimal control of distributed Markov decision processes with network delays** *46th IEEE Conference on Decision and Control*  
Adlakha, S., Madan, R., Lall, S., Goldsmith, A.  
IEEE.2007: 4804–4810
- **A Constant Factor Approximation Algorithm for Event-Based Sampling.**  
Cogill, R., Lall, S., Hespanha, J.  
2007
- **Affine controller parameterization for decentralized control over Banach spaces** *IEEE TRANSACTIONS ON AUTOMATIC CONTROL*  
Rotkowitz, M., Lall, S.  
2006; 51 (9): 1497-1500
- **Distributed algorithms for maximum lifetime routing in wireless sensor networks** *IEEE GLOBECOM 2004*  
Madan, R., Lall, S.  
IEEE-INST ELECTRICAL ELECTRONICS ENGINEERS INC.2006: 2185–93
- **An energy-optimal algorithm for neighbor discovery in wireless sensor networks** *2nd Workshop on Modeling and Optimization in Mobile, Ad Hoc and Wireless Networks*  
Madan, R., Lall, S.  
SPRINGER.2006: 317–26
- **Discrete variational Hamiltonian mechanics** *JOURNAL OF PHYSICS A-MATHEMATICAL AND GENERAL*  
Lall, S., West, M.  
2006; 39 (19): 5509-5519
- **A characterization of convex problems in decentralized control** *IEEE TRANSACTIONS ON AUTOMATIC CONTROL*  
Rotkowitz, M., Lall, S.  
2006; 51 (2): 274-286
- **An approximation algorithm for the discrete team decision problem** *SIAM JOURNAL ON CONTROL AND OPTIMIZATION*  
Cogill, R., Lall, S.  
2006; 45 (4): 1359-1368
- **Convexification of Optimal Decentralized Control Without a Stabilizing Controller.**  
Rotkowitz, M., Lall, S.  
2006
- **A Constant Factor Approximation Algorithm for Event-Based Sampling.**  
Cogill, R., Lall, S., Hespanha, J.  
2006
- **A space-time diffusion scheme for peer-to-peer least-squares estimation** *5th International Conference on Informational Processing in Sensor Networks*  
Xiao, L., Boyd, S., Lall, S.  
ASSOC COMPUTING MACHINERY.2006: 168–176
- **An approximate dynamic programming approach to decentralized control of stochastic systems** *Workshop on Control of Uncertain Systems*  
Cogill, R., Rotkowitz, M., Van Roy, B., Lall, S.  
SPRINGER-VERLAG BERLIN.2006: 243–256
- **Backlog analysis of maximal matching switching with speedup** *45th IEEE Conference on Decision and Control*  
Cogill, R., Lall, S.  
IEEE.2006: 1876–1881
- **Suboptimality bounds in stochastic control: A queueing example** *American Control Conference 2006*  
Cogill, R., Lall, S.  
IEEE.2006: 1642–1647
- **Positive forms and stability of linear time-delay systems** *45th IEEE Conference on Decision and Control*  
Peet, M., Papachristodoulou, A., Lall, S.

IEEE.2006: 187–193

- **A fast and adaptive test of static equilibrium for legged robots** *IEEE International Conference on Robotics and Automation (ICRA)*  
Bretl, T., Lall, S.  
IEEE.2006: 1109–1116
- **Degree bounds for polynomial verification of the matrix cube problem** *45th IEEE Conference on Decision and Control*  
Chen, B., Lall, S.  
IEEE.2006: 4405–4410
- **A characterization of convex problems in decentralized control** *IEEE TRANSACTIONS ON AUTOMATIC CONTROL*  
Rotkowitz, M., Lall, S.  
2005; 50 (12): 1984–1996
- **A simple condition for the convexity of optimal control over networks with delays** *44th IEEE Conference on Decision Control/European Control Conference (CCD-ECC)*  
Rotkowitz, M., Cogill, R., Lall, S.  
IEEE.2005: 6686–6691
- **Cross-Layer Design for Lifetime Maximization in Interference-Limited Wireless Sensor Networks.**  
Madan, R., Cui, S., Lall, S., Goldsmith, A.  
2005
- **A Distributed Algorithm with Linear Convergence for Maximum Lifetime Routing in Wireless Networks.**  
Madan, R., Luo, Z.-Q., Lall, S.  
2005
- **Mixed Integer-Linear Programming for Link Scheduling in Interference-Limited Networks.**  
Madan, R., Cui, S., Lall, S., Goldsmith, A., J.  
2005
- **Polynomial level-set methods for nonlinear dynamical systems analysis.**  
Wang, T., Lall, S., West, M.  
2005
- **Multi-step motion planning for free-climbing robots** *6th International Workshop on Algorithmic Foundations of Robotics*  
Bretl, T., Lall, S., Latombe, J. C., Rock, S.  
SPRINGER-VERLAG BERLIN.2005: 59–74
- **Joint routing, MAC, and link layer optimization in sensor networks with energy constraints** *IEEE International Conference on Communications (ICC 2005)*  
Cui, S. G., Madan, R., Goldsmith, A., Lall, S.  
IEEE.2005: 725–729
- **Tractable fitting with convex polynomials via sum-of-squares** *44th IEEE Conference on Decision Control/European Control Conference (CCD-ECC)*  
Magnani, A., Lall, S., Boyd, S.  
IEEE.2005: 1672–1677
- **A scheme for robust distributed sensor fusion based on average consensus** *4th International Symposium on Information Processing in Sensor Networks*  
Xiao, L., Boyd, S., Lall, S.  
IEEE.2005: 63–70
- **Energy-delay tradeoffs for data collection in TDMA-based sensor networks** *IEEE International Conference on Communications (ICC 2005)*  
Cui, S. G., Madan, R., Goldsmith, A., Lall, S.  
IEEE.2005: 3278–3284
- **Decentralized stochastic decision problems and polynomial optimization** *American Control Conference 2005 (ACC)*  
Cogill, R., Lall, S.  
IEEE.2005: 2709–2714
- **Cross-layer design for lifetime maximization in interference-limited wireless sensor networks** *24th Annual Joint Conference of the IEEE Computer and Communications Societies*



- 
- Madan, R., Cui, S. G., Lall, S., Goldsmith, A.  
IEEE COMPUTER SOC.2005: 1964–1975
- **Constructing Lyapunov-Krasovskii functionals for linear time delay systems** *American Control Conference 2005 (ACC)*  
Papachristodoulou, A., Peet, M., Lall, S.  
IEEE.2005: 2845–2850
  - **Control design for topology-independent stability of interconnected systems** *American Control Conference*  
Cogill, R., Lall, S.  
IEEE.2004: 3717–3722
  - **Cross-layer Energy Minimization in TDMA-based Sensor Networks.**  
Cui, S., Madan, R., Goldsmith, A., Lall, S.  
2004
  - **Constructing Lyapunov Functions for Nonlinear Delay-Differential Equations using Semidefinite Programming.**  
Peet, M., Lall, S.  
2004
  - **An Energy-Optimal Algorithm for Neighbor Discovery in Wireless Sensor Networks.**  
Madan, R., Lall, S.  
2004
  - **An Approximate Dynamic Programming Approach to Decentralized Control of Stochastic Systems**  
Cogill, R., Rotkowitz, M., Roy, B., Van, Lall, S.  
2004
  - **A Distributed Algorithm for Maximum Lifetime Routing in Ad Hoc Wireless Networks.**  
Madan, R., Lall, S.  
2004
  - **Multi-Step Motion Planning for Free-Climbing Robots.**  
Bretl, T., Lall, S., Latombe, J., C., Rock, S.  
2004
  - **Decentralized Stochastic Decision Problems and Polynomial Optimization.**  
Cogill, R., Lall, S.  
2004
  - **Distributed algorithms for maximum lifetime routing in wireless sensor networks** *IEEE Global Telecommunications Conference (GLOBECOM 04)*  
Madan, R., Lall, S.  
IEEE.2004: 748–753
  - **Decentralized control subject to communication and propagation delays** *43rd IEEE Conference on Decision and Control*  
Rotkowitz, M., Lall, S.  
IEEE.2004: 4990–4997
  - **Control of distributed discrete-time systems on graphs** *American Control Conference*  
Chen, B. D., Lall, S.  
IEEE.2004: 2251–2256
  - **On global stability of Internet congestion control** *43rd IEEE Conference on Decision and Control*  
Peet, M., Lall, S.  
IEEE.2004: 1035–1041
  - **Topology independent controller design for networked systems** *43rd IEEE Conference on Decision and Control*  
Cogill, R., Lall, S.  
IEEE.2004: 1788–1793
  - **On computation of optimal controllers subject to quadratically invariant sparsity constraints** *American Control Conference*  
Rotkowitz, M., Lall, S.

---

IEEE.2004: 5659–5664

- **Structure-preserving model reduction for mechanical systems** *Conference on Complexity and Nonlinearity in Physical Systems held in Honor of Alan Newell*  
Lall, S., Krysl, P., Marsden, J. E.  
ELSEVIER SCIENCE BV.2003: 304–18
- **Error-bounds for balanced model-reduction of linear time-varying systems** *IEEE TRANSACTIONS ON AUTOMATIC CONTROL*  
Lall, S., Beck, C.  
2003; 48 (6): 946-956
- **Decentralized control of unstable systems and quadratically invariant information constraints** *42nd IEEE Conference on Decision and Control*  
Rotkowitz, M., Lall, S.  
IEEE.2003: 2865–2871
- **On Structured Semidefinite Programs for the Control of Symmetric Systems.**  
Cogill, R., Lall, S., Parrilo, P., A.  
2003
- **Semidefinite programming relaxations and algebraic optimization in control** *7th European Control Conference*  
Parrilo, P. A., Lall, S.  
LAVOISIER.2003: 307–21
- **Dissipation inequalities for distributed systems on graphs** *42nd IEEE Conference on Decision and Control*  
Chen, B. D., Lall, S.  
IEEE.2003: 3084–3090
- **A subspace approach to balanced truncation for model reduction of nonlinear control systems** *INTERNATIONAL JOURNAL OF ROBUST AND NONLINEAR CONTROL*  
Lall, S., Marsden, J. E., Glavaski, S.  
2002; 12 (6): 519-535
- **Decentralized control information structures preserved under feedback** *41st IEEE Conference on Decision and Control*  
Rotkowitz, M., Lall, S.  
IEEE.2002: 569–575
- **An LMI solution to the robust synthesis problem for multi-rate sampled-data systems** *AUTOMATICA*  
Lall, S., Dullerud, G.  
2001; 37 (12): 1909-1922
- **Dimensional model reduction in non-linear finite element dynamics of solids and structures** *INTERNATIONAL JOURNAL FOR NUMERICAL METHODS IN ENGINEERING*  
Krysl, P., Lall, S., Marsden, J. E.  
2001; 51 (4): 479-504
- **Dimensional Model Reduction in Non-Linear Finite Element Dynamics of Solids and Structures.** *International Journal for Numerical Methods in Engineering*  
Krysl, P., Lall, S., Marsden, J., E.  
2001; 51 (4): 479--504
- **A new approach for analysis and synthesis of time-varying systems** *IEEE TRANSACTIONS ON AUTOMATIC CONTROL*  
Dullerud, G. E., Lall, S.  
1999; 44 (8): 1486-1497
- **Asynchronous hybrid systems with jumps - analysis and synthesis methods** *SYSTEMS & CONTROL LETTERS*  
Dullerud, G. E., Lall, S.  
1999; 37 (2): 61-69
- **Empirical Model Reduction of Controlled Nonlinear Systems.**  
Lall, S., Marsden, J., E., Glavaski, S.  
1999
- **Model Reduction of Complex Systems in the Linear-Fractional Framework.**

- 
- Lall, S., Beck, C.  
1999
- **Model Reduction for Analysis of Cascading Failures in Power Systems.**  
Parrilo, P., A., Lall, S., Paganini, F., Verghes, G., C., Lesieutre, B., C., Marsden, J., E.  
1999
  - **Asynchronous Hybrid Systems with Jumps -- Analysis and Synthesis Methods.** *Systems and Control Letters*  
Dullerud, G., Lall, S.  
1999; 37 (2): 61--69
  - **A New Approach for Analysis and Synthesis of Time-Varying Systems.** *IEEE Transactions on Automatic Control*  
Dullerud, G., Lall, S.  
1999; 44 (8): 1486--1497
  - **Convex L<sub>2</sub> Synthesis for Multidimensional Systems.** *CDC*  
D'Andrea, R., Dullerud, G., Lall, S.  
1998: 1883--1888
  - **Guaranteed error bounds for model reduction of linear time-varying systems** *American Control Conference*  
Lall, S., Beck, C., Dullerud, G.  
IEEE.1998: 634--638
  - **Convex l(2) synthesis for multidimensional systems** *37th IEEE Conference on Decision and Control*  
D'Andrea, R., Dullerud, G. E., Lall, S.  
IEEE.1998: 1883--1888
  - **Control of spatially varying distributed systems** *37th IEEE Conference on Decision and Control*  
Dullerud, G. E., D'Andrea, R., Lall, S. G.  
IEEE.1998: 1889--1893
  - **Guaranteed Error Bounds for Model Reduction of Linear Time-Varying Systems.**  
Lall, S., Beck, C., Dullerud, G.  
1998
  - **Control of Spatially-Varying Distributed Systems.**  
Dullerud, G., D'Andrea, R., Lall, S.  
1998
  - **H-infinity Synthesis for Multi-Rate Hybrid Systems.**  
Lall, S., Dullerud, G.  
1997
  - **H-infinity synthesis for hybrid systems with jumps** *1997 American Control Conference*  
Dullerud, G. E., Lall, S. G.  
IEEE.1997: 1672--1676
  - **H-infinity synthesis for multi-rate hybrid systems** *36th IEEE Conference on Decision and Control*  
Lall, S. G., Dullerud, G. E.  
IEEE.1997: 2035--2040
  - **Analysis and synthesis tools for time-varying systems** *36th IEEE Conference on Decision and Control*  
Dullerud, G. E., Lall, S. G.  
IEEE.1997: 4543--4548
  - **H-infinity synthesis for hybrid systems with jumps.**  
Dullerud, G., Lall, S.  
1997
  - **Localized Optimal Control of Spatiotemporal Chaos.**  
Grigoriev, R., Lall, S., Dullerud, G.

1997

- **Analysis and Synthesis Tools for Time-Varying Systems.**

Dullerud, G., Lall, S.

1997

- **Quasi-Decentralised Control.**

Utidjian, H., Maciejowski, J., M., Lall, S.

1995

- **Robust Performance and Adaptation Using Receding Horizon H-infinity Control of Time Varying Systems.**

Lall, S., Glover, K.

1995

- **Riccati Differential Inequalities: Suboptimal H-infinity Controllers for Finite Horizon Time-Varying Systems.**

Lall, S., Glover, K.

1995

- **Optimal Discretization of a Continuous-Time Controller.**

Utidjian, H., Maciejowski, J., M., Lall, S.

1995

- **Robust Control Synthesis in the Time Domain.** *Cambridge University*

Lall, S.

1995

- **A Game Theoretic Approach to Moving Horizon Control.** *Advances in Model-Based Predictive Control*

Lall, S., Glover, K.

1994: 131--144

- **Layout Reconstruction of Complex Silicon Chips.** *IEEE Journal of Solid State Circuits*

Blythe, S., Fraboni, B., Lall, S., Ahmed, H., de Riu, U.

1993; 28 (2): 138--145