

CURRICULUM VITAE ASUMAN OZDAGLAR

Class of 1943 Career Development Professor
Associate Professor
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PERSONAL

DATE OF BIRTH: December 16, 1974
NATIONALITY: Turkish, Permanent Resident.

EDUCATION:

INSTITUTION	DEGREE	DATE
Middle East Technical University	BS, EE	1996
MIT	SM	1998
MIT	PhD	2003

TITLE OF DOCTORAL THESIS:
Pseudonormality and a Lagrange Multiplier Theory for Constrained Optimization

PROFESSIONAL EXPERIENCE

ACADEMIC POSITIONS

2003-2007 Assistant Professor of EECS, M.I.T.
2007-present Associate Professor of EECS, M.I.T.

FIELDS OF INTEREST

Nonlinear Optimization, Convex Optimization and Convex Analysis;
Game Theory;
Network Economics: pricing and resource allocation games;
Distributed Optimization Methods;
Network Optimization and Control: optical networks, wireless and wireline networks.

AWARDS AND GRANTS

AWARDS, PRIZES AND HONORS:

Bulent Kerim Altay prize (METU-TURKEY)	1993-1996
NATO Science Fellow	1996
Microsoft Fellow	2001
Graduate Student Council Teaching Award- MIT School of Engineering	2004
Provost Award	2005
Sundaram Seshu Scholar at the Coordinated Science Lab., UIUC, Inaugural lecture.	2005
NSF CAREER Award	2005
Class of 1943 Career Development Chair	2006
AACC Donald P. Eckman Award	2008

GRANTS

NSF Career Grant, “Distributed Multiagent Control and Optimization: Where Game Theory Meets Network Optimization.”

AFOSR, “Control Theoretic Modeling for Uncertain Cultural Attitudes and Unknown Adversarial Intent,” joint with Jeff Shamma (UCLA), Munther Dahleh.

NSF, “Optimization and Control of Stochastic Wireless Networks,” joint with Pablo Parrilo.

DARPA, “Control of Mobile Ad-hoc Networks,” joint with Muriel Medard.

DARPA, “ITMANET, the FLOS project,” joint with Andrea Goldsmith, Muriel Medard.

NSF, “Future Optical Network Architectures,” joint with Vincent Chan, Devavrat Shah.

Provost award.

NSF, “An Analytic Framework for Political and Social Change: Conflict, Beliefs, and Dynamics,” joint with Daron Acemoglu, Munther Dahleh, and Devavrat Shah

PROFESSIONAL SERVICE

<u>Activity</u>	<u>Beginning</u>	<u>Ending</u>
<u>Program Committee:</u>		
AMEC (Agent-Mediated Electronic Commerce) VI workshop	2004	2004
WiOpt (Intl. Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks)	2005	2006
NetEcon (Economics of Networked-Systems) Workshop	2006	
INFOCOM	2006	2007
2 nd International Conference on Complementarity, Duality, and Global Optimization in Science and Engineering	2006	2007
ACM Conference on Electronic Commerce	2006	2007
2 nd International Workshop on Game Theory in Communication Networks	2008	
International Conference on Game Theory in Networks	2009	
Information Theory Workshop (ITW)	2009	
 <u>Conference Organizer:</u>		
Conference on Frontiers in Game Theory and Networked-Systems, MIT	October 2008	
3 rd International Conference on Complementarity, Duality and Global Optimization (CDGO), MIT	May 2009	
1 st IFAC Workshop on Estimation and Control of Networked Systems (NecSys'09)	September 2009	
 <u>Other:</u>		
Associate Editor, (Optimization Theory, Algorithms and Applications for the Asia-Pacific Journal of Operational Research (APJOR))	2008	
INFORMS Session Organizer/Chair	2005, 2007	
CDC Session Organizer/Chair	2005, 2006, 2007, 2008	
INFORMS Game Theory Cluster Chair	2009	
ISMP Game Theory Cluster Chair	2009	
NSF Panel Member	2005, 2006, 2007, 2008, 2009	
Reviewer for IEEE Transactions (on Information Theory, Journal on Selected Areas in Communication, Networking, and Signal Processing), Operations Research, Mathematics of Operations Research, Optimization Methods and Software, Computational Optimization and Applications, Management Science		

PATENTS AND PATENT APPLICATIONS PENDING

A. Ozdaglar and D. P. Bertsekas, "Routing and Wavelength Assignment in Optical Networks," US Serial No. 60/295,941, June 2001.

A. Eryilmaz, M. Medard, and A. Ozdaglar, "A Method for Coding-based, Delay Efficient Data Transmission", April 2006.

PUBLICATIONS

Book and Book Chapters:

1. Bertsekas, D.P., A. Nedic, and A. Ozdaglar, *Convex Analysis and Optimization*, Athena Scientific, 2003.
2. Ozdaglar, A. and R. Srikant, "Pricing and Incentives in Communication Networks", chapter in *Algorithmic Game Theory*, Noam Nisan, Tim Roughgarden, Eva Tardos, and Vijay Vazirani, editors, Cambridge University Press, 2007.
3. Nedic, A. and A. Ozdaglar, "Cooperative Multi-agent Optimization," chapter in *Convex Optimization in Signal Processing and Communications*, Yonina Eldar and Daniel Palomar, editors, Cambridge University Press, 2009.

Papers in Refereed Journals

1. Bertsekas, D.P. and A. Ozdaglar, "Pseudonormality and a Lagrange Multiplier Theory for Constrained Optimization," *Journal of Optimization Theory and Applications*, vol. 114, pp. 287-343, 2002.
2. Ozdaglar, A. and D.P. Bertsekas, "Routing and Wavelength Assignment in Optical Networks," *IEEE Transactions on Networking*, vol. 11, no. 2, pp. 259-272, 2003.
3. Ozdaglar, A. and D.P. Bertsekas, "Optimal Solution of Integer Multicommodity Flow Problems with Application in Optical Networks," *Frontiers in global optimization, Nonconvex Optim. Appl.*, 74, Kluwer Acad. Publ., pp. 411-435, 2004.
4. Ozdaglar, A. and D.P. Bertsekas, "The Relation between Pseudonormality and Quasiregularity in Constrained Optimization," *Optimization Methods and Software, special issue in honor of Ovi Mangasarian*, vol. 19, pp. 493-506, 2004.
5. Ozdaglar, A. and P. Tseng, "Existence of Global Minima for Constrained Optimization," *Journal of Optimization Theory and Applications*, vol. 128, no. 3, 27 pages, 2006.
6. Bertsekas, D.P., A. Ozdaglar, and P. Tseng, "Enhanced Fritz John Conditions for Convex Programming," *SIAM Journal on Optimization*, vol. 16, pp. 766-797, 2006.
7. Huang, X., A. Ozdaglar and D. Acemoglu, "Efficiency and Braess' Paradox under Pricing in General Networks," *IEEE Journal on Selected Areas in Communication, special issue on Price-Based Access Control and Economics*, vol. 24, no. 5, pp. 977-991, May 2006.
8. Acemoglu, D. and A. Ozdaglar, "Competition and Efficiency in Congested Markets," *Mathematics of Operations Research*, vol. 32, no. 1, pp. 1-31, February 2007.

9. Nedic, A. and A. Ozdaglar, "A Geometric Framework for Nonconvex Optimization Duality using Augmented Lagrangian Functions," *Journal of Global Optimization*, vol. 40, no. 4, pp. 545--573, 2008.
10. Simsek, A., A. Ozdaglar and D. Acemoglu, "Generalized Poincare-Hopf Theorem for Compact Nonsmooth Regions," *Mathematics of Operations Research*, vol. 32, no. 1, pp. 193-214, February 2007.
11. Nedic, A., A. Ozdaglar, and A. Rubinov, "Abstract Convexity for Nonconvex Optimization Duality," *Optimization*, vol. 56, pp. 1-20, 2007.
12. Ozdaglar, A., "Price Competition with Elastic Traffic," to appear in *Networks, special issue on Games, Interdiction, and Human Interaction Problems in Networks*, 19 pages, 2006.
13. Acemoglu, D., R. Johari, and A. Ozdaglar, "Partially Optimal Routing," *IEEE Journal on Selected Areas in Communications, special issue on Non-cooperative Behavior in Networking*, vol. 25, no. 6, 1148-1160, August 2007.
14. Acemoglu, D. and A. Ozdaglar, "Competition in Parallel-Serial Networks," extended version of the INFOCOM 2006 paper, selected for fast-track to *IEEE Journal on Selected Areas in Communications, special issue on Non-cooperative Behavior in Networking*, vol. 25, no. 6, 1180-1192, August 2007.
15. Tang, A.K., A. Simsek, A. Ozdaglar, and D. Acemoglu, "On the Stability of P-matrices," *Linear Algebra and its Applications*, vol. 426, pp. 22-32, 2007.
16. Nedic, A. and A. Ozdaglar, "Separation of Nonconvex Sets with General Augmenting Functions," *Mathematics of Operations Research*, vol. 33, no. 3, pp. 587-605, August 2008.
17. Simsek, A., A. Ozdaglar and D. Acemoglu, "Local Indices for Degenerate Variational Inequalities," to appear in *Mathematics of Operations Research*, 21 pages, 2007.
18. Nedic, A. and A. Ozdaglar, "Distributed Subgradient Methods for Multi-agent Optimization," to appear in *IEEE Transactions on Automatic Control*, 29 pages, 2008.
19. Stein, N., A. Ozdaglar, and P.A. Parrilo, "Separable and Low-Rank Continuous Games," to appear in *International Journal of Game Theory*, 28 pages, 2008.
20. Shakkottai, S., R. Srikant, A. Ozdaglar, and D. Acemoglu, "The Price of Simplicity," to appear in *IEEE Journal on Selected Areas in Communications, special issue on Game Theory*, 20 pages, 2008.
21. Nedic, A. and A. Ozdaglar, "Convergence Rate for Consensus with Delays," *LIDS report 2774*, to appear in *Journal of Global Optimization*, 23 pages, 2007.
22. Acemoglu, D., K. Bimpikis, and A. Ozdaglar, "Price and Capacity Competition," to appear in *Games and Economic Behavior*, 40 pages, 2008.
23. Eryilmaz, A., A. Ozdaglar, and M. Medard, "[On the Delay and Throughput Gains of Coding in Unreliable Networks.](#)" *LIDS report 2765*, to appear in *IEEE Transactions on Information Theory*, 13 pages, 2008.
24. Nedic, A. and A. Ozdaglar, "Subgradient Methods for Saddle Point Problems," *LIDS report 2764*, to appear in *Journal of Optimization Theory and Applications*, 24 pages, 2008.

25. Nedic, A. and A. Ozdaglar, "Approximate Primal Solutions and Rate Analysis for Dual Subgradient Methods," *LIDS report 2753*, to appear in *SIAM Journal on Optimization*, 28 pages, 2007.
26. Nedic, A., A. Olshevsky, A. Ozdaglar, and J.N. Tsitsiklis, "On Distributed Averaging Algorithms and Quantization Effects," *LIDS report 2778*, to appear in *IEEE Transactions on Automatic Control*, 25 pages, 2008.

Proceedings of Refereed Conferences

1. Ozdaglar, A., J.H. Shapiro, and W.M. Wells, "Model-based object recognition using laser radar range imagery," *Proc. of SPIE*, vol. 3718, pp. 256-266, 1999.
2. Ozdaglar, A., J.H. Shapiro, and M.I. Miller, "Performance analysis for ground-based target orientation estimation: FLIR/RADAR sensor fusion," *Proc. of 33rd Asilomar Conference on Signals, Systems, and Computers*, pp. 1240-1244, Oct. 1999.
3. Bertsekas, D.P. and A. Ozdaglar, "Enhanced Optimality Conditions and Exact Penalty Functions," *Proc. of Allerton Conference on Communication, Control, and Computing*, 14 pages, 2000.
4. Acemoglu, D., A. Ozdaglar and R. Srikant, "The Marginal User Principle for Resource Allocation in Wireless Networks," *Proc. of CDC*, vol. 2, pp. 1544-1549, 2004.
5. Ozdaglar, A. and D. Acemoglu, "Price of Anarchy with Competing Providers for a General Demand Model," invited paper, *Proc. of Allerton Conference on Communication, Control, and Computing*, 10 pages, 2005.
6. Simsek, A., A. Ozdaglar, and D. Acemoglu, "Uniqueness of Generalized Equilibrium for Box-Constrained Problems and Applications," *Proc. of Allerton Conference on Communication, Control, and Computing*, 10 pages, 2005.
7. Acemoglu, D. and A. Ozdaglar, "Price Competition for General Topologies," *Proc. of INFOCOM*, 12 pages, 2006.
8. Eryilmaz, A., A. Ozdaglar, and M. Medard, "On Delay Performance Gains from Network Coding," invited paper, *Proc. of Conference on Information Sciences and Systems (CISS)*, 6 pages, 2006.
9. Acemoglu, D., R. Johari, and A. Ozdaglar, "Paradoxes of Traffic Engineering with Partially Optimal Routing," invited paper, *Proc. of Conference on Information Sciences and Systems (CISS)*, 7 pages, 2006.
10. Huang, X. and A. Ozdaglar, "Power Control and Network Design in Mobile Sensor Networks," *Proc. of WIOPT, 4th Intl. Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks*, 9 pages, 2006.
11. Ebad, A., A. Eryilmaz, A. Ozdaglar, and M. Medard, "Economic Aspects of Network Coding," invited paper, *Proc. of Allerton Conference on Communication, Control, and Computing*, 10 pages, 2006.
12. Acemoglu, D., K. Bimpikis, and A. Ozdaglar, "Price and Capacity Competition – Partial Results," invited paper, *Proc. of Allerton Conference on Communication, Control, and Computing*, 10 pages, 2006.

13. Stein, N., A. Ozdaglar, and P.A. Parrilo, "Separable and Low-Rank Games," *Proc. of CDC*, 7 pages, 2006.
14. Eryilmaz, A., E. Modiano, and A. Ozdaglar, "Distributed Control for Throughput-Optimality and Fairness in Wireless Networks," *Proc. of CDC*, 6 pages, 2006.
15. Eryilmaz, A., A. Ozdaglar, and E. Modiano, "Polynomial Complexity Algorithms for Full Utilization of Multi-hop Wireless Networks," *Proc. of INFOCOM 2007*, 9 pages.
16. Ozdaglar, A., "Constrained Consensus and Alternating Projections," invited paper, *Proc. of Allerton Conference on Communication, Control, and Computing*, 2007.
17. Zhao, F., M. Medard, D. Lun, and A. Ozdaglar, "Convergence Rates of Min-cost Subgraph Algorithms for Multicast in Coded Networks," invited paper, *Proc. of Allerton Conference on Communication, Control, and Computing*, 2007.
18. Ahmed, E., A. Eryilmaz, M. Medard, and A. Ozdaglar, "On the Scaling Laws of Network Coding Gains in Wireless Networks," *Proc. of MILCOM*, 2007.
19. Eryilmaz, A., A. Ozdaglar, and P. Marbach, "A Randomized Scheduler for Interference-Limited Networks," invited paper, *Proc. of Asilomar*, 2007.
20. Parandehgheibi, A., A. Ozdaglar, M. Medard, and A. Eryilmaz, "Utility Maximization for Wireless Networks," invited paper, *Proc. of Asilomar*, 2007.
21. Bimpikis, K. and A. Ozdaglar, "Price Competition with Atomic Users," invited paper, *Proc. of Asilomar*, 2007.
22. Shakkottai, S., R. Srikant, A. Ozdaglar, and D. Acemoglu, "The Price of Simplicity," invited paper, *Proc. of Asilomar*, 2007.
23. Lobel, I., D. Acemoglu, M. Dahleh, and A. Ozdaglar, "Social Learning with Partial Observations," invited paper, *Proc. of CDC*, 2007.
24. Lobel, I., D. Acemoglu, M. Dahleh, and A. Ozdaglar, "Social Learning in Networks," *Workshop on interdisciplinary systems approach in performance evaluation and design of computer and communication systems*, 2007.
25. Marbach, P., A. Eryilmaz, and A. Ozdaglar, "Capacity-Achieving Random Access Schedulers for Dense Networks," invited paper, *Proc. of CDC*, 2007.
26. Nedic, A. and A. Ozdaglar, "On the Rate of Convergence of Distributed Asynchronous Subgradient Methods for Multi-agent Optimization," *Proc. of CDC*, 2007.
27. Stein, N., P.A. Parrilo, and A. Ozdaglar, "Characterization and Computation of Correlated Equilibria in Infinite Games," invited paper, *Proc. of CDC*, 2007.
28. Parandehgheibi, A., A. Eryilmaz, A. Ozdaglar, and M. Medard, "Dynamic Rate Allocation in Fading Multiple Access Channels," invited paper, *Proc. of ITA*, 2008.

29. Parandehgheibi, A., A. Eryilmaz, A. Ozdaglar, and M. Medard, "Rate Allocation in Fading Multiple Access Channel," *Proc. of WiOpt*, 2008.
30. Nedic, A. and A. Ozdaglar, "Subgradient Methods in Network Resource Allocation: Rate Analysis," invited paper, *Proc. of CISS*, 2008.
31. Eryilmaz, A., A. Ozdaglar, D. Shah, and E. Modiano, "Imperfect Randomized Algorithms for the Optimal Control of Wireless Networks," invited paper, *Proc. of CISS*, 6 pages, 2008.
32. Bliman, P.A., A. Nedic, and A. Ozdaglar, "Rate of Convergence for Consensus with Delays," *Proc. of CDC*, 6 pages, 2008.
33. Nedic, A., A. Olshevsky, A. Ozdaglar, and J.N. Tsitsiklis, "[Distributed Subgradient Methods and Quantization Effects](#)," *Proc. of CDC*, 7 pages, 2008. **
34. Stein, N., A. Ozdaglar, and P.A. Parrilo, "Convergent Adaptive Discretization Methods for Computing Correlated Equilibria of Polynomial Games," *Proc. of CDC*, 5 pages, 2008.
35. Bethke, B., J.P. How, and A. Ozdaglar, "Approximate Dynamic Programming using Support Vector Regression," *Proc. of CDC*, 8 pages, 2008.
36. Acemoglu, D., A. Nedic, and A. Ozdaglar, "Convergence of Rule-of-Thumb Learning Rules in Social Networks," *Proc. of CDC*, 7 pages, 2008.
37. Nedic, A., A. Olshevsky, A. Ozdaglar, and J.N. Tsitsiklis, "[On Distributed Averaging Algorithms and Quantization Effects](#)," *Proc. of CDC*, 7 pages, 2008.
38. ParandehGheibi A., M. Medard, A. Ozdaglar, and A. Eryilmaz, "Information Theory vs. Queueing Theory for Resource Allocation in Multiple Access Channels", *Proc. of Personal, Indoor and Mobile Radio Communications (PIMRC)*, 2008.
39. Acemoglu, D. and A. Ozdaglar, "Spread of (Mis)Information in Social Networks," *Proc. of World Congress of the Game Theory Society*, 2008.
40. Lobel, I. and A. Ozdaglar, "Convergence Analysis of Distributed Subgradient Methods in Random Networks," invited paper, *Proc. of Allerton Conference on Communication, Control, and Computing*, 2008.
41. Lobel, I., D. Acemoglu, M. Dahleh, and A. Ozdaglar, "Rate of Convergence of Learning in Social Networks," *Proc. of ACC*, 6 pages, 2009.

Other Major Publications

1. Bertsekas, D. P., A. Nedic, and A. Ozdaglar, "Min Common/Max Crossing Duality: A Simple Geometric Framework for Convex Optimization and Minimax Theory," *Technical report, LIDS-P-2536*, 47 pages, 2002.
2. Nedic, A., A. Ozdaglar, and P.A. Parrilo, "Constrained Consensus," *LIDS report 2779*, preprint, 2008.

3. Acemoglu, D., M. Dahleh, I. Lobel, and A. Ozdaglar, "Bayesian Learning in Social Networks," *LIDS report 2780*, preprint, 2008.
4. Eryilmaz, A., A. Ozdaglar, D. Shah, and E. Modiano, "Distributed Randomized Algorithms for the Optimal Control of Wireless Networks," submitted for publication, 2008.
5. Parandehgheibi, A., A. Eryilmaz, A. Ozdaglar, and M. Medard, "On Resource Allocation in Fading Multiple Access Channels – An Efficient Approximate Projection Approach," *LIDS report 2787*, submitted for publication in *IEEE Transactions on Information Theory*, 32 pages, 2008.
6. Lobel, I. and A. Ozdaglar, "Distributed Subgradient Methods over Random Networks," submitted for publication in *IEEE Transactions on Automatic Control*, 28 pages, 2008.
7. Acemoglu, D., K. Bimpikis, and A. Ozdaglar, "Experimentation, Patents, and Innovation," submitted for publication in *Journal of Political Economy*, 46 pages, 2008.
8. Y. Lu, A. Ozdaglar, and D. Simchi-Levi, "A Dynamic Programming Approach to Buying a Large Block of Security with Adaptive Safe Price," submitted for publication in *Operations Research*, 13 pages.
9. B. Bethke, J.P. How, and A. Ozdaglar, "Kernel-based Reinforcement Learning using Bellman Residual Elimination," submitted for publication in *Journal of Machine Learning Research*, 48 pages.
10. P. Njoroge and A. Ozdaglar, "Competition in Interconnected Internet Platforms," submitted for publication in *Review of Network Economics*, 32 pages.

INVITED LECTURES

November 2003, "Flow Control and Routing from Service Provider Viewpoint," Operations Research Center, Massachusetts Institute of Technology.

November 2003, "A Lagrange Multiplier Theory for Constrained Optimization," Electrical Engineering Department, California Institute of Technology.

March 2004, "Towards a Game-Theoretic Analysis of Communication Networks," Decision Sciences Group, Fuqua School of Business, Duke University.

October 2004, "Towards a Game-Theoretic Analysis of Communication Networks," Industrial and Systems Engineering Department, Lehigh University.

October 2004, "Price of Anarchy in Price Competition Games," INFORMS, invited talk.

October 2004, "Efficiency and Braess' Paradox under Pricing in General Networks," IEEE Annual Computer Communications Workshop, invited talk.

March 2005, "Competition and Efficiency in Congested Markets," Electrical Engineering Department, California Institute of Technology.

May 2005, "Competition and Efficiency in Congested Markets," University of Waterloo, Mathematical Modeling and Analysis of Communication Networks Workshop, invited talk.

August 2005, "Differential Topology for the Uniqueness of Critical Points," International

Conference on Complementarity, Duality, and Global Optimization in Science and Engineering, invited talk.

August 2005, "Competition and Efficiency in Congested Markets," Coordinated Science Lab., UIUC.

September 2005, "Price of Anarchy with Competing Providers for a General Demand Model," Allerton Conference on Communication, Control, and Computing, invited talk.

November 2005, "Competition and Efficiency in Congested Markets," Electrical Engineering Department, Boston University, invited seminar.

November 2005, "Applications of Generalized Poincare Hopf in Network Optimization," INFORMS, invited talk.

March 2006, "Paradoxes of Traffic Engineering with Partially Optimal Routing," Conference on Information Sciences and Systems (CISS), invited talk.

April 2006, "Economic Incentives and Traffic Engineering in Networked-Systems," MIT Information Technology Conference on "Next Generation Computing and Wireless Networks", invited talk.

September 2006, "Paradoxes of Traffic Engineering with Partially Optimal Routing," Industrial and Enterprise Systems Engineering, UIUC.

September 2006, Allerton Conference on Communication, Control, and Computing, invited talks.

October 2006, "Competition and Efficiency in Congested Markets," Radcliffe Exploratory Seminar on Dynamic Networks: Behavior, Optimization and Design, Radcliffe Institute, Harvard University, invited talk.

December 2006, "A Geometric Framework for Nonconvex Optimization Duality and Penalty Methods," 5th Ballarat Workshop on Global and Non-Smooth Optimization: Theory, Methods and Applications, Australia, invited talk.

January 2007, "Price and Capacity Competition," Conference on the Economics of the Software and Internet Industries, Toulouse, invited talk.

February 2007, "Competition and Efficiency in Congested Markets," Isenberg School of Management, University of Massachusetts, Amherst, invited seminar.

February 2007, "A Geometric Framework for Nonconvex Optimization Duality and Penalty Methods," 2nd International Conference on Complementarity, Duality, and Global Optimization, invited talks.

March 2007, "Approximate Primal Solutions and Rate Analysis for Dual Subgradient Methods," 2nd Cowles Foundation Workshop in Optimization, Yale University, invited talk.

March 2007, "Approximate Primal Solutions and Rate Analysis for Dual Subgradient Methods," Harvard University, invited seminar.

June 2007, "Primal Solutions and Rate Analysis for Subgradient Methods," University of Torino, invited seminar.

July 2007, "Consensus Problems for Multi-agent Systems," Euroopt XXII, Prague, invited talk.

July 2007, "Primal-Dual Subgradient Methods and Rate Analysis," 22nd European Conference on

Operational Research: Nonsmooth Optimization, Theory, Algorithms, and Applications, Prague, invited talk.

August 2007, "Index Theory for Global Uniqueness of Critical Points," 2nd International Conference on Continuous Optimization, invited talks.

September 2007, "Primal Solutions and Rate Analysis for Subgradient Methods," Electrical and Systems Engineering Department, University of Pennsylvania, invited seminar.

September 2007, Allerton Conference on Communication, Control, and Computing, invited talks.

November 2007, INFORMS, invited talks.

November 2007, ASILOMAR, invited talks.

December 2007, CDC, invited talks.

December 2007, "Networks' Challenge: Where Game Theory Meets Network Optimization," CAMSAP, plenary talk.

December 2007, "Distributed Subgradient Methods for Multi-Agent Optimization," Workshop on Optimization and Signal Processing, Hong Kong, invited talk.

December 2007, "Distributed Subgradient Methods for Multi-Agent Optimization," and "Dual Computational Methods," National Science and Research Council, Turkey, invited talks.

January 2008, "Networks' Challenge: Where Game Theory Meets Network Optimization," Electrical and Systems Engineering Department, University of Pennsylvania, invited seminar.

January 2008, "Dynamic Rate Allocation in Fading Multiple Access Channels," ITA workshop, invited talk.

March 2008, "Subgradient Methods for Saddle Point Problems," INFORMS Optimization Society 2008 Conference, invited talk.

March 2008, "Subgradient Methods in Network Resource Allocation: Rate Analysis," Conference on Information Sciences and Systems (CISS), invited talk.

April 2008, Second International Conference on Nonlinear Programming with Applications, Beijing, China, invited talk.

April 2008, "Approximate Primal Solutions and Rate Analysis in Subgradient Methods," University of Washington, invited seminar.

April 2008, "Consensus and Distributed Optimization in Multi-Agent Systems," Columbia University, invited seminar.

May 2008, SIAM conference on optimization, invited talks.

May 2008, Caltech Workshop on Dynamics in Microeconomics and Game Theory, invited talk.

July 2008, International Symposium on Information Theory, invited tutorial on Game Theory.

July 2008, Mathematical Theory of Networks and Systems (MTNS), invited talk.

September 2008, Allerton Conference on Communication, Control, and Computing, invited talks.

October 2008, INFORMS, invited talks.

November 2008, Stanford University, invited seminar.

December 2008, IEEE Conference on Decision and Control (CDC), invited tutorial on Game Theory and Networks.

January 2009, "Adaptive Systems and Mechanism Design," UC Irvine, invited talk.

January 2009, KTH, invited talk.

March 2009, Cornell, invited seminar.

March 2009, Optima, invited talk.

May 2009, GameNets, Istanbul, Turkey, invited talk.

June 2009, ACC, plenary talk.

August 2009, ISMP, invited talks.

September 2009, 1st IFAC Workshop on Estimation and Control of Networked Systems (NecSys'09), invited talk