

# VITA

## Christopher V. Hollot

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### PRESENT POSITION

Professor, Department of Electrical and Computer Engineering, University of Massachusetts, Amherst, MA 01003

### PERSONAL DATA

Birthdate: February 9, 1953

Married

### EDUCATION

1984 - Ph.D., Electrical Engineering, University of Rochester, Rochester, NY.

1980 - M.S., Electrical Engineering, Syracuse University, Syracuse, NY.

1974 - B.S., Electrical Engineering, West Virginia University, Morgantown, WV.

### HONORS AND AWARDS

Benjamin J. Dasher Best Paper Award (with B. Leonard and W.J. Gerace), 2009.

Plenary Lecture, XVI Brazilian Automation Conference, Salvador, Brazil, 2006.

College of Engineering, Outstanding Senior Faculty Award, 2004.

IEEE Fellow, 2004.

Nominee, University's Distinguished Teaching Award, 1987, 2003, 2004.

ECE Outstanding Faculty Teaching Award, 1987, 1998, 2001, 2002, 2004.

Plenary Lecturer, Conference on System Structure and Control, Bucharest, 1997.

Plenary Lecturer, 11th Benelux Meeting, Veldoven, The Netherlands, 1993.

NATO Senior Guest Fellowship, 1992.

NSF Presidential Young Investigator Award, 1988.

Edward P. Curtis Award, Excellence in Teaching by a Graduate Student, 1984.

Eta Kappa Nu, West Virginia University, 1973.

Tau Beta Pi, West Virginia University, 1973.

### PROFESSIONAL CAREER

12/12-3/13 Interim Dean, College of Engineering

9/06- Department Head, ECE Department, Interim (9/06-8/07)

9/02-9/06 Associate Department Head, ECE Department

9/02- Professor, University of Massachusetts, Amherst, MA

9/94-8/96: Associate Department Head, ECE Department.

5/93-8/93: Visiting Professor, Automatic Control Lab, ETH, Zurich, CH.

9/92-5/93: Visiting Professor, Automatic Control Lab, Louvain-la-Neuve, BE.

9/90-9/02: Associate Professor, University of Massachusetts, Amherst, MA.

6/89-7/89: Visiting Scientist, DLR, Oberpfaffenhofen, FRG.

9/84-9/90: Assistant Professor, University of Massachusetts, Amherst, MA.

9/83-7/84 Lecturer, University of Rochester, Rochester, NY.

6/74-1/79 Engineer, General Electric Company, Binghamton, NY.

### **Ph.D. THESES ADVISED**

1. Andrew C. Bartlett, *Vertex and Edge Theorems Which Simplify Classical Analyses of Linear Systems with Uncertain Parameters*, ECE, 1990.
2. Zhong-Ling Xu, *Polynomial Families with Multilinear Parameters*, 1991.
3. Mujdat Arabacioglu, *Stabilization of Uncertain Discrete-Time and Sampled-Data Control Systems*, ECE, 1991.
4. Prasad Padmanabhan, *Interval Polynomials, Matrices and Roots*, ECE, 1993.
5. Hanzhong Hu, *Robust Sampled-Data Control of Uncertain Linear Systems*, ECE, 1994.
6. Fan Yang, *Robust Stabilization for Plant Errors Described by Sector-Shaped Value Sets*, ECE, 1995.
7. Yuan Zheng, *Theory and Practical Considerations in Reset Control Design*, MIE, 1998 (Y. Chait, Co-Advisor).
8. Qian Chen, *Stability of Reset Control Systems*, MIE, 2000 (Y. Chait, Co-Advisor).
9. Orhan Beker, *Analysis of Reset Control Systems*, ECE, 2001 (Y. Chait, Co-Advisor).
10. Varodom Toochinda, *Fundamental Limitations of Active Noise Control in One-Dimensional Ducts Using Two Sensors and One Actuator*, MIE 2001 (Y. Chait, Co-Advisor).
11. Huaizhong Han, *Modelling and Analysis of TCP Network Dynamics*, ECE 2006 (Y. Chait, Co-Advisor).
12. Rajiv Shrestha, *Modeling the Lifespan of Red Blood Cells*, MIE 2012, (Y. Chait, J. Horowitz, Co-Advisors).

### **M.S. THESES ADVISED**

1. Merlyn Lee, *Lyapunov-Based Approach for Obstacle Avoidance and Target Attainment*, 1988.
2. Sandeep Gupta, *Learning Control for System With Backlash Nonlinearity*, 1989.
3. Prasad Padmanabhan, *Modeling, Simulation and Control of a Xerographic Process - Toner Maintenance Subsystem*, 1991.
4. David P. Lawrence, *Issues in Using Non-Parametric Models to Represent Parametric Uncertainty*, 1991.
5. Shi-Fu Cheu, *Robust Stabilization of Systems Having Parametric Uncertainty*, 1991.
6. Robert C. Osborne, *Robust Control Synthesis Using Coprime Factor Uncertainty Models*, 1993.
7. Syed Khaleel Ahmed, *Non-Parametric Covers for Parametric Uncertainty; Application to the Robust Control of Some Flexible Mechanical Systems*, 1993.
8. Edgardo G. Eszter, *Quadratic Relational Model: A Framework for Robustness Problems Associated with Structured Uncertainty*, 1994.
9. Prashant Mehta, *Fixed-Filter Designs for Active Noise Control in Ducts*, 1996.
10. Lijun Li, *Experimental Investigation of Linear Time-Invariant Feedforward Active Noise Control Design from Experimental Frequency Responses*, 1999 (Y. Chait, Co-Advisor).
11. Alec Faynberg, *Regulation of Adsorption in a Dewar*, October 2001.

12. Srikanth Mashetty, *Analysis of a single server fluid queuing systems with feedback using stochastic differential equations*, August 2004.
13. Erman Korkut, *Limit Cycling in TCP Networks*, August 2006.

#### **ASSOCIATE EDITORSHIPS**

*IFAC Annual Reviews of Control: 2001 – present.*  
*Automatica: 1996 – 1999.*  
*Systems and Control Letters: 1993 – 1997.*  
*IEEE Transactions on Automatic Control: 1993 – 1996.*

#### **OTHER PROFESSIONAL ACTIVITIES**

NSF Panelist, Career Award Fall 2002.  
 Publicity Chair, *IEEE CDC*, 2001.  
 Member, International Program Committee, *IFAC Symposium on Robust Control Design, Prague, June, 2000.*  
 Co-Organizer, International Workshop, *Control of Uncertain Systems, Emerging Directions*, HKUST, Hong Kong, June-July, 1999.  
 Member, International Program Committee, *IFAC World Congress, Beijing, 1999.*  
 Co-organizer, Invited Session, *American Control Conference, 1998.*  
 Proposal Panelist, *NSF*, Washington, D.C., June, 1997.  
 Member, International Program Committee, *SSC97*, Bucharest.  
 Vice-Chairman, Technical Program Committee, *IEEE CDC, 1997.*  
 Program Committee, *European Control Conference, 1997.*  
 Workshop Organizer and Chair, *IFAC Workshop on Robust Control*, Napa, 1996.  
 Chair, *IFAC Technical Committee on Robust Control*, 1996 – present.  
 Proposal Panelist, *NSF*, Washington, D.C., July, 1994.  
 Vice-Chair, *IFAC Technical Committee on Robust Control*, 1993 - 1996.  
 Co-organizer, Workshop on Robust Control, *IEEE CDC*, San Antonio, 1993.  
 Co-organizer, Technical Session, *1988 American Control Conference*  
 Vice-Chairman, Technical Program Committee, *IEEE CDC*, 1988.

#### **CONSULTING**

Xerox Corporation, Rochester, NY, 1981-1983, 1985-1991, 1994  
 GM-Delphi, Saginaw, MI, 1996  
 M/A-Comm, Lowell, MA, 2001-2002

## JOURNAL PUBLICATIONS and BOOK CHAPTERS

1. B.R. Barmish and C.V. Hollot, "Counterexample to a Recent Result on the Stability of Interval Matrices by S. Bialas," *International Journal of Control*, Vol. 39, no. 5, pp. 1103-1104, 1984.
2. I.R. Petersen and C.V. Hollot, "A Riccati Equation Approach to the Stabilization of Uncertain Linear Systems," *Automatica*, Vol. 22, no. 4, pp. 397-411, 1986.
3. A.C. Bartlett and C.V. Hollot, "Some Discrete-Time Counterparts to Kharitonov's Stability Criterion for Uncertain Systems," *IEEE Transactions on Automatic Control*, Vol. AC-31, no. 4, pp. 355-356, 1986.
4. C.V. Hollot and A.R. Galimidi, Stabilizing Uncertain Systems: "Recovering Full State Feedback Performance Via an Observer," *IEEE Transactions on Automatic Control*, Vol. AC-31, no. 11, pp. 1050-1053, 1986.
5. L. Huang, C.V. Hollot and A.C. Bartlett, "Stability of Families of Polynomials: Geometric Consideration in Coefficient Space," *International Journal of Control*, Vol. 45, no. 2, pp. 649-666, 1987.
6. L. Huang and C.V. Hollot, "Results on Positive Pairs of Polynomials and Their Application to the Construction of Stability Domains," *International Journal of Control*, Vol. 46, no. 1, pp. 153-159, 1987.
7. C.V. Hollot, "Bound Invariant Lyapunov Functions: A Means for Enlarging the Class of Stabilizable Uncertain Systems," *International Journal of Control*, Vol. 46, no. 1, pp. 161-184, 1987.
8. A.C. Bartlett, C.V. Hollot and L. Huang, "Root Locations of an Entire Polytope of Polynomials: It Suffices to Check the Edges," *Mathematics of Control, Signals and Systems*, Vol. 1, no. 1, pp. 61-71, 1988.
9. A.C. Bartlett and C.V. Hollot. "A Necessary and Sufficient Condition for Schur Invariance and Generalized Stability of Polytopes of Polynomials," *IEEE Transactions on Automatic Control*, Vol. AC-33, no. 6, pp. 575-578.
10. I.R. Petersen and C.V. Hollot, "A High Gain Observer Approach to Disturbance Attenuation Using Measurement Feedback," *International Journal of Control*, Vol. 48, no. 6, pp. 2453-2464, 1988.
11. I.R. Petersen and C.V. Hollot, "High Gain Observers Applied to Problems in the Stabilization of Uncertain Linear Systems, Disturbance Attenuation and  $H_\infty$  Optimization," *International Journal of Adaptive Control and Signal Processing*, Vol. 2, pp. 347-369, 1988.
12. C.V. Hollot and W.E. Schmitendorf, "Simultaneous Stabilization Via Linear State Feedback," *IEEE Transactions on Automatic Control*, Vol. AC-34, no. 3, pp. 1001-1005, 1989.
13. C.V. Hollot, "Kharitonov-Like Results in the Space of Markov Parameters," *IEEE Transactions on Automatic Control*, Vol. 34, no. 5, pp. 536-538, 1989.
14. T.E. Djaferis and C.V. Hollot, "The Stability of a Family of Polynomials Can be Deduced from a Finite Number,  $O(k^3)$ , of Frequency Checks," *IEEE Transactions on Automatic Control*, Vol. 34, no. 9, pp. 982-986, 1989.
15. T.E. Djaferis and C.V. Hollot, "Parameter Partitioning Via Shaping Conditions for the Stability of Families of Polynomials," *IEEE Transactions on Automatic Control*, Vol. 34, no. 11, pp. 1205-1209, 1989.

16. T.E. Djaferis and C.V. Hollot, "A Routh-Like Test for the Stability of Families of Polynomials with Linear Uncertainty," *Systems and Control Letters*, Vol. 13, no. 1, pp. 23-29, 1989.
17. D.S. Bernstein and C.V. Hollot, "Robust Stability for Sampled-Data Control Systems," *Systems and Control Letters*, Vol. 13, no. 2, 1989.
18. C.V. Hollot, D.P. Looze and A.C. Bartlett, "Parametric Uncertainty and Unmodeled Dynamics: Analysis via Parameter Space Methods," *Automatica*, Vol. 26, no. 2, pp. 269-282, 1990.
19. C.V. Hollot and F. Yang, "Robust Stabilization of Interval Plants Using Lead or Lag Compensators," *Systems and Control Letters*, Vol. 14, pp. 9-12, 1990.
20. H. I. Kang, B. R. Barmish, C.V. Hollot and R. Tempo, "Counterexample and Correction to a Recent Result on Robust Stability of a Diamond of Complex Polynomials," *IEEE Transactions on Circuits and Systems*, Vol. 38, no. 11, pp. 1370-1373, 1991.
21. L. Huang, Z. L. Xu and C.V. Hollot, "Some Problems of Lyapunov Method in Linear Continuous-Time Systems," *System Science and Mathematical Sciences*, Vol. 4, no. 3, pp. 244-253, 1991.
22. B. Shafai and C.V. Hollot, "Nonnegative Stabilization of Interval Discrete Systems," *Control of Uncertain Dynamic Systems*, edited by S.P. Bhattacharyya and L.H. Keel, CRC Press, pp. 471-490, 1991.
23. B.R. Barmish, C.V. Hollot, F.J. Kraus and R. Tempo, "Extreme Point Results for Robust Stabilization of Interval Plants with First Order Compensation," *IEEE Transactions on Automatic Control*, Vol. 37, no. 6, pp. 707-714, 1992.
24. P. Padmanabhan and C.V. Hollot, "Complete Instability of a Box of Polynomials," *IEEE Transactions on Automatic Control*, Vol. 37, no. 8, pp. 1230-1233, 1992.
25. B. R. Barmish, C.V. Hollot and R. Tempo, "An Extreme Point Result for Robust Stability of a Diamond of Polynomials," *IEEE Transactions on Automatic Control*, Vol. 37, no. 9, pp. 1460-1462, 1992.
26. L. Huang, L. Wang and C.V. Hollot, "On Robust Stability of Polynomials and Related Topics," *System Science and Mathematical Sciences*, Vol. 5 no. 1, pp. 42-54, 1992.
27. H. Hu and C.V. Hollot, "Robustness of Sampled-Data Systems Having Parametric Uncertainty: A Conic Sector Approach," *IEEE Transactions on Automatic Control*, Vol. 38, no. 10, pp. 1541-1545, 1993.
28. B.R. Barmish, C.V. Hollot, F.J. Kraus and R. Tempo, "Author's Reply," *IEEE Transactions on Automatic Control*, Vol. 38, no. 2, 1993.
29. C.V. Hollot, R. Tempo and V. Blondel, "Performance of Interval Feedback Systems," in *Robustness of Dynamic Systems with Parametric Uncertainty*, M. Mansour, S. Balemi and W. Truol (Eds.), Birkhauser Verlag Basel, pp. 201-209, 1993.
30. C.V. Hollot and R. Tempo, "On the Nyquist Envelope of an Interval Plant Family," *IEEE Transactions on Automatic Control*, Vol. 39, no. 2, pp. 391-396, 1994.
31. C.V. Hollot, "Does Rantzer's Convex Direction Theorem Sound the Death Knell for New Vertex Results in Robust Control?" *Robust Control Theory*, Eds. B.A. Francis and P.P. Khargonekar, Springer-Verlag, Vol. 66, IMA Volumes in Mathematics and Applications, 1995.

32. E.G. Eszter and C.V. Hollot, "An IQC for Uncertainty Satisfying Both Norm-Bounded and Passivity Constraints," *Automatica*, Vol. 33, no. 8, pp. 1545-1548, 1997.
33. J.M. Rodrigues, Y. Chait and C.V. Hollot, "An Efficient Algorithm for Computing QFT Bounds," *ASME Transactions on Dynamical Systems, Measurement and Control*, Vol. 119, pp. 548-552, 1997.
34. H. Hu, Y. Zheng, C.V. Hollot and Y. Chait, "On the Stability of Control Systems Having Clegg Integrators," *Topics in Control and Its Applications*, D.E. Miller and L. Qiu (Eds.), Springer, pp. 107-116, 1999.
35. Y. Chait, Q. Chen and C.V. Hollot, "Automatic Loop-Shaping of QFT Controllers Via Linear Programming," *ASME Journal of Dynamic Systems, Measurement and Control*, Vol. 121, pp. 351-357, 1999.
36. Y. Zheng, Y. Chait, C.V. Hollot, M. Steinbuch and M. Norg, "Experimental Demonstration of Reset Control," *IFAC Journal of Control Engineering Practice*, Vol. 8, no. 2, pp. 113-120, 2000.
37. C.V. Hollot, O. Beker, Y. Chait and Q. Chen, "On Establishing Classic Performance Measures for Reset Control Systems," in *Perspectives in Robust*, Springer-Verlag, R. Mohemani, (Ed.), pp. 123-145, 2001.
38. Q. Chen, Y. Chait and C.V. Hollot, "Analysis of Reset Control Systems Consisting of a FORE and Second-Order Loop," *ASME Journal of Dynamic Systems, Measurements, and Control*, Vol. 123, pp. 279-283, 2001.
39. O. Beker, C.V. Hollot and Y. Chait, "Plant with Integrator: An Example of Reset Control Overcoming Limitations of Linear Feedback," *IEEE Transactions on Automatic Control*, Vol. 46, no. 11, pp. 1797-1799, 2001
40. Y. Chait and C.V. Hollot, "On Horowitz's Contribution to Reset Control," *International Journal on Nonlinear and Robust Control*, Volume 12, no. 3. pp. 335-355, 2002.
41. C.V. Hollot, V. Misra, D. Towsley and W.B. Gong, "Analysis and Design of Controllers for AQM Routers Supporting TCP Flows," *IEEE Transactions on Automatic Control*, Vol. 47, no. 6, pp. 945-959, 2002.
42. J.S. Freudenberg, C.V. Hollot, R.H. Middleton and V. Tootchinda, "Fundamental Design Limitations of the General Control Configuration", *IEEE Transactions on Automatic Control*, Vol. 48, no. 8, pp. 1355 – 1370, 2003.
43. O. Beker, C.V. Hollot, Y. Chait and H. Han, "Fundamental Properties of Reset Control Systems," *Automatica*, Vol. 40, 6, pp. 905-915, 2004.
44. Y. Chait, C.V. Hollot, V. Misra, D. Towsley, H. Zhang C.S. Lui and Yong Cui, "Guaranteed Throughput Using Adaptive Two-Level Coloring at the Network Edge and Preferential Dropping at the Core," *IEEE Transactions on Networking*, Vol. 13, no. 4, pp. 743-754, 2005.
45. H. Han, S. Shakkottai, C.V. Hollot, R. Srikant and D. Towsley, "Multi-Path TCP: A Joint Congestion Control and Routing Scheme to Exploit Path Diversity in the Internet," *IEEE Transactions on Networking*, Vol. 14, no. 6, pp. 1260-1271, 2006.
46. M. Degon, S. R. Chipkin, C. V. Hollot, R. T. Zoeller, Y. Chait, "A Mathematical Model of the Human Thyroid," *Mathematical Biosciences*, Vol. 212, no.1, pp. 22-53, 2008.

47. Rajiv P. Shrestha, C.V. Hollot, Stuart R Chipkin, Claus P. Schmitt, Yossi Chait, "A Mathematical Model of Parathyroid Hormone Response to Acute Changes in Plasma Ionized Calcium Concentration in Humans," *Mathematical Biosciences*, Vol. 226, no.1, pp. 46-57, 2010
48. Steve Merrill, Joe Horowitz, Claudio Traino, Stuart R Chipkin, Christopher V. Hollot, Yossi Chait, "Accuracy and Optimal Timing of Activity Measurements in Estimating Absorbed Dose of Radioiodine in the Treatment of Graves' Disease," *Phys. Med. Biol.* 56 (2011) 557-571.
49. Goli KM, Pinkhasov A, Landry, Chait Y, Horowitz J, Hollot CV, Shrestha RP, Germain MJ, "Update on Anemia and kidney disease," *Book Chapter*, submitted, July, 2011.
50. Yossi Chait, Joseph Horowitz, C.V. Hollot, and Rajiv Shrestha, "Erythropoiesis Modeling for ESA and Iron Dosing Protocols," *Book Chapter*, submitted, July, 2011.
51. R. Shresta, J. Horowitz, C.V. Hollot, M. Germain, J.A. Widness, D.M. Mock, P. Veng-Pedersen, Y. Chait, "Models for the red blood cell lifespan," *Journal of Pharmacokinetics and Pharmacodynamics*, pp. 1-16, 2016. doi:10.1007/s10928-016-9470-4.
52. Samandari H, Schneditz D, Germain MJ, Horowitz J, Hollot CV, Chait Y. Variable-Volume Kinetic Model to Estimate Absolute Blood Volume in Patients on Dialysis Using Dialysate Dilution. *ASAIO J.* 2017 Jul 24.

### 53. CONFERENCE, WORKSHOP -- PRESENTATIONS AND PROCEEDINGS

1. B.R. Barmish and C.V. Hollot, "Optimal Quadratic Stabilizability of Uncertain Linear Systems," *Proceedings of the 18th Allerton Conference on Communication, Control and Computing*, University of Illinois, Monticello, pp. 697-706, 1980.
2. B.R. Barmish and C.V. Hollot, "Application of Continuous Selections to a Class of Guaranteed Stability Problems," *Optimization Days*, University of Quebec, Montreal, May 1981.
3. I.R. Petersen and C.V. Hollot, "A Riccati Equation Approach to the Stabilization of Uncertain Linear Systems," *IEE Control '85*, Cambridge, England, July, 1985.
4. C.V. Hollot, "Matrix Uncertainty Structures for Robust Stability," *Proceedings of the American Control Conference*, Boston, 1985.
5. C.V. Hollot and A.R. Galimidi, "Stabilizing Uncertain Systems: Recovering Full State Performance Via an Observer," *Proceedings of the American Control Conference*, Seattle, 1986.
6. C.V. Hollot, "Stabilizing Uncertain Linear Systems Via Dynamic Output Feedback," *Proceedings of the American Control Conference*, Seattle, 1986.
7. I.R. Petersen and C.V. Hollot, "Using Observers in the Stabilization of Uncertain Linear Systems and in Disturbance Rejection Problems," *Proceedings of the Conference on Decision and Control*, Athens, Greece, 1986.
8. C.V. Hollot and A.C. Bartlett, "Eigenvalue Locations for a Family of Matrices," *Proceedings of the International Symposium on Circuits and Systems*, Philadelphia, 1987.
9. A.C. Bartlett, C.V. Hollot and L. Huang, "Root Locations of an Entire Polytope of Polynomials: It Suffices to Check the Edges," *Proceedings of the American Control Conference*, Minneapolis, 1987.
10. M. Arabacioglu and C.V. Hollot, "*l*th-Step Lyapunov Min-Max Controller: Stabilizing Discrete-Time Systems under Real Parameter Variations," *Proceedings of the American Control Conference*, Minneapolis, 1987.
11. C.V. Hollot and A.C. Bartlett, "On the Eigenvalues of Interval Matrices," *Proceedings of the Conference on Decision and Control*, Los Angeles, 1988.
12. C.V. Hollot, D.P. Looze and A.C. Bartlett, "Unmodeled Dynamics: Performance and Stability Via Parameter Space Methods," *Proceedings of the Conference on Decision and Control*, Los Angeles, 1987.
13. I.R. Petersen and C.V. Hollot, "High Gain Observer Approach to the Stabilization of Uncertain Linear Systems," *IFAC Working Group on Robust Control*, Tegernsee, 1987.
14. C.V. Hollot, "Simultaneous Stabilization: An Application of Kharitonov-like Results," *Proceedings of the American Control Conference*, Atlanta, 1988.
15. T. E. Djaferis and C.V. Hollot, "Characterization of the Hurwitz Region for Systems with Parametric Uncertainty," *Proceedings of the American Control Conference*, Atlanta, 1988.
16. I.R. Petersen and C.V. Hollot, "High Gain Observers Applied to Problems in the Stabilization of Uncertain Linear Systems, Disturbance Attenuation and  $H_\infty$  Optimization," *Proceedings of the American Control Conference*, Atlanta, 1988.



17. C.V. Hollot, "Markov's Theorem of Determinants and the Stability of Families of Polynomials," *Proceedings of the International Workshop on Robustness in Identification and Control*, Torino, Italy, 1988.
18. T.E. Djaferis and C.V. Hollot, "Parameter Partitioning via Shaping Conditions for the Stability of Families of Polynomials," *Proceedings of the American Control Conference*, Atlanta, 1988.
19. C.V. Hollot, "On Markov's Theorem: It's Like Kharitonov's but Twice as Nice," *Proceedings of the IEEE Conference on Decision and Control*, Austin, 1988.
20. C.V. Hollot and W. E. Schmitendorf, "Simultaneous Stabilization via Linear State Feedback," *Proceedings of the IEEE Conference on Decision and Control*, Austin, 1988.
21. C.V. Hollot, "Kharitonov-Like Results in Design," *IFAC Working Group on Robust Control*, Jerusalem, March, 1989.
22. C.V. Hollot, "Polynomial Families with Multilinear Parameters," *IFAC Working Group on Robust Control*, Jerusalem, March, 1989.
23. C.V. Hollot, "Kharitonov-Like Results in Lyapunov Theory," *IFAC Working Group on Robust Control*, Jerusalem, March, 1989.
24. C.V. Hollot and Z.L. Xu, "When is the Image of a Multilinear Mapping a Polytope?" *SIAM Conference on Control in the 90's: Achievements, Opportunities, and Challenges*, San Francisco, May, 1989.
25. D. S. Bernstein and C.V. Hollot, "Robust Stability of Sampled-Data Control Systems," *Workshop on Control of Uncertain Systems*, Bremen, FRG, June, 1989, also in *Proceedings of the American Control Conference*, Pittsburgh, 1989.
26. C.V. Hollot, L. Huang and Z.L. Xu, "Designing Strictly Positive Real Transfer Functions Families: A Necessary and Sufficient Condition for Low Degree and Structured Families," *Proceedings of the International Symposium on the Mathematical Theory of Networks and Systems*, Amsterdam, June, 1989.
27. C.V. Hollot and F. Yang, "Robust Stabilization of Interval Plants," *Proceedings of the IEEE Conference on Decision and Control*, Tampa, 1989.
28. C.V. Hollot and W.E. Schmitendorf, "Robust Stabilization for Systems Having Parametric Uncertainties and RHP Zeroes," *Proceedings of the IEEE Conference on Decision and Control*, Tampa, 1989.
29. J. Ackermann, C.V. Hollot, R. Tempo and H. Hu, "On Extreme-Point Results for Time-Delay Systems," *Proceedings of the American Control Conference*, San Diego, 1990.
30. C.V. Hollot, F.J. Kraus, R. Tempo and B.R. Barmish, "Extreme Point Results for Robust Stabilization of Interval Plants with First Order Compensation," *Proceedings of the American Control Conference*, San Diego, 1990.
31. L. Huang, Z. L. Xu and C.V. Hollot, "Robust Analysis of Strictly Positive Real Function Set," *Proceedings of the Second Japan-China Joint Symposium on Systems, Control Theory and Its Applications*, Osaka, 1990.
32. P. Padmanabhan and C.V. Hollot, "Complete Instability of a Box of Polynomials," *Proceedings of the Allerton Conference*, University of Illinois, 1990.

33. C.V. Hollot and Y. Chait, "A Comparison Between  $H_\infty$  Methods and QFT for a SISO Plant with Both Plant Uncertainty and Performance Specifications," *Proceedings of the Winter Meeting of the ASME*, Dallas, 1990.
34. B.R. Barmish, C.V. Hollot and R. Tempo, "An Extreme Point Result for Robust Stability of a Diamond of Polynomials," *Proceedings of the Conference on Decision and Control*, Hawaii, 1990.
35. C.V. Hollot and R. Tempo, "On the Nyquist Envelope of an Interval Plant Family," *Proceedings of the American Control Conference*, Boston, 1991.
36. C.V. Hollot, H. Hu, R. Tempo and J. Ackermann, "Absence of Extreme-Point Results in Sampled-Data Control Systems," *Proceedings of the European Control Conference*, Grenoble, 1991.
37. C.V. Hollot and H. Hu, "Robustness of Sampled-Data Systems Having Parametric Uncertainty: A Conic Sector Approach," *IEEE Conference on Decision and Control*, Brighton, 1991.
38. C.V. Hollot, "Extreme-Point Results in Robust Control – Legacy of Kharitonov's Theorem," Plenary Talk, *11th Benelux Meeting*, Veldhoven, The Netherlands, 1992.
39. C.V. Hollot, "Robust Stabilization -- Getting Both Gain and Phase Into the Picture," *FIAT Distinguished Lecture Series*, Torino, Italy, 1992.
40. C.V. Hollot, "Extreme-Point Results in Robust Control," *Robust Control Theory Workshop*, Institute for Mathematics and Its Applications, Minneapolis, 1992.
41. C.V. Hollot and R. Tempo, "New Vertex Results on  $H_\infty$  Performance of Interval Plants and Interval Feedback Systems," *Proceedings of the IEEE Conference on Decision and Control*, Tuscon, 1992.
42. C.V. Hollot and R. Tempo, " $H_\infty$  Performance of Interval Plants: Necessary Conditions," *Proceedings of the American Control Conference*, San Francisco, 1993.
43. S.K. Ahmed and C.V. Hollot, "Robust Control of a Flexible System - Covering Parametric Uncertainty with a Non-Parametric Model," *Proceedings of the American Control Conference*, San Francisco, 1993.
44. H. Hu and C.V. Hollot, "Boundedness of the  $L_2$ -Induced Norm Implies Quadratic Stability for Uncertain Sampled-Data Control Systems," *Proceedings of the American Control Conference*, San Francisco, 1993.
45. C.V. Hollot, P. Padmanabhan and W. Siegl. "Solving Robust Pole Placement Problems with Linear Programming," *Proceedings of the World IFAC Congress*, Sydney, 1993.
46. P. Padmanabhan and C.V. Hollot, "Stability of Interval Matrices," *Proceedings of the World IFAC Congress*, Sydney, 1993.
47. C.V. Hollot, R. Tempo, L. Guzzella, F. Kraus and M. Mansour, "New Vertex Results in Establishing the Strict Positive Realness of Weighted Interval Systems," *Proceedings of the World IFAC Congress*, Sydney, 1993.
48. F. Yang and C.V. Hollot, "Robust Stabilization: A Piece of Cake," *Proceedings of the IEEE Conference on Decision and Control*, San Antonio, 1993.
49. P. Padmanabhan and C.V. Hollot, "Quadratic Stability of Interval Matrices," *Proceedings of the IEEE Conference on Decision and Control*, San Antonio, 1993.

50. E.G. Eszter and C.V. Hollot, "Robustness Under Combined Norm-Bounded and Positive-Real Structured Uncertainty," *Proceedings of the IEEE Conference on Decision and Control*, Lake Buena Vista, FL, 1994.
51. B.R. Barmish, C.A. Floudas, C.V. Hollot and R. Tempo, "Robust Stability of Matrices: A Global Linear Programming Solution," *Proceedings of the Allerton Conference on Computing and Control*, Monticello, 1994.
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### **Patents**

1. United States Patent 7,085,236, *Active queue management for differentiated services*, O. Salomon, W. Gong, C. V. Hollot, D. Towsley, V. Misra, Y. Chait, 2006.

## SEMINARS

1. "On the Robotics Laboratory at the University of Massachusetts," *EE Department, West Virginia University*, October, 1986.
2. "On the Stability and Zeros of Boxes and Poytopes of Polynomials", *Department of Mathematics, University of Massachusetts*, April, 1987.
3. "Robust Stabilization of Interval Plants Using Lead or Lag Compensators," *ECE Department, Northeastern University*, December, 1988.
4. "When is the Image of a Multilinear Function a Polytope?" *ECE Department, University of Wisconsin-Madison*, December, 1988.
5. "Xerographic Process Controls," *Xerox Corporation, Webster, NY*, March, 1989.
6. "Designing SPR-Invariant Transfer Function: A Means for Constructing Output-Error Identification Scheme for Partially Known Systems," *ME Department, University of California-Irvine*, February, 1989.
7. "Designing SPR-Invariant Transfer Function: A Means for Constructing Output-Error Identification Scheme for Partially Known Systems," *EE Department, Technion, Haifa*, March, 1989.
8. "Robust Stabilization of Interval Plants Using Lead or Lag Compensators," *Automatic Control Laboratory, ETH-Zurich*, July, 1989.
9. " $H_\infty$  Performance of Interval Feedback Systems," *Automatic Control Laboratory, Catholic University at Louvain-la-Neuve, Belgium*, November, 1991.
10. "Are All Important Loop Properties of an Interval Feedback System Deducible from the Vertex Systems?" *Automatic Control Laboratory, University of Grenoble*, January, 1992.
11. " $H_\infty$  Performance of Interval Feedback Systems," *Automatic Control Laboratory, University of Grenoble*, January, 1992.
12. "Are all Important Loop Properties of an Interval Feedback System Deducible from the Vertex Systems?" *Automatic Control Laboratory, Catholic University at Louvain-la-Neuve, Belgium*, January, 1992.
13. "Le Theoreme de Rantzer sur les Directions Convexe ne Sonne pas le Glas de Resultats au Sommets," *Automatic Control Laboratory, Catholic University at Louvain-la-Neuve, Belgium*, April, 1992.
14. "Rantzer's Convex Direction Theorem: Is it the Death Knell for New Polynomial Vertex Results?," *ETH-Zurich*, June, 1992.
15. "Quadratic Stability and  $H_\infty$  Control Theory for Sampled-Data Control Systems," *Politecnico di Torino*, November, 1992.
16. "Robust Stabilization of Systems Having Sector-Like Uncertainty," *Politecnico di Torino*, September, 1993.
17. "Robust Stabilization: A Piece of Cake," *LEMS, Brown University*, April, 1994.
18. "System Robustness and Global Linear Programming," *MIE Department, UMass-Amherst*, November, 1995.
19. "Torque Assist and Motor Torque Disturbance Attenuation in an EPS System," *Advanced Product Systems, GM, Saginaw*, January, 1998.
20. "Congestion Avoidance in the Internet and Control Engineering," *ECE Department, The University of Michigan*, March, 2001.



## FUNDING

1. PI, *Stabilization of Uncertain Systems*, University of Massachusetts, July 1, 1985-June 1, 1986, \$2400.
2. Co-PI, *Application of Intelligent/Robust Strategies for the Control of Nonlinear Drive Systems*, GE Pittsfield KESLE Program, August 1986-May 1987, T.E. Djaferis (Co-PI), \$25,000.
3. Continuation of the above grant, August 1987-May 1988, \$25,000.
4. PI, *Designing Robust Systems: Exploiting the Structure of Uncertainty*, NSF, September 1986-February 1988, \$17,102.
5. Co-PI, *Compliant Motion Control*, Martin Marietta, August 1986-December 1986, T.E. Djaferis (Co-PI), \$20,000.
6. Continuation of above grant, February 1987-November 1987, \$20,000.
7. Continuation of above grant, April 1988-November 1988, \$20,000.
8. PI, *High Volume Produce Xerographic Process and Copy Quality Control Algorithm*, Xerox, January 1988-December 1988, \$3000.
9. Continuation of above Grant, March 1988, \$6000.
10. PI, *PYI*, NSF, October 1988, \$54,000.
11. Co-PI, *Servo Control of Robotic Manipulator*, Martin Marietta, February, 1989-February, 1990, T.E. Djaferis (Co-PI), \$20,000.
12. PI, *PYI Continuation*, NSF, October, 1989, \$62,500.
13. Co-PI, *Advanced Avionics Technology*, Martin Marietta, September 1989-November 1989, T.E. Djaferis (Co-PI), \$20,000.
14. PI, *Equipment Grant*, Digital Equipment Corporation, 1989, \$37,500.
15. PI, *PYI Continuation*,” NSF, 1990, \$62,500.
16. Co-PI, *Neural Networks for Adaptive Control*, NSF, 3 years, A.G. Barto (PI) and B.E. Ydstie (Co-PI), \$660,000.
17. PI, *Controls Structures Interaction Experiment for Large Space Structures*, Martin-Marietta, April 1992 - April 1993, T.E. Djaferis (Co-PI), \$20,000.
18. PI, *PYI Continuation*,” NSF, 1991, \$62,500.
19. PI, *PYI Continuation*,” NSF, 1992, \$25,000.
20. Co-PI, *Reset Control for High-Performance Electro-Mechanical Systems*, NSF, April, 1998 -- March 2001 Y. Chait (PI), \$209,733.
21. PI, *Application of Multivariable Control in Multiple Axes Pedestals*, Kollmorgen, EO Division, September, 1998 - August, 1999, Y. Chait, (Co-PI), and T.E. Djaferis (Co-PI), \$48,000.
22. Co-PI, *REU Supplement to NSF Award: Reset Control for High-Performance Electro-Mechanical Systems*, (1 year), Y. Chait (PI), \$10,450.
23. Co-PI, *Rapid Prototyping of DSP-Based Control Systems*, (8 months), Y. Chait (PI) and T. Djaferis (Co-PI), \$34K, (under NSF GOALI: *Integrating Industry Perspective into University Research by Creating Teams of Academic-Industry Technology Specialists*, November, 1999, 18 months duration, J. Goldstein, L. Slakey, T. Strzempko (PIs)).
24. PI, *Implementation of Rapid Prototyping of DSP-Based Control Systems*, (8 months), Y. Chait (Co-PI) and T. Djaferis (Co-PI), \$25K, anticipated January 2002, (under NSF GOALI: *Integrating Industry Perspective into University*

- Research by Creating Teams of Academic-Industry Technology Specialists*, J. Goldstein, L. Osterweil and T. Strzempko (PIs)).
25. PI, *Scalable AQM Routers Supporting Heterogeneous Traffic*, Y. Chait, and V. Misra (Co-PIs), NSF, 3 years, \$334,753, Sept 15, 2002.
  26. Co-PI, *Enhanced DSP Code Generation Tools*, Kollmorgen, T. Djaferis (PI), Y. Chait (Co-PI), July 2003 – December 2003, \$48,000
  27. Co-PI, *Collaborative Research ---- Master-Slave Clock Networks: Modeling, Analysis and Neurobiology*, NSF IIS-0422886 H. Siegelmann (PI), Y. Chait, E. Bittman and M. Harrington, September 2004 – March 2007, \$48,000.
  28. Co-PI, *Dynamics of the Human Thyroid: Towards Clinical Applications*, Yossi Chait (PI), and Stuart R. Chipkin, NSF CMS-0556081, September 2006 – August 2009, \$209,593.