

SANJOY K. MITTER
Professor of Electrical Engineering
Massachusetts Institute of Technology

ADDRESS

MIT
Room 32-D562
77 Massachusetts Avenue
Cambridge, MA 02139
Tel: (617) 253-2160 Fax: (617) 258-8364

EDUCATION

1954 B.S., Mathematics, Calcutta University, India
1957 B.Sc., Engineering, ACGI, Imperial College of Science and
Technology, London
1965 Ph.D., Electrical Engineering, Imperial College, London
Thesis: *Function Space Methods in Optimal Control with Applications to Power
Systems*

FIELDS OF INTEREST

*Mathematical Theory of Systems and Control, Stochastic Dynamical Systems and
Their Role in Filtering and Control; Mathematical Physics and its Relationship to
System Theory; Image Analysis and Vision; Structure, Function and Organization of
Complex Systems.*

AWARDS

1962-1965 Central Electricity Board Research Fellow, Imperial College,
London
1979 IEEE Fellow
1988 Member, National Academy of Engineering
2000 IEEE Control Systems Award
2003 Foreign Member, Istituto Veneto di Scienze, Lettere ed Arti
2007 AACC Richard E. Bellman Control Heritage Award
4/2012 Ulam Scholar at the Los Alamos National Laboratory
5-7/2012 John von Neumann Visiting Professor in Mathematics at the
Technical University of Munich, Germany

PROFESSIONAL EXPERIENCE

9/57-2/61 Development Engineer, Brown Boveri and Co., Ltd.,
Baden, Switzerland
3/61-10/62 Research Engineer, Battelle Memorial Institute,
Geneva, Switzerland
6/62-8/65 Central Electricity Board Research Fellow,
Imperial College, London, England
9/65-7/67 Assistant Professor and Member of Systems Research Center,
Case Institute of Technology

7/67-9/69 Associate Professor and Member of Systems Research Center,
Case Western Reserve University
9/69-6/70 Visiting Associate Professor, MIT
7/70-6/73 Associate Professor of Electrical Engineering, MIT
7/73-present Professor of Electrical Engineering, MIT
9/81-8/86 Director, Laboratory for Information and Decision Systems,
MIT
1986-1996 Professore Ordinario, Scuola Normale Superiore, Pisa, Italy
9/86-6/99 Co-Director, LIDS, MIT
10/86-7/2000 Director, Center for Intelligent Control Systems, MIT

SHORT TERM APPOINTMENTS

2002-06 Chair, Int'l Advisory Committee, Scuola Normale Superiore, Pisa,
Italy
12/70 Visiting Professor, Institut de Recherches d'Informatique et
d'Automatique,
Versailles, France
6/72-8/72 Science Research Council Senior Visiting Fellow,
Imperial College, London, England
9/73-2/74 Visiting Professor, Technische Universität, Berlin
3/74 Dutch National Science Foundation Lecturer in Applied Mathematics,
University of Groningen, Eindhoven and Twente
3/74-7/74 CNR Visiting Professor, Laboratorio per Ricerche di Dinamica dei
Sistemi e di Elettronica Biomedica, Padova, Italy
7/76 Visiting Professor, University of Groningen, Holland
6/77 Visiting Professor, Department of Systems Science and Mathematics,
Washington University, St. Louis, Missouri
12/77 Visiting Professor, Department of Electrical Engineering,
University of Maryland
7/77 Visiting Professor, School of Mathematics,
Tata Institute of Fundamental Research, Bombay, India
1/81-7/81 Visiting Professor, University of Florence, Mathematics Institute
3/2000 McKay Professor, Dept. of Electrical Engineering & Computer Science,
University of California, Berkeley, CA.
9/2003 Russell-Severance-Springer Chair, Dept. of Electrical Engineering &
Computer Science, University of California, Berkeley, CA.

CONTRIBUTIONS TO PROFESSIONAL SOCIETIES, INDUSTRY, GOVERNMENT

Organization Membership and Activities

1968-1970 Chairman, IEEE, Technical Committee on Computational Methods
and Distributed Systems, IEEE Professional Group on Automatic
Control
1969-1973 Member, ADCOM, IEEE Control Systems Society
1971 Member, Organizing Committee of Conference entitled "Future Power
Systems--Reliability, Research Regulation," organized by National
Science Foundation and the Engineering Research Foundation, August
1971

1971 Program Chairman, 1st IEEE Decision & Control Conf., Miami Beach, Florida

12/71 Guest Associate Editor, special issue of *Transactions on Automatic Control* entitled Linear, Quadratic Gaussian Problem

1/72 Guest Co-editor, special issue, Proceedings of IEEE entitled Computers in Design

1977-1980 Chairman, AACC Theory Committee

1977-1981 SIAM Representative, AACC Awards Committee

1978-1983 Member, IEEE Control Systems Awards Committee

1979-1982 SIAM Representative, AMS-SIAM Joint Committee on Applied Mathematics

2/78 Organizer and Chairman of Session, "Can Mathematics be Applied to the Social Sciences?," Annual Meeting of AAAS, Washington, D.C.

1982-1983 Panel Member, Decision and Management Science Program, NSF

1985 Review Panel Member, Presidential Young Investigator Awards (Systems Theory and Operations Research Program), NSF

1986-1987 Member, Panel on Future Directions in Control Theory, NSF

1986-1989 Member, Committee on Recommendations for U.S. Army Basic Research

1988 Co-organizer, Summer Program on Signal Processing, Institute for Mathematics and Its Applications, Minneapolis.

1988-1989 Member, Program Committee, 1988 International Conference on Advances in Communications, Signal Processing and Control.

1989 Member, Program Committee, International Symposium on the Mathematical Theory of Networks and Systems (MTNS-89).

1991-1995 Member, Advisory Committee, Army High Performance Computing Research Center, University of Minnesota.

1992-1998 Member, Science Council, ICASE, NASA, Langley.

1992-1996 Associate Editor at Large, IEEE Transactions on Automatic Control

1999 Chairman, Review Committee for Division of Mathematics and Information Sciences, Army Research Office

1999 Panel Member, Evaluation of NSF-KDI Proposals.

Editorial Boards of Journals and Book Series in Engineering and Applied Mathematics:

Current:

Communications in Information and Systems
 Journal of Applied Mathematics & Optimization
 Nonlinear Analysis
 Progress in Systems and Control (book series)

Formerly:

Acta Applicandae Mathematica
 Circuits, Systems, and Signal Processing

IEEE Transactions on Automatic Control
Mathematics of Systems, Control and Signal Processing
Sankhya
Systems and Control Letters

Consultant

1966-1970	Cleveland Electric Illuminating Company, Cleveland, OH.
1972-1976	C.S. Draper Laboratories, Cambridge, MA.
1976-1987	Scientific Systems, Inc., Cambridge, MA.
1979-1980	IBM Watson Research Laboratory, Yorktown Heights, NY.
1988-1992	Director, Softron, Inc., Waltham, MA.
1992-1994	C.S. Draper Laboratories, Cambridge, MA
1992-1998	ICASE, NASA Langley
1996-present	Scientific Systems Company, Inc., Cambridge, MA.

THESES SUPERVISED BY SANJOY K. MITTER

S.B. Theses

1. Lockhart, Thomas W., "A Model for Prediction of Course Six Core Course Registration," June 1972.
2. Crosby, Richard S., "Monte Carlo Methods for Lattice Fields", MIT, Department of Electrical Engineering and Computer Science, June 1989.
3. Jablonski, David A., "Visualization of Lattice Fields", MIT, Department of Electrical Engineering and Computer Science, June 1989.
4. Tatikonda, Sekhar C., "Identification of Linear Systems in Noisy Data", MIT, Department of Electrical Engineering and Computer Science, June 1993.

S.M. Theses

1. Kreiff, J., "Multi-level Control of Linear Systems," Case Western Reserve University, January 1968.
2. Delfour, Michel C., "Generalized Controllability for Perturbed Linear Systems," Case Western Reserve University, June 1968.
3. Celada, C. A., "Solution of a Two Stage Inventory Problem Using Decomposition Techniques," February 1972.
4. Spector, Victor A., "Choosing a Quadratic Cost Criterion in the Frequency Domain," February 1972.
5. Sartori di Borgoricco, Eugene, "Stabilization of an Unstable System by Means of Finite Memory Feedback," January 1973.
6. Halliday, John S., "The Characterization of Vector Cardiograms for Pattern Recognition," June 1973.
7. Djaferis, Theodore E., "Exact Solution to Lyapunov's Equation Using Algebraic Methods," February 1977.
8. Doyle, John C., "Information Theory and Reduced Order Filtering," June 1977 (also used for S.B. degree).
9. Toldalagi, Paul M., "Estimation and Variational Methods for Gradient Algorithm Generation," June 1977.
10. Flamm, David S., "A Conceptual Proof of Rosenbrock's Pole Assignment Theorem," September 1977.
11. Vallot, Lawrence, "Filtering for Bilinear Systems," June 1981.
12. Gelfand, Saul, "A nonparametric multiclass partitioning method for classification," MIT, 1982.
13. Akra, Mohamed A., "On the Analysis of the Hopfield Network: A Geometric Approach," September 1988.
14. Casadei, Stefano, "Multiscale Image Segmentation by Dishomogeneity Evaluation and Local Optimization", MIT, Department of Electrical Engineering and Computer Science, June 1991.
15. Chiang, Kenneth H., "Fuzzy Logic Mode Selection for a Recuperative Turboshaft Engine", MIT, Department of Electrical Engineering and Computer Science", June 1992.
16. Judish, Nathan P., "Polygonal Random Fields and the Reconstruction of Piecewise Continuous Functions," January 1993.
17. Cerrato, Dean E., "Modeling Unknown Dynamical Systems using Adaptive Structure Networks", MIT, Department of Electrical Engineering and Computer Science, June 1993.

18. Chaudhari, Upendra.V. "Complexity Issues Dealing with Networks that Compute Boolean Functions," MIT, May 1993.
19. Lomelin, Mauricio, "Character Template Estimation from Document Images and Their Transcriptions," May 1995 (with Kopec, PARC).
20. Sahai, Anant, "Handwritten Character Recognition using the Minimum Description Length Principle," May 1996.
21. Chu, Maurice, "Target Breakup Detection in the Multiple Hypothesis Tracking Formulation," June 1996. (MEng, with Dunn)
22. Sekhar, Tatikonda, "Curve Reconstruction Via Line Intersection Tomography", January 1995.
23. Bazzi, Louay, "Robust Algorithms for Model-Based Object Recognition and Localization," February 1999.
24. Jones, Peter, "Cooperative Dynamic Scheduling in Heterogeneous Sensor Networks" May 2005.
25. Chawla, Aman, "Reliability of a Gaussian Channel in the Presence of Gaussian Feedback," June 2006.
26. Varshney, Lav R., "Optimal Information Storage Nonsequential Sources and Neural Channels," June 2006.

Ph.D Theses

1. Simon, J.D., "Theory and Applications of Modal Control," Case Western Reserve University, June 1967. (Exxon Research Laboratories, New Jersey)
2. Kiang, W.L., "Two-level Linear Dynamical Systems," Case Western Reserve University, January 1968.
3. DyLiacco, T.E., "Control of Power Systems Via the Multi-level Concept," Case Western Reserve University, June 1968. (Formerly at Cleveland Illuminating Company; now consultant)
4. Phillipson, G.A., "The State Identification of a Class of Distributed Parameter Systems," Case Western Reserve University, June 1968. (Shell Development Company, Houston, Texas)
5. Heins, W., "Conjugate Convex Functions, Duality and Optimal Control Problems," Case Western Reserve University, January 1969. (Technical University, Delft, Holland)
6. Kershberg, L., "Algebraic Theory of Linear Systems," Case Western Reserve University, June 1969. (AT&T Bell Laboratories, New Jersey)
7. Licht, B., "Approximate Nonlinear Filtering," Case Western Reserve University, January 1970. (Cleveland State University, Cleveland, Ohio)
8. Delfour, M.C., "Hereditary Differential Systems Defined on a Compact Interval," Case Western Reserve University, June 1970. (Professor, University of Montreal, Canada)
9. Vlahutin, P., "Transient Stability of Power Systems," Case Western Reserve University, January 1971
10. Blankenship, Gilmer L., "Stability of Uncertain Systems," MIT, June 1971. (Professor, University of Maryland, College Park, Maryland)
11. Vandevenne, H.F., "Qualitative Properties of a Class of Infinite Dimensional Systems," MIT, February 1972. (Lincoln Laboratory, MIT)

12. Eckberg, Adrian E., "Algebraic System Theory with Applications to Decentralized Control," MIT, June 1973. (AT&T Bell Laboratories, Holmdel, NJ)
13. Johnston, Robert deB., "Linear Systems over Various Rings," MIT, June 1973. (Bell Northern Research Laboratories, Montreal, Canada)
14. Hager, W., "Rates of Convergence for Discrete Approximations to Optimal Control Problems," MIT, June 1974 (MIT Mathematics Department). (Professor, University of Florida, Gainesville, Florida)
15. Horowitz, Larry L., "Optimal Filtering of Gyroscopic Noise," MIT, June 1974. (Lincoln Laboratory, MIT)
16. Warren, Michael E., "On the Decoupling of Linear Multivariable Systems," MIT, June 1974. (University of Florida, Gainesville, Florida)
17. Galdos, Jorge I., "Information and Distortion in Filtering Theory," MIT, February 1975. (Lincoln Laboratory, MIT)
18. Platzman, Loren K., "Finite Memory Estimation and Control of Finite Probabilistic Systems," MIT, February 1977. (Georgia Institute of Technology, Atlanta, Georgia)
19. Akant, Adnan, "Segmented Approximation and Analysis of Stochastic Processes," MIT, June 1977. Fischer, Francis, Trees and Watts, New York
20. Young, S.K., "Convexity and Duality in Optimization Theory," MIT, July 1977 (MIT Mathematics Department). (Science Applications, Inc., McLean, Virginia)
21. Djaferis, Theodore, "Generalized Pole Assignment by Output Feedback and Solution of Linear Matrix Equations from an Algebraic Viewpoint," MIT, September 1979. (Associate Professor, University of Massachusetts, Amherst, Massachusetts)
22. Hildebrant, Richard R., "Scheduling and Flexible Machining Systems when Machines are Prone to Failure," MIT, May 1980 (MIT Department of Aeronautics and Astronautics). (C.S. Draper Laboratories, Cambridge, Massachusetts)
23. Ocone, Daniel L., "Topics in Non-linear Filtering Theory," MIT, May 1980 (MIT Mathematics Department). (Associate Professor, Rutgers University, New Brunswick, New Jersey)
24. Propp, Michael B., "The Thermodynamic Properties of Markov Processes," MIT, January 1985. (President, Adaptive Networks, Inc., Cambridge, Massachusetts)
25. Avniel, Yehuda, "Realization and Approximation of Stationary Stochastic Processes," MIT, May 1985 (Mitre Corporation, MA)
26. Marroquin, Jose Luis, "Probabilistic Solution of Inverse Problems," MIT, September 1985. (Professor, CIMAT, Mexico)
27. Flamm, David S., "Control of Delay Systems for Minimax Sensitivity," June 1986. (SRI, Palo Alto, California)
28. Gelfand, Saul, "Analysis of Simulated Annealing Type Algorithms," MIT, February 1987. (Professor, Purdue University)
29. Richardson, Thomas J., "Scale Independent Piecewise Smooth Segmentation of Images Via Variational Methods," MIT, February, 1990. (Chief Scientist and Vice President, Qualcomm-Flarion, Inc.; previous: Lucent, Bell Labs, Murray Hill, NJ)
30. Schick, Irvin, "Robust Recursive Estimation of the State of a Discrete-Time Stochastic Linear Dynamics System in the Presence of Heavy-Tailed Observation Noise," (in the Department of Mathematics and Applied Mathematics).

31. Kulkarni, Sanjeev R., "Problems of Computational and Information Complexity in Machine Vision and Learning," MIT, July 1991. (Professor, Princeton University)
32. Akra, Mohamad, "Automated Text Recognition, MIT, August 1993. (Professor, American University, Beirut, Lebanon)
33. Eide, Ellen Marie, "A Linguistic Feature representation of the Speech Waveform," MIT, September 1993. (Research Staff, IBM, Watson Research Center)
34. Casadei, Stefano. "Robust Detection of Curves in Images," MIT, June 1995.
35. Chaudhari, Upendra V., "Probabilistic Pursuit, Classification, and Speech," LIDS-TH-2399, September 1997.
36. Branicky, Michael S. "Studies in Hybrid Systems: Modeling, Analysis, Control," MIT, June 1995 (Associate Professor, Case Western Reserve University)
37. Tatikonda, Sekhar; "Control Under Communication Constraints," September 2000. (Associate Professor, Yale University)
38. Sahai, Anant; "Anytime Information Theory," November 2000. (Associate Professor, University of California at Berkeley)
39. Chu, Maurice, "A Hierarchical Framework for Constructing Computationally Efficient Algorithms for Distributed Inference Problems," February 2003. (Parc, Inc., CA)
40. Sigurd, Karin, "Reconfiguration Control in Adaptive Networks," June 2003. (ABB, Switzerland)
41. Bazzi, Louay, "Minimum Distance of Error Correcting Codes versus Encoding Complexity, Symmetry, and Pseudorandomness," September 2003. (Associate Professor, Amer. U of Beirut, Lebanon)
42. Srinivasan, Lakshminarayan, "From Thought to Action," MIT-Harvard combined thesis, September 2006 (co-advised with E. Brown, Harvard Medical School)
43. Copeland, Andrew, "Spatio-Temporal Data Fusion in Cerebral Angiography," 2007.
44. Varshney, Lav, "Unreliable and Resource-Constrained Decoding," June 2010 (co-supervised with V. Goyal).
45. Jones, Peter, "Coherent Approximation of Distributed Expert Assessments," June 2011 (co-supervised with V. Saligrama).
46. Ohannessian, Mesrob, "On Inference about Rare Events," February 2012 (co-supervised with M.A. Dahleh).
47. Agarwal, Mukul, "A universal, operational theory of multi-user communication with fidelity criteria," February 2012.

Ph.D. Theses: Reader (incomplete listing)

1. Glover, John D., "Control of Systems with Unknown but Bounded Disturbances with Application to the Load Frequency Control of Electric Power Systems," February 1971.
2. Tavernier, Hubert M., "Dynamic Linear Programming," February 1971.
3. Bertsekas, Dimitri P., "State Estimation and System Control for a Set-membership Description of Uncertainty," June 1971.
4. Galiana, Francisco D., "An Application of System Identification and State Prediction to Electric Load Modelling and Forecasting," June 1971.

5. McGarty, Terrance P., "Multiple Scatter Communication Channels," June 1971.
6. Geering, Hans P., "Optimal Control Theory for Non-Scalar-Valued Performance Criteria," September 1971.
7. Prado, Gervasio, "Optimal Sensor Location in Distributed Parameter Systems," September 1971.
8. Johnson, Timothy L., "Optimal Control of First-Order Distributed Systems," June 1972.
9. Lee, Stephen T., "Transient Stability Equivalents for Power System Planning," June 1972.
10. Masiello, Ralph D., "Adaptive Modelling and Control of Electric Power Systems," February 1973.
11. Chong, Chee-Yee, "On the Decentralized Control of Large-Scale Systems," June 1973.
12. Gruhl, James, "Minimizing Cost and Environment Impact on Electric Power System Operation," June 1973.
13. Willner, Dieter, "Observation and Control of Partially Unknown Systems," June 1973.
14. Wood, Jonathan R., "Aspects of Network Theory," June 1973.
15. Albuquerque, Jose P. A., "Model Sensitivity in Random Process Identification Performance," September 1973.
16. Glover, Keith, "Structural Aspects of System Identification," September 1973.
17. Marcus, Steven I., "Estimation and Analysis of Nonlinear Stochastic Systems," June 1975.
18. Kwong, Raymond H., "Structural Properties and Estimation of Delay Systems," September 1975.
19. Kam, Pooi Y., "Modeling and Estimation of Space-Time Stochastic Processes," February 1977.
20. Kohn, Wolf, "Distributed Hierarchical Automata with Some Applications to Genetics in Prokaryotes," September 1978.
21. Birdwell, John D., "Dynamic Structural Optimization and Related Aspects of Systems Reliability," June 1978.
22. Ledsham, William H., "Optimum Retrieval Techniques in Remote Sensing of Atmospheric Temperature, Liquid Water, and Water Vapor," June 1978.
23. Monauri, L.A., "Linear Dynamical Systems with Abstract State Spaces," September 1978.
24. Curlander, Paul J., "Quantum Limitations on Communication Systems," September 1979.
25. Triantafyllou, Michael, "Design of the Dynamic Positioning System of a Drilling Vessel," July 1979 (Professor, Ocean Engineering, MIT)
26. Teneketzis, Demosthenis, "Communication in Decentralized Control," January 1980.
27. Toldalagi, Paul M., "Adaptive Filtering Methods Applied to Satellite Remote Sensing of the Atmosphere for Meteorological Purposes," May 1980.
28. R. Pearson, "Velocity Feedback Control of Flexible Structures," February 1982.
29. Doerschuk, P.C., "Large-scale System Estimation Problems and Electrocardiogram Interpretation," May 1985.
30. Bordley, T.E., "Improved Paraxial Method for Modelling Underwater Acoustic Propagation," May 1985.

31. Yagle, A.E., "Layer-Stripping Solutions of Inverse Seismic Problems," May 1985.
32. Castineyra, I., "Routing in Unreliable Networks," June 1986.
33. Lee, W.H., "Robust Control Designs for Two Classes of Infinite Dimensional Systems," June 1986.
34. Lou, X.-C., "Time Scale Analysis Using Algebraic Approaches," February 1986.
35. Bunks, C.D., "Modelling for Interpretation and Analysis of Layered Data," February 1987.
36. Canny, John, "The Complexity of Robot Motion Planning," June 1987.
37. Lamb, Richard, "Parametric Non-Linear Filtering," June 1987.
38. Shamma, Jeff S., "Analysis and Design of Gain Scheduled Control Systems," May 1988.
39. Chou, Kenneth C., "A Stochastic Modeling Approach to Multiscale Signal Processing," June 1991.
40. Picard, Rosalind, "Texture Modeling; Temperature Effects on Markov/Gibbs Random Fields," June 1991.
41. Shapire, Robert, "The Design and Analysis of Efficient Learning Algorithms," February 1991.
42. Telatar, Emre, "Multi-Access communications with Decision Feedback Decoding," June 1992.
43. Sanger, Terence, "Theoretical Elements of Hierarchical Control in Vertebrate Motor Systems," September 1993.
44. Zanghi, Kambiz, "Optimal Feedback Control Formulation of the Active Noise Cancellation Problem," February 1994
45. Li, Ying, "Probabilistic Interpretations of Fuzzy Sets and Systems," September 1994.
46. Fieguth, P.W., "Application of Multiscale Estimation to Large Scale Multidimensional Imaging and Remote Sensing Problems," June 1995.
47. Tse, David, "Variable-rate Lossy Compression and Its Effects on Communication Networks," February 1995.
48. Elia, Nicola, "Computational Methods for Multi-Objective Control," September 1996.
49. Savari, Serap, "Variable-To-Fixed Length Codes for Sources with Known and Unknown Memory," February 1996.

Postdoctoral and Research Associates (incomplete listing)

1. Richard Vinter, Professor, Imperial College, London, England
2. Luciano Pandolfi, Professor, Polytechnic Institute of Turin, Turin, Italy
3. Giorgio Picci, Professor, University of Padova, Padova, Italy
4. Ettore Fornasini, Professor, University of Padova, Padova, Italy
5. Wolfgang Runggaldier, Professor, University of Padova, Padova, Italy
6. Hans Schumacher, Research Scientist, Math. Centrum, Amsterdam, Holland
7. Ramakrishna Akella, Professor, University of California, Santa Cruz
8. Antonio Moro, Associate Professor, University of Florence, Florence, Italy
9. Guillermo Sapiro (Professor, University of Minnesota)
10. Gilead Tadmor, Associate Professor, Northeastern University
11. Paul Dupuis, Professor, Brown University

12. Jeff S. Shamma, Professor, University of California at Los Angeles
13. Ofer Zeitouni, Professor, University of Minnesota
14. Denis Mustafa, Lecturer, Oxford University
15. Pietro Perona, Professor, California Institute of Technology
16. Sandro Zampieri, Professor, University of Padova
17. Peter Doerschuk, Professor, Cornell University
18. Michael Branicky, Associate Professor, Case Western Reserve University
19. Stefano Casadei, Private Consultant
20. Nicola Elia, Associate Professor, Iowa State University
21. Anthony Yezzi, Associate Professor, Georgia Institute of Technology
22. Abdol-Reza Mansouri, Assistant Professor, Queens University, Canada
23. Ather Gattami, Assistant Professor, Royal Institute of Technology, Stockholm, Sweden.
24. Haidong Yuan
25. Hariharan Narayanan, University of Washington, Seattle
26. Mukul Agarwal

PUBLICATIONS (Available on-line at <http://web.mit.edu/~mitter/www/>)

Books, Books Edited and Book Chapters

1. Mitter, S.K., L. Pun, and J. Peschon, "Computer Process Control," Chapter IX Disciplines and Techniques of Systems Control, Ed. J. Peschon. Blaisdell, January 1965.
2. Mitter, S.K., and Y.C. Ho (editors), *Directions in Large Scale Systems*. New York: Plenum Press, 1976.
3. Mitter, S.K., and G. Marchesini (editors), *Mathematical Systems Theory*, Udine 1975, Lectures Notes in Economics and Mathematical Systems. Managing Editors: M. Beckman and H.P. Kunzi. Systems Theory 131. Heidelberg, Germany: Springer-Verlag, 1976.
4. Mitter, S.K., and A. Moro (editors), *Nonlinear Filtering and Stochastic Control*. Springer Lecture Notes in Mathematics. Vol. 972. Berlin-New York: Springer-Verlag, 1983.
5. Auslander, L., T. Kailath and S.K. Mitter (editors), *Signal Processing, Part I: Signal Processing Theory*, New York: Springer-Verlag, 1990.
6. Bensoussan, A., Da Prato, G., Delfour, M.C. and Mitter, S.K., *Representation and Control of Infinite Dimensional Systems*, Vol. I, Birkhauser-Boston, 1992.
7. Bensoussan, A., Da Prato, G., Delfour, M.C. and Mitter, S.K., *Representation and Control of Infinite Dimensional Systems*, Vol. II (1993), Birkhauser-Boston.
8. Mitter, S.K. and Schick, I.C., "Point Estimation, Stochastic Approximation, and Robust Kalman Filtering," in *Systems, Models and Feedback: Theory and Applications*, eds. A. Isidori and T.J. Tarn, Birkhauser, pp. 127-152.
9. Gaveau, B., S.K. Mitter and C. Rockland, "Autonomy and Adaptiveness: A Perspective on Emergent Organisms," to be published by MIT Press.
10. Saligrama, V., M. Dahleh and S.K. Mitter, "Learning, Adaptation, and Decision Making with Finite Data," to be published by Princeton University Press.

Journal Papers

1. Mitter, S.K., "Successive Approximation Methods for the Solution of Optimal Control Problems," *Automatica*, 3:135-149, 1966. Proceedings of 3rd IFAC Congress, June 1966.
2. Lasdon, L.S., S.K. Mitter, and A.D. Waren, "The Conjugate Gradient Method for Optimal Control Problems," *IEEE Transactions on Automatic Control*, AC-12 (2): 132-38, April 1967.
3. Simon, J.D. and S.K. Mitter, "A Theory of Modal Control," *Information and Control*, 13 (4):316-53, October 1968.
4. Mitter, S.K., and J.D. Simon, "Synthesis of Transfer Function Matrices with Invariant Zeroes," Correspondence Item. *IEEE Transactions on Automatic Control*, AC-14 (4):420-21, August 1969.
5. Delfour, M.C. and S.K. Mitter, "Reachability of Perturbed Systems and Min-Sup Problems," *SIAM Journal on Control*, 7(4):521-33, November 1969.
6. Heins, W. and S.K. Mitter, "Conjugate Convex Functions, Duality and Optimal Problems (I): Systems Governed by Ordinary Differential Equations," *Information Science*, 2(2):211-43, 1970.

7. Mitter, S.K., and R. Foulkes, "Controllability and Pole-Assignment for Discrete Time Linear Systems Defined over Arbitrary Fields," *SIAM Journal on Control*, 9(1):1-7, February 1971.
8. Delfour, M.C. and S.K. Mitter, "Systemes d'equations Differentielles Hereditaires a Retards Fixes. Theorems d'existence et d'unicite," *Comptes Rendus Academie Sciences Paris*, February 1971, pp. 382-85.
9. Delfour, M.C. and S.K. Mitter, "Systemes d'equations Differentielles Hereditaires a Retards Fixes. Une Classes de Systemes Affines et le Probleme du Systeme Adjoint," *Comptes Rendus Academie Sciences Paris*, April 1971, pp. 1109-21.
10. Delfour, M.C. and S.K. Mitter, "Le Controle Optimal de Systemes Gouvernes par des Equations Differentielles Hereditaires Affines," *Comptes Rendus Academie Sciences Paris*, June 1971, p. 1715-18.
11. Mitter, S.K., and J.C. Willems, "Controllability, Observability, Pole Allocation and State Reconstruction," *IEEE Transactions on Automatic Control*, AC-16 (6):582-95, December 1971.
12. Delfour, M.C., and S.K. Mitter, "Controllability, Observability and Optimal Feedback Control of Affine Hereditary Differential Systems," *SIAM J. on Control*, 10: 298-238, May 1972.
13. Mitter, S.K., and M.C. Delfour, "Controllability and Observability for Infinite-Dimensional Systems," *SIAM J. on Control*, 10(2):328-333, May 1972.
14. Delfour, M.C. and S.K. Mitter, "Hereditary Differential Systems with Constant Delays I: General Case," *J. of Differential Equations*, 12(2):213-35, September 1972.
15. Mitter, S.K., "The Infinite Time Quadratic Cost Problem for Certain Classes of Infinite Dimensional Control Systems," *Delay and Functional Differential Equations and their Applications*, New York: Academic Press, 1972, pp. 269-80.
16. Bertsekas, D.P., and S.K. Mitter, "A Descent Numerical Method for Optimization Problems with Nondifferentiable Cost Functionals," *SIAM Journal on Control*, 11(4):637-52, November 1973.
17. Mitter, S.K., and M.E. Warren, "A Necessary Condition for Decoupling Multivariable Systems," *International Journal on Control*, 21(2):177-92, 1975.
18. Delfour, M.C., S.K. Mitter, and C. McCalla, "Stability and the Infinite-Time Quadratic Cost Problem for Linear Hereditary Differential Systems," *SIAM Journal on Control*, 13(1):48-88, January 1975.
19. Mitter, S.K., and M.E. Warren, "Generic Solvability of Morgan's Problem," *IEEE Transactions on Automatic Control*, 268-69, April 1975.
20. Delfour, M.C., and S.K. Mitter, "Hereditary Differential Systems with Constant Delays, II. A Class of Affine Systems and the Adjoint Problem," *Journal of Differential Equations*, 18(1):18-28, May 1975.
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33. Kulkarni, S.R. and S.K. Mitter, "Some discrete approximations to a variational method for image segmentation," Talk delivered at U Minnesota, April 1991, LIDS Pub # 2014.
34. Eide, E., Rohlickek, J.R., Gish, H. and Mitter, S.K., "A Linguistic Feature Representation of the Speech Waveform," IEEE, Proc. ICASSP-92.
35. Casadei, S., S.K. Mitter and P. Perona, "Boundary Detection in Piecewise Homogeneous Textured Images," ECCV, May 19-22, 1992.

36. Branicky, M., Borkar, V.S., and Mitter, S.K., "Unified Framework for Hybrid Control", Decision & Control, 33 Conference, Vol. 4, pp. 4228-4234, 1994.
37. Casadei, S. and Mitter, S.K., "A Hierarchical Approach to High Resolution Edge Contour Reconstruction," IEEE Conference of Computer Vision and Pattern Recognition, June 1996.
38. Casadei, S. and Mitter, S.K., "Hierarchical Curve Reconstruction. Part I: Bifurcation Analysis and Recovery of Smooth Curves", Proceedings of ECCV 1996, Lecture Notes in Computer Science 1064, pp. 199-208, 1996.
39. Richardson, T.J. and Mitter, S.K., "A Variational Formulation Based Edge Focussing Algorithm", Sadhana (Academy Proceedings in Engineering Sciences), Vol. 22, Part 4, August 1997.
40. Mitter, S.K., "Inference, Learning, and Recognition," Proceeding of Symposia in Pure Mathematics", Volume 60, 1997.
41. Borkar, V.S., Mitter, S.K., and Tatikonda, S., "Optimal Sequential Vector Quantization of Markov Sources", Proceedings of the 1998 IEEE Int'l Symposium on Information Theory.
42. Tatikonda, S., Sahai, A., and Mitter, S.K., "Control of LQG Systems Under Communication Constraints," in Proceedings of the American Control Conference, San Diego, CA, June 1999.
43. Mitter, S.K., "Control with Limited Information: the Role of Systems Theory and Information Theory," ISIT 2000 Plenary Talk, IEEE Information Theory Society Newsletter, 50, pgs.1-23.
44. Duci, A., A. Yezzi, S.K. Mitter and S. Soatto, "Region Matching with Missing Parts," in Proceedings of ECCV 2002, 7th European Conference on Computer Vision, Copenhagen, Denmark, May 28-31, 2002, Lecture Notes in Computer Science **2352**, pp. 48-64. (LIDS-P-2538)
45. V.S. Borkar, S.K. Mitter, A. Sahai and S. Tatikonda, "Sequential Source Coding: An optimization viewpoint," IEEE Conference Proceedings, CDC-ECC 2005, Seville, Spain.
46. M. Agarwal, A. Sahai, and S. K. Mitter, "Coding into a source: a direct inverse rate-distortion theorem," 44th Allerton Conference Proceedings 2006, full journal version is in preparation, 2008.
47. Agarwal, M., Kopparty, S., Mitter, S.K., "The Universal Capacity of Channels with Given Rate-Distortion in the absence of Common Randomness," in proceedings, 47th Allerton conference on Communication, Control, and Computing, 2009.
48. Varshney, L., Mitter, S.K. and Goyal, V. "Channels that Die," in proceedings, 47th Allerton conference on Communication, Control, and Computing, 2009.
49. Agarwal, M., Sahai, A., and Mitter, S.K., "Architecture for communication with a fidelity criterion in unknown networks," to be published in Proceedings of IFAC 2011, in preparation, August 2012.
50. Narayanan, H. and Mitter, S.K., "Sample complexity of testing the manifold hypothesis," presented at NIPS 2010, December 2010.

Invited Lectures

1. Control Theory, Center for Control Science, University of Minnesota, April 1966.
2. "Systems and Control Theory," Centre for Computing and Automation, Imperial College, London, January 1967.
3. "Decomposition of Optimal Control Problems," Summer School on Mathematical Systems Theory and Economics, Italy, June 1967.
4. "A Theory of Modal Control," School of Engineering and Applied Science, Yale University, September 1967.
5. "Reachability of Perturbed Systems and Min-Sup Problems," Washington University, St. Louis, Missouri, 1968.
6. "Aspects of Control Theory," Electrical Engineering Department, Indian Institute of Science, Bangalore, India.
7. "Controllability of Linear Systems," Mathematics Department, Cleveland State University, Cleveland, Ohio, February 1969.
8. "State Estimation of Distributed Parameter Systems," Electrical Engineering Department, Purdue University, Lafayette, Indiana, April 1969.
9. "Optimal Control of Distributed Parameter Systems," Current Trends in Control Theory, Washington University, St. Louis, Missouri, August 1969.
10. "Aspects of Numerical Solution of Optimal Control Problems," Conference on Computerized Electronics, Cornell University, Ithaca, NY, August 1969. Abstract published in proceedings of conference.
11. "A Result in Linear System Theory," 7th Annual Allerton Conference, October 1969.
12. "Control and Information Problems of Large Scale Systems," Four lectures at Institute de Recherche d'Informatique et d'Automatique, France, January 1970.
13. "Controllability and Pole Assignment for Discrete Time Systems Defined Over Arbitrary Fields," Washington University, St. Louis, Missouri, January 1970."
14. "Algebraic Aspects of Linear Systems," Ecole Centrale, Paris, February 1970.
15. "Decentralization and Decomposition of Large-Scale Systems," Mathematics Department, Universite de Paris, February 1970.
16. "Multi-level Control Systems," Laboratoire pour l'Automatique, Universite de Grenoble, France, February 1970.
17. "Optimal Control of Distributed Parameter Systems," two lectures, Centre for Computing and Automation, Imperial College, London, February 1970.
18. "Discrete Approximations for Control Problems for Partial Differential Equations," invited address, Joint Automatic Control Conference, Atlanta, Georgia, June 1970.
19. "Hereditary Differential Systems," two lectures, Institute for Fluid Dynamics and Applied Mathematics, University of Maryland, July 1970.
20. "Control of Hereditary Differential Systems," Electrical Engineering Department, University of Toronto, September 1970.
21. "Control of Systems with Time Delays," Systems Research Center, Case Western Reserve University, Cleveland, Ohio, November 1970.
22. "Hereditary Differential Systems with Non-continuous Initial Data," Center for Dynamical Systems, Brown University, Providence, Rhode Island, December 1970.

23. "Hereditary Differential Systems with Non-continuous Data," Electrical Engineering Department, University of Southern California, Los Angeles, January 1971.
24. "Stability and Convergence of Discretization Schemes for Optimal Control Problems," invited paper, Hawaii Conference on Systems Science, January 1971.
25. "Current Trends in Control Theory," Washington University, St. Louis, Missouri, August 1971.
26. Lectures at Institut de Recherche d'Informatique et d'Automatique, Versailles, France (as part of joint research program sponsored by NSF), January 1972.
27. Seminar at the University of Montreal, Centre de Recherches Mathematiques, Canada, February 1972.
28. Park City Symposium on Functional Differential Equations, sponsored by University of Utah, March 1972.
29. Seminar at the Institute of Automatic Control, University of Padua, Italy, June 1972.
30. Symposium on Functional Differential Equations, Control and Stability, University of Warwick, England, June 1972.
31. Application of Estimation Theory to the Classification of Vectorcardiograms," AAS/AIAA Astrodynamics Conference, July 1973. (with Womble, M.E., Halliday, J.S., and Yanowitz, F.G.)
32. "Control of Affine Hereditary Differential Systems," Mathematics Institute, University of Koln, Germany, January 1974.
33. "The Infinite-time Quadratic Cost Problem for Linear Hereditary Differential Systems," Institute for Automatic Control, Technical University, Hannover, February 1974.
34. Lecturer at University of Groningen, Dutch National Science Foundation, Lecturer in Applied Mathematics, Technical University of Eindhoven, University of Twente, February 1974.
35. "Dynamical Systems and Stability," Institute for Theoretical Physics, Free University of Berlin, February 1974.
36. "Control Estimation Problems for Functional Differential Equations," Mathematics Institute, University of Florence, May 1974.
37. "Duality in Optimal Control," Mathematics Institute, University of Venice, May 1974.
38. Lectures at Institut de Recherche d'Informatique et d'Automatique, Versailles, France, on Systems Theory, May and June 1975.
39. "Recent Results in Infinite Dimensional Systems Theory," Faculty of Engineering, University of Florence, Italy, July 1975.
40. "Recent Results in Control of Hereditary Differential Systems," Mathematical Institute, Udine, University of Florence, Italy, July 1975.
41. "Lagrange Duality Theory for Linear Infinite Dimensional Systems," Center for Mathematical System Theory, University of Florida, Gainesville, Florida, November 1975.
42. "Realization Theory for Linear Infinite Dimensional Systems," Center for Mathematical System Theory, University of Florida, November 1975.
43. "Lagrange Duality Theory for Optimal Control Problems," Electrical Engineering Department, University of Maryland, December 1975.

44. "Duality Theory for Optimal Control Problems," Department of Applied Science, Yale University, New Haven, Connecticut, February 1977.
45. "Infinite Dimensional Systems and Quantum Communication Theory," Department of Systems Science and Mathematics, Washington University, St. Louis, Missouri, January and May 1977.
46. "The Linear Quadratic Gaussian Control Problem for Systems with Time Delay," Clarkson College of Technology, Potsdam, New York, October 1977.
47. Eight lectures on Mathematical Problems of Quantum Communication and Quantum Fields, University of Maryland, December 1977 - February 1978.
48. Lectures on Mathematical Problems of Quantum Communication and Quantum Fields, University of Maryland, December 1977 - February 1978.
49. "Quantum Detection and Estimation Theory," Workshop on Control Theory and Optimization, University of Montreal, Canada, May and June 1978.
50. "Some Abstract Linear Programs Arising in Quantum Communication Problems," III Symposium uber Operations Research, Universitat Mannheim (WH), September 1978.
51. "Recent Results in Nonlinear Filtering," 1978 Bordeaux Conference on Algebraic and Geometric Methods in Systems Theory, Bordeaux, France, September 1978.
52. "Optimal Control," Autumn course on Systems Analysis, International Centre for Theoretical Physics, Trieste, Italy, October 1978.
53. "Algebraic Approach to Linear Matrix Equations," College of Charleston, South Carolina, AMS Meeting, November 1978.
54. "Quantum Estimation Theory," International Symposium on Systems Optimization and Analysis, IRIA, France, December 1978.
55. "Modelling for Stochastic Systems and Quantum Fields," 17th IEEE Conference on Decision and Control, San Diego, California, January 1979.
56. "Topics in Nonlinear Filtering," Workshop on Infinite Dimensional Stochastic Systems, University of California, Los Angeles, California, March 1979.
57. "Estimation Theory and Quantum Physics," CBMS Regional Conference on Geometric Methods in Systems Theory, University of California, Davis, California, March 1979.
58. "Systems with Time Delay," Seminar/Workshop on Algebraic and Geometric Methods in Linear Systems Theory, Harvard University, Cambridge, Massachusetts, June 1979.
59. "Recent Results in Non-linear Filtering," Istituto di Elettrotecnica ed Elettronica, Udine, Italy, July 1979.
60. "Recent Results in Non-linear Filtering," 1979 International Conference on Information Sciences and Systems, University of Patras, Patras, Greece.
61. "Optimal Control Theory," Series of lectures at Tata Institute of Fundamental Research, Bombay, India, July and August 1979.
62. "Infinite Dimensional Mathematical Programming Arising in Communication and Control," 10th International Symposium on Mathematical Programming, Montreal, Canada, August 1979.
63. "Observed Stochastic Systems and Quantum Physics," International Seminar on Mathematical Theory of Dynamical Systems and Microphysics, CISM, Udine, Italy, September 1979.
64. "Nonlinear Filtering Theory," CNR Meeting on Mathematical Control Theory, University of Trento, Italy, October 1979.

65. "On the Analogy Between Certain Mathematical Problems of Nonlinear Filtering and Quantum Physics," Clarkson College of Technology, Potsdam, New York, November 1979.
66. "Recent Results in Nonlinear Filtering," 18th IEEE Decision and Control Conference, Ft. Lauderdale, Florida, December 1979.
67. "Some Problems in Nonlinear Filtering," First CAS Workshop on Nonlinear Circuits and Systems, Rice University, Houston, Texas, January 1980.
68. "Recent Developments in Nonlinear Filtering," Johns Hopkins University, Baltimore, Maryland, March 1980.
69. "Nonlinear Filtering and Hamilton Jacobi Theory," University of Maryland, March 1980.
70. Two lectures in Annual Systems Theory and Operations Research Meeting, Luteran, Holland, January 14-16, 1981.
71. Nonlinear Filtering and Stochastics Mechanics, Instituto Matematico Guido Castelnuovo, University of Rome, January 21, 1981.
72. Introduction to Linear Filtering, Scuola Normale, Pisa, Italy, January 30, 1981.
73. Introduction to Non-linear Filtering, Scuola Normale, Pisa, Italy, March 5, 1981.
74. Three lectures at Tata Institute of Fundamental Research, School of Mathematics, Bombay, India, February 10-18, 1981.
75. "Journées sur des Filtrage Non-Lineaire," LAAS-Toulouse, France, March 11-12, 1981.
76. "Kalman Filtering Revisited," Instituto di Automatica, Università di Roma, Italy, March 27, 1981.
77. Four lectures on Non-linear Filtering, Instituto Matematico Guido Castelnuovo, Univ. di Roma, Italy, April 28-30, 1981.
78. Symposium on Stochastic Problems in Mechanics and Non-linear Filtering (sponsored by CNR), Istituto di Meccanica Razionale, Politecnico di Torino, Italy, May 28-30, 1981.
79. "System Theory and Lax-Phillips Scattering Theory," Workshop on Linear and Non-linear Systems, Bielefeld-Rome, Italy, June 22-July 4, 1981.
80. Six lectures on Nonlinear Filtering, CIME School on Nonlinear Filtering and Stochastic Control, Cortona, Italy, July 1-10, 1981.
81. "Recent Developments in the Theory of Nonlinear Filtering," International Symposium on the Mathematical Theory of Networks and Systems, Santa Monica, California, August 5-7, 1981.
82. "Filtering Theory," Annual Meeting of the Italian Mathematical Union, Rimini, Italy, September 29, 1981.
83. Three lectures on Nonlinear Filtering and Related Topics, NATO Advanced Study Institute on Nonlinear Stochastic Problems, Algarve, Portugal, May 16-28, 1982.
84. "Recent Developments in Filtering Theory," Optimization Days, McGill University, Montreal, Canada, May 12, 1983.
85. "Stochastic Variational Problems," Berkeley-Ames Conference on Nonlinear Problems in Control and Fluid Dynamics, Berkeley, California, May 31-June 10, 1983.
86. Lectures on Pathwise Nonlinear Filtering, Scuola Normale Superiore, Pisa, Italy, June 1983.

87. "Une Contre-exemple dans la Filtrage Trajectorielle," Institut National de Recherche en Informatique et Automatique, Sofia-Antipolis, France, June 27, 1983.
88. Two lectures on Scattering and Inverse Scattering, Mathematische Centrum, Amsterdam, Holland, August 8-12, 1983.
89. Two lectures on Estimation Theory and Mathematical Physics, Third International Seminar on Mathematical Theory of Dynamical Systems and Microphysics, Udine, Italy, September 4-9, 1983.
90. "A Counterexample in Pathwise Nonlinear Filtering," Italian National Meeting on Filtering and Stochastic Control, Padova, Italy, September 12-15, 1983.
91. "The Approximation Problem for Nonlinear Filtering," SIAM National Meeting, Norfolk, Virginia, November 6-8, 1983.
92. "Reflection Positive Gaussian Processes and Scattering Theory," Meeting on Operator Theory and Systems Theory, University of Maryland, College Park, Maryland, November 17-19, 1983.
93. "Systems Theory and Mathematical Physics," IEEE International Conference on Systems, Man and Cybernetics, Bombay, India, January 3, 1984.
94. "Scattering Theory of Adamjan and Arov and its Role in Estimation Theory," AMS Summer Conference on Linear Algebra and Linear Systems Theory, Bowdoin College, Maine, July 30-August 3, 1984.
95. "Stochastic Variational Problems," International Conference on Stochastic Optimization, Kiev, USSR, September 10-15, 1984.
96. "Mathematical Physics and Stochastic Systems," 3rd Bad-Honeff Conference on Stochastic Differential Systems, Bonn, West Germany, June 1985.
97. "Markov Random Fields and Problems in Computational Vision," IIASA Workshop, Budapest, Hungary, July 1985.
98. "Markov Random Fields and Problems in Computational Vision," 15th Conference on Stochastic Processes and their Applications, Nagoya, Japan, July 1985.
99. (with S. Gelfand), "Analysis of Simulated Annealing for Optimization," IEEE Conference on Decision and Control, Florida, December 1985.
100. "Stochastic Optimization Algorithms," International Conference on Calculus of Variations and Control Theory (in honor of L. Tonelli), Scuola Normale Superiore, Pisa, Italy, March 1986.
101. Lecture at the Workshop on Stochastic Differential Systems, Institute for Mathematics and its Applications, Minneapolis, Minnesota, June 1986.
102. "Min-Max Optimization for Rational Plants with Input Delay," Conference on Modelling and Adaptive Control, Sopron, Hungary, July 1986.
103. "Statistical Modelling of Images," IIASA Workshop "From Data to Model," Laxenburg, Austria, September 1986.
104. "Some Min-Max Optimization Problems in Infinite Dimensional Control Systems," 2nd Workshop on the Control of Systems Governed by Partial Differential Equations, Val David, Quebec, Canada, October, 1986.
105. "Image Analysis by Probabilistic Methods," Columbia University, Department of Electrical Engineering, November 1986.
106. Lecture at the Workshop on Modelling, Robustness and Sensitivity Reduction in Control Systems, Groningen, the Netherlands, December 1986.

107. Lectures at the Evolution Equation Half-Year Program, Scuola Normale Superiore, Pisa, Italy, January to June, 1987.
108. "Stochastic Quantization," Fifth Army Conference on Applied Mathematics and Computing, West Point, June, 1987.
109. "Stochastic System Theory and Statistical Physics," First International Conference on Advances in Communication and Control Systems (in honor of A.V. Balakrishnan), June, 1987.
110. "On Stochastic Quantization," First International Conference on Industrial and Applied Mathematics, Paris, July, 1987.
111. (with L. Ljung and J. Moura), "Recursive Maximum Likelihood: Case Study," IFAC'87, Munich, July 1987.
112. "Control of Infinite Dimensional Systems from a Frequency Domain Viewpoint" 13th IFIP Conference on System Modelling and Optimization, Tokyo, Japan, August 31 - September 4, 1987.
113. "Stochastic Quantization," Calculus of Variations and Stochastic Processes, a Conference in honor of Wendell H. Fleming, April 15-16, 1988.
114. "Variational and Probabilistic Problems in Image Analysis, Part I and Part II," Summer Program on Signal Processing, Institute for Mathematics and Its Applications, Minneapolis, Minnesota, July 1988.
115. "Statistical and Quantum Physics and Stochastic System Theory," Third International Workshop on the Bellman Continuum, June 13, 1988, Sophia-Antipolis, France.
116. "Dynamic Renormalization Group Method for Stochastic Fields," Imperial College Workshop on Applied Stochastic Analysis, April 1989.
117. "Local and Global Variational Problems for Boundary Detection," LMS Durham Symposium on Image Analysis, University of Strathclyde, Glasgow, July 1989.
118. "Some mathematical problems in machine vision," invited plenary talk, Venice-1/Symposium on Applied and Industrial Mathematics, October 1989; to be published as Venice 1989: The State of the Art in Applied and Industrial Mathematics, Dordrecht, the Netherlands: Kluwer, 1990.
119. "A Theory of Boundary Detection," Computer and Vision Research Center, University of Texas, Austin, November 1989.
120. "Hybrid Control in the Nematode," IEEE Conference on Decision and Control, December 1990.
121. Zeitouni, Ofer and S.K. Mitter, "An SPDE Formulation for Image Segmentation," Conference on Stochastic PDE's," Trento, Italy, January 1990.
122. Kulkarni, S.R. and S.K. Mitter, "Learning and Adaptation in Machine Vision," American Control Conference, San Diego, May 1990.
123. "Variational Problems with Free Discontinuities and Nonlinear Diffusions: Applications in Image Analysis," Systems Research Center, University of Maryland, April 1990.
124. "Variational Problems with Free Discontinuities and Nonlinear Diffusions: Applications in Image Analysis," Boston University, April 1990.
125. "Structure and Analysis of Complex Signals," plenary address, 25th Anniversary Symposium, Center International des Sciences Mécaniques, Udine, Italy, May 1990.

126. "Variational Problems with Free Discontinuities and Nonlinear Diffusions," 8th Army Conference on Applied Mathematics and Computing, Cornell University, June 1990 .
127. "Early Vision Problems and Nonlinear Diffusions," invited keynote address, Workshop on Signal Processing, Communications and Networking, Indian Institute of Science, Bangalore, India, July 1990.
128. "Recursive Algorithms," University of Minnesota, November 1990.
129. "Recursive Stochastic Algorithms for Global Optimization in Rd," Conference on Mathematical Theory of Control, Bombay, India, December 1990.
130. "Variational Principles for Neural Weight Adjustment," Center for Intelligent Control Systems Workshop on Analog, Neural and Asynchronous Computing, April 1991.
131. "Variational Methods for Image Segmentation," Institute for Mathematics and its Applications, University of Minnesota, April 1991.
132. "Stochastic Recursive Algorithms for Global Optimization in Rd" Rutgers Workshop on Applied Stochastic Analysis, May 1991.
133. Estimation for Markov Random Fields: Lectures at NATO, ASI Institute on Acoustic Signal Processing, Madeira, Portugal, July 1992.
134. Plenary Lecture: Perception, Cognition and Situated Action, American Control Conference, San Francisco, June 2-4, 1993.
135. Plenary lecture in Statistics Section: Pattern Recognition and Learning. Indian Science Congress, Calcutta, India, January, 1994.
136. Duality of Linear Input-Output Maps. Conference in Honor of Professor James L. Massey's 60th birthday at Ascone, Switzerland, February 1994.
137. Impulse Control and Hybrid Systems. Conference in Honor of Professor George Zames' 60th birthday at McGill University, May 1994.
138. A Unified Framework for Hybrid Control. 11th International Conference on Analysis and Optimization of Systems, sponsored by INRIA, Sophia Antipolis, France, June 15-17, 1994.
139. Pattern Recognition and Learning. The Legacy of Norbert Wiener: A Centennial Symposium, M.I.T., October 8-14, 1994.
140. New problems and New directions in control. 1994 Hong Kong International Workshop on New Directions of Control and Manufacturing, Hong Kong, November 7-9, 1994.
141. Uncertainty, Feedback and Wiener's Vision of Cybernetics. Norbert Wiener Centenary Congress, Michigan State University, November 27-December 3, 1994.
142. Nonlinear Filtering Revisited. Communications, Control, Signal Processing and Computation, an International Symposium at Stanford University on the occasion of Thomas Kailath's 60th Birthday, June, 1995.
143. The Limits of Universality in Problems of Inference. International Conference on Control and Information, Hong Kong, June 5-9, 1995.
144. On Uniqueness of solution to filtering equations. The Mathematical Heritage of Norbert Wiener, Indian Statistical Institute, New Delhi, India, December 28-29, 1995.
145. The Embedding of Logic in Mathematical Programming (joint work with V. Borkar and V. Chandru). Hybrid Systems IV Conference, Ithaca, New York, October 12-14, 1996.

146. Plenary Lecture: Hybrid Systems, Logic and Mathematical Programming. The Fifth IEEE Mediterranean Conference on Control and Systems, Paphos, Cyprus, July 21-23, 1997.
147. Plenary Lecture: MTNS 98, Padova, Italy, July 1998, On the Interaction between Information and Control.
148. 1998 Allerton Conference on Communication, Control and Computing, Real Time Information Theory, September 1998.
149. IEEE Information Theory Workshop on Detection, Estimation, Classification, and Imaging, Santa Fe, New Mexico, February 1999, Real Time Information Theory.
150. Workshop on Stochastic Analysis organized by CIRM, Trento, Italy. January 2000.
151. Plenary Lecture: Control with Communication Constraints: Systems Theory meets Information Theory, International Symposium on Information Theory, Sorrento, Italy, June 2000.
152. Colloquium Speaker: Towards a Unified Theory of Communications and Control, Inst. für Automatik, ETH, Zürich, Switzerland, April 11, 2001.
153. Colloquium Speaker: Towards a Unified Theory of Communications and Control, Distinguished Lecturer Series, Electrical Engineering Dept., University of Maryland, College Park, Maryland, April 27, 2001.
154. Plenary Lecturer: Control with Limited Information, European Control Conference, Porto, Portugal, September 2001.
155. IBM Technological Summit on Autonomic Computing, May 2002.
156. Plenary Lecture: System Science: The Convergence of Communication, Computation and Control, IEEE Conference on Control Applications, Glasgow, Scotland, September 2002.
157. "On Quantum Estimation and Control," International Conference on Quantum Control: Mathematical and Numerical Challenges, Centre de recherches mathématiques, Université de Montréal, Montréal (Quebec), Canada, Oct. 6-11, 2002.
158. "Statistical Inference and Statistical Mechanics," International Conference on Networked and Intelligent Systems, Beijing and Xi'an, China, October 2004.
159. "Statistical Inference and Statistical Mechanics," International Conference on Complex Systems, Hong Kong, China, October 2004.
160. "Information, Control and Statistical Mechanics," California Institute of Technology, January 2005.
161. "The Interaction of Information and Control," Workshop on Integrated Estimation, Communications and Control, California Institute of Technology, March 2005. "The Interaction of Information and Control," Seville, Spain, June 20-25, 2005.
162. "The Interaction of Information and Control," Siena, Italy, July 11-15, 2005.
163. "Davis-Varaiya Revisited," in honor of P. Varaiya's 65th birthday, University of California, Berkeley, June 5-7, 2005.
164. "The Convergence of Communication, Control and Computation," Carnegie Mellon University, October 27, 2005.
165. Plenary Lecture: The Interaction of Information and Control, ICSSCP 2006, Marrakech, Morocco, March 2006.

166. Penner Lecture, "Information and Entropy Flow in Filtering and Control," University of California, San Diego, April 7, 2006.
167. "Information and Entropy Flow in Filtering and Path Estimation," Princeton University, May 2006.
168. "Fundamental Research Needs for Embedded Networked Systems," presented at "Beyond Scada", Carnegie Mellon, Pittsburgh, PA, November 8-9, 2006.
169. "A Variational View of Channel Coding," CCDC Seminar Series, University of California at Santa Barbara, March 2007.
170. "A Variational View of Statistical Inference and Channel Coding," Workshop on Algorithms, Inference and Statistical Physics, CNLS, Los Alamos National Laboratory, May 2007.
171. Invited Lecturer, Summer Lectures on Network Science, UC San Diego, August 2007.
172. Los Alamos Nat'l Lab Information Sciences Technology Conference, Santa Fe, NM and visited Arizona State University, May 2008.
173. Distributed Energy Systems, ENDESA, Distributed Energy Systems, Madrid, Spain, November 2008.
174. Distributed Energy Systems, ENEL Power Co., Italy, November 2008.
175. Indian Institute of Science Centennial Conference, Distributed Energy Systems, Jan. 2009.
176. Three lectures on Statistical Inference and Statistical Mechanics, Indian Institute of Technology, Bombay, Jan. 2009.
177. Plenary lecture, Georgia Institute of Technology Student Conference: Towards a Unified View of Communication and Control, April 2009.
178. Symposium in honor of the 60th birthday of Steve Marcus, University of Maryland: Recent Results in Nonlinear Estimation, April 2009.
179. Invited Speaker, Stanford University, "A Retrospective look at Kalman's contributions to Systems Theory" (Introduction to Kalman's lecture as part of the Kailath Lecture), May 2009.
180. Panelist: University of California at Santa Barbara, Control Frontiers Workshop---In honor of Petar Kokotovic, May 2009.
181. Plenary lecture, COMCON Conference, Seoul, South Korea: Towards a Unified View of Communication and Control, June 2009.
182. Invited Speaker: University of Tampere, Finland, "Towards a Unified View of Communication and Control," August 2009.
183. Invited Speaker: Conference in honor of J.C. Willem's 70th birthday, Bruges, Belgium, "Recent Results in Nonlinear Estimation," September 2009.
184. Plenary Speaker, MIT-LIDS Paths Ahead in the Science of Information and Decision Systems: "Systems Theory: A Retrospective and Prospective View," November 2009.
185. Speaker, William Mong Distinguished Lectures, University of Hong Kong, Jan. 2010.
186. Invited Speaker: "Towards a Unified View of Communication and Control," International Conference on Signal Processing and Communications (SPCOM 2011), Indian Institute of Science, Bangalore, India, July 2010.
187. Invited Speaker: "Towards a Unified View of Communication and Control," ECCS NSF Grantees Conference, Honolulu, Hawaii, December 2010.

188. Invited Speaker: two lectures on "The Interaction between Communication and Control," North American School of Information Theory, University of Texas at Austin, May 27, 2011.
189. Invited Speaker: "Towards a Unified View of Communication and Control," Workshop on Perspectives and Future Directions in Systems and Control Theory, Rutgers University, NJ, May 24, 2011.
190. Invited Speaker: "A Variational Approach to Nonlinear Estimation," Tata Institute of Fundamental Research, Bangalore, India, February 2011.
191. Invited Speaker: "Systems Theory: A Retrospective and Prospective Look," Indian Institute of Science, Bangalore, India, February 2011.
192. Invited Speaker: "Towards a Unified View of Communication and Control," Workshop on Perspectives and Future Directions in Systems and Control Theory, Rutgers University, NJ, May 24, 2011.
193. Invited Speaker: two lectures on "The Interaction between Communication and Control," North American School of Information Theory, University of Texas at Austin, May 27, 2011.
194. Visiting Professor, Imperial College, London, October 2011. Lecture: "Stochastic Dissipative Systems."
195. Plenary Speaker, International Conference on Network Science, Indian Institute of Science, Bangalore, India, January 2012. Title: "Towards a Theory of Layered Architectures for Communication and Control."
196. Visiting Lecturer, Mathematics Center, Tata Institute of Fundamental Research, Bangalore, India, January--February 2012. Talks: "Statistical Inference and Statistical Mechanics for Diffusion Processes," and "Probabilistic Models of Neuroscience."