

CONTACT INFORMATION

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RESEARCH INTERESTS

- ◇ Theory of Distributed Optimization and Computation
- ◇ Random Matrix Theory and Applications in Control Theory
- ◇ Population Games and Evolutionary Game Theory

EMPLOYMENT HISTORY

University of California San Diego, California, USA July 2021-present
Associate Professor of Electrical and Computer Engineering Department

University of California San Diego, California, USA July 2017-June 2021
Assistant Professor of Electrical and Computer Engineering Department

University of Colorado Boulder, Colorado, USA July 2014-July 2019
Assistant Professor of Electrical, Computer, and Energy Engineering Department

Georgia Tech, Georgia, USA Feb 2013-July 2014
Postdoctoral Researcher, School of Electrical and Computer Engineering

University of Illinois at Urbana-Champaign, Illinois, USA Dec 2011-Jan 2013
Postdoctoral Researcher, Coordinated Science Laboratory

EDUCATION

University of Illinois at Urbana-Champaign, Urbana, Illinois, USA Dec 2011
Ph.D. in Industrial Engineering (Operations Research), GPA: 4.0/4.0
Thesis Title: *Product of Random Stochastic Matrices and Distributed Averaging*
Adviser: Prof. Angelia Nedić

Jacobs University Bremen, Bremen, Germany June 2008
M.Sc. in Communications, Systems, and Electronics
Thesis Title: *Some New Results on Linear-Programming Decoding of Binary Linear Codes*
Adviser: Prof.-Dr. Werner Henkel

Isfahan University of Technology, Isfahan, Iran June 2006
B.Sc. in Electrical Engineering

SELECTED HONORS AND AWARDS

Donald P. Eckman Award for outstanding contributions to “stochastic methods applied to distributed and networked control systems.”
June 2018

Finalist for the best paper award of ACM SIGMOD for the paper “The Data Interaction Game.”

June 2018

USA Air Force Office of Scientific Research (AFOSR) Young Investigator Award 2016 for “Structural Approach to Distributed Optimization” Jan 2016

Outstanding Reviewer of IEEE Transactions on Automatic Control in 2014 Jan 2015

Co-author of the Best Student Paper Award September 2012

2012’IFAC (International Federation for Automatic Control) Workshop on Distributed Estimation and Control in Networked Systems, Santa Barbara

Ph.D. Thesis appeared in Springer’s Distinguished Theses series Fall 2011

“The best of the best: Internationally top-ranked research institutes select their best thesis annually for publication in this series.” from: <http://www.springer.com/series/8790>

Finalist for the best student paper award of IEEE Conference on Decision and Control, Atlanta, Georgia Dec 2010

Short-listed for the best paper award of ISIF Conference on Information Fusion 2009, Seattle, Washington July 2009

Full scholarship award for Master’s studies Sep 2006-July 2008
Jacobs University Bremen, Bremen, Germany

3rd place prize winner of 13th International Mathematics Competition for University Students July 2006
Odessa, Ukraine

Bronze medal of 28th Iran’s National Mathematical Competition for Undergraduate Students May 2004
Sharif University of Technology, Tehran, Iran

PUBLICATIONS

Book

- B. Touri, Product of Random Stochastic Matrices and Distributed Averaging, *Springer Theses series*, April 2012.

Journal Publications (published)

1. R. Parasnian, M. Franceschetti, and B. Touri, Non-Bayesian social learning on random digraphs with aperiodically varying network connectivity, *to appear at IEEE Transactions on Control of Network Systems*.
2. A. Aghajan, and B. Touri, Ergodicity of Continuous-Time Distributed Averaging Dynamics: A Spanning Tree Approach, *IEEE Transactions on Automatic Control*, Vol. 67, no. 2, pp. 918 - 925, Feb 2022.
3. R. Parasnian, M. Franceschetti, and B. Touri, On the Convergence Properties of Social Hegselmann-Krause Dynamics, *IEEE Transactions on Automatic Control*, Vol. 67, no. 2, pp. 589 - 604, Feb 2022.
4. S. Sarmashghi, M. Balaban, E. Rachtman, B. Touri, S. Mirarab, V. Bafna, Estimating repeat spectra and genome length from low-coverage genome skims with RESPECT, *PLOS Computational Biology*, 17(11): e1009449, 2021.
5. K. Garifi, K. Baker, D. Christensen, and B. Touri, Convex Relaxation of Grid-Connected

- Energy Storage System Models with Complementarity Constraints in DC OPF, *IEEE Transactions on Smart Grid*, Vol. 11, Issue 5, pp. 4070-9, April 2020.
6. B. McCamish, V. Ghadakchi, A. Termehchy, B. Touri, E. Cotilla-Sanchez, A Game-theoretic Approach to Data Interaction, *ACM Transactions on Database Systems (TODS)*, 45 (1), 1-44.
 7. B. McCamish, V. Ghadakchi, A. Termehchy, L. Huang, and B. Touri, How Do Humans and Data Systems Establish a Common Query Language?, *ACM SIGMOD Record*, 48 (1), 5158, 2019.
 8. P. Rezaeinia, B. Gharesifard, T. Linder, and B. Touri, Push-sum on random graphs: almost sure convergence and convergence rate, *IEEE Transactions on Automatic Control*, Vol. 65 , Issue 3, March 2020, 2019.
 9. B. Touri and B. Gharesifard, A Modified Saddle-point Dynamics for Distributed Convex Optimization on General Directed Graphs, *IEEE Transactions on Automatic Control*, Oct. 2019.
 10. H. Mahdavifar, A. Beirami, B. Touri, and J. Shamma, Global Games with Noisy Information Sharing, *IEEE Transactions on Signal and Information Processing over Networks*, Vol. 4, number 3, pp. 497–509, 2018.
 11. B. Touri, H. Jaleel, JS. Shamma, Stochastic Evolutionary Dynamics: A Graphical Reformulation of Evolutionarily Stable Strategy (ESS) Analysis, *IEEE Control Systems Letters*. 3 (1), 55-60, Jan. 2019.
 12. T. Tatarenko and B. Touri, Non-Convex Distributed Optimization, *IEEE Transactions on Automatic Control*, Vol. 62, number 8, pp. 3744 - 3757, Aug. 2017.
 13. S. O'Rourke and B. Touri, On a conjecture of Godsil concerning controllable random graphs, *SIAM Journal of Control and Optimization*, Vol 54, number 6, pp. 3347–3378, 2016.
 14. A. Kanakia, B. Touri and N. Correll, Modeling Multi-Robot Task Allocation with Limited Information as Global Game, *Swarm Intelligence*, Vol. 10, number 2, pp. 147–160, 2016.
 15. B. Gharesifard, B. Touri, T. Başar and J. Shamma, On the Convergence of Piecewise Linear Strategic Interaction Dynamics on Networks, *IEEE Transactions on Automatic Control*, Volume 61, 6, pp 1682–1687, June 2016.
 16. M. Fox, B. Touri, and J. Shamma, Dynamics in atomic signaling games, *Journal of Theoretical Biology*, Volume 376, Pages 82–90, July 2015.
 17. B. Touri and C. Langbort, On Endogenous Random Consensus and Averaging Dynamics, *IEEE Transactions on Control of Network Systems*, Vol 1, pp 241 - 248, July 2014.
 18. B. Touri and A. Nedić, Product of Random Stochastic Matrices, *IEEE Transactions on Automatic Control*, Vol 59, pp 437-448, Feb 2014.
 19. B. Touri and A. Nedić, On backward product of stochastic matrices, *IFAC journal of Automatica*, Vol 48, pp 1477-1488, Aug 2012.
 20. B. Touri and A. Nedić, On approximations and ergodicity classes in random chains, *IEEE Transactions on Automatic Control*, vol 57, pp. 2718 – 2730, Nov 2012.
 21. B. Touri and A. Nedić, On ergodicity, infinite flow and consensus in random models, *IEEE Transactions on Automatic Control*, Vol 56, pp. 1593 – 1605, July 2011.

Peer Reviewed Conferences

1. R. Parasnis, A. Sakhale, R. Kato, M. Franceschetti, B. Touri, A Case for the Age-Structured SIR Dynamics for Modelling COVID-19, *60th IEEE Conference on Decision and Control (CDC)*, Austin, Dec 2021.
2. H. Reisizadeh, B. Touri, S. Mohajer, Adaptive Bit Allocation for Communication-Efficient Distributed Optimization, *60th IEEE Conference on Decision and Control (CDC)*, Austin, Dec 2021.
3. A. Verma, M. M. Vasconcelos, U. Mitra, B. Touri, Max-Gossip Subgradient Method for Distributed Optimization, *60th IEEE Conference on Decision and Control (CDC)*, Austin, Dec 2021.
4. S. Sarmashghi, M. Balaban, E. Rachtman, B. Touri, S. Mirarab, and V. Bafna, Vineet, “Estimating repeat spectra and genome length from low-coverage genome skims with RESPECT,” to appear in *International Conference in Computational Molecular Biology (RECOMB)*, Aug 2021.
5. R. Parasnis, M. Franceschetti, and B. Touri, “Uniform Strong Connectivity is Not Necessary for Non-Bayesian Social Learning on Time-Varying Directed Graphs,” *IEEE Conference on Decision and Control (CDC)*, pp. 4933-4940, Dec. 2020.
6. A. Aghajan and B. Touri, “On Ergodicity of Time-Varying Distributed Averaging Dynamics,” *American Control Conference*, Denver, USA, July 2020.
7. R. Parasnis, M. Franceschetti, and B. Touri, “On Graphs with Bounded and Unbounded Convergence Times in Social Hegselmann-Krause Dynamics,” *IEEE Conference on Decision and Control*, Nice, France, Dec 2019.
8. K. Garifi, K. Baker, and B. Touri, D. Christensen, “Stochastic Home Energy Management Systems with Varying Controllable Resources,” *IEEE Power and Energy Society General Meeting*, Atlanta, USA, August 2019.
9. B. Touri, H. Jaleel, J.S. Shamma, “Stochastic Evolutionary Dynamics: A Graphical Reformulation of Evolutionarily Stable Strategy (ESS) Analysis,” *IEEE Conference on Decision and Control*, Miami, USA, Dec 2018.
10. R. Parasnis, M. Franceschetti, and B. Touri, “Hegselmann-Krause Dynamics with Limited Connectivity,” *IEEE Conference on Decision and Control*, Miami, USA, Dec 2018.
11. P. Rezaienia, B. Gharesifard, T. Linder, and B. Touri, “Convergence Rate of Push-Sum Algorithms on Random Graphs,” *IEEE Conference on Decision and Control*, Miami, USA, Dec 2018.
12. P. Rezaienia, B. Gharesifard, T. Linder, and B. Touri, “Distributed optimization on random graphs,” *7th IFAC Workshop on Distributed Estimation and Control in Networked Systems NECSYS 2018*, Groningen, The Netherlands, August, 2018.
13. K. Garifi, K. Baker, and B. Touri, D. Christensen, “Stochastic Model Predictive Control for Demand Response in a Home Energy Management System,” *IEEE Power and Energy Society General Meeting*, Portland, OR, August 2018.
14. B. McCamish, A. Termehchy, and B. Touri, “The Data Exploration Game,” In Proceedings of the IEEE International Conference on Data Engineering (ICDE), Paris, France, April 2018.
15. B. McCamish, V. Ghadakchi, A. Termehchy, B. Touri, and L. Huang, “The Data Interaction Game,” In Proceedings of the 2018 International Conference on Management of Data (SIGMOD '18). ACM.

16. F. Somenzi, B. Touri, and A. Trivedi, Global Almost-Sure Reachability in Stochastic Constant-Rate Multi-Mode Systems, *ACM International Conference on Hybrid Systems: Computation and Control (HSCC 2018)*, Porto, Portugal, April 2018.
17. B. McCamish, A. Termehchy, B. Touri, and L. Huang, Learning Strategies in Game-theoretic Data Interaction, *SIGKDD Workshop on Interactive Data Exploration and Analytics (IDEA)*, August 2017.
18. K. Garifi, L. Pao, and B. Touri, “Model Predictive Control for Track Following and Disturbance Rejection in a Tape Drive System,” *Proc. IFAC World Congress*, Toulouse, France, pp. 4570-4577, July 2017.
19. S. O’Rourke and B. Touri, LittlewoodOfford Theory and Controllability of Random Structures, *IEEE Conference on Decision and Control*, Las Vegas, USA, Dec 2016.
20. B. Touri and B. Gharesifard, Saddle-point Dynamics for Distributed Convex Optimization on General Directed Graphs, *accepted for presentation at IEEE Conference on Decision and Control*, Las Vegas, USA, Dec 2016.
21. T. Tatarenko and B. Touri, On Local Analysis of Distributed Optimization, submitted to *American Control Conference 2016*.
22. B. Touri and B. Gharesifard, Continuous-time distributed convex optimization on time-varying directed networks, *IEEE Conference on Decision and Control*, Osaka, Japan, Dec 2015.
23. D. Jones and B. Touri, On Synchronization in Networks of Coupled Oscillators, *IEEE Conference on Decision and Control*, Osaka, Japan, Dec 2015.
24. J.R. Marden, B. Touri, R Gopalakrishnan, and J.P. O’Brien, Impact of Information in a Simple Multiagent Collaborative Task, *IEEE Conference on Decision and Control*, Osaka, Japan, Dec 2015.
25. H. MahdaviFar, A. Beirami, B. Touri, and J. Shamma, Threshold Policy for Global Games with Noisy Information Sharing, *IEEE Conference on Decision and Control*, Dec 2015.
26. A. Termehchy and B. Touri, A Signaling Game Approach to Database Querying and Interaction, *SIGIR International Conference on the Theory of Information Retrieval*, Boston, Sep 2015.
27. D. Steeves, J. Coulson, B. Gharesifard, and B. Touri, On the Termination Time of the One-Sided Asymmetric Hegselmann-Krause Dynamics, *American Control Conference*, Chicago, July 2015.
28. B. Touri and J. Shamma, Global Games with Noisy Sharing of Information, *IEEE Conference on Decision and Control 2014*, Los Angeles, USA, Dec 2014.
29. B. Touri and C. Langbort, On Indigenous Random Consensus and Averaging Dynamics, *IEEE Conference on Decision and Control 2013*, Florence, Italy, Dec 2013.
30. B. Gharesifard, B. Touri, T. Başar, and C. Langbort, Distributed Optimization by Myopic Strategic Interactions and the Price of Heterogeneity, *IEEE Conference on Decision and Control 2013*, Florence, Italy, Dec 2013.
31. A. Khanafar, B. Touri, and T. Başar, Robust Distributed Averaging on Networks with Adversarial Intervention, *IEEE Conference on Decision and Control 2013*, Florence, Italy, Dec 2013.

32. F. Farnoud, E. Yaakobiy, B. Touri, O. Milenkovic, and J. Brucky, Building Consensus via Iterative Voting, *IEEE International Symposium on Information Theory (ISIT) 2013*, Istanbul, Turkey.
33. B. Touri, and C. Langbort, Language Formation in a Noisy Environment, *American Control Conference 2013*, Washington-DC, June 2013.
34. B. Touri, F. Farnoud, A. Nedić, and O. Milenkovic, A General Framework for Distributed Vote Aggregation, *American Control Conference 2013*, Washington-DC, June 2013.
35. S. Mohajer and B. Touri, On Convergence Rate of Scalar Hegselmann-Krause Dynamics, *American Control Conference 2013*, Washington-DC, June 2013.
36. S.R. Etesami, T. Başar, A. Nedić, and B. Touri, Termination Time of Multidimensional Hegselmann-Krause Opinion Dynamics, *American Control Conference 2013*, Washington-DC, June 2013.
37. A. Khanafer, B. Touri, and T. Başar, Consensus in the Presence of Adversary, *3rd IFAC Workshop on Distributed Estimation and Control in Networked Systems*, Santa Barbara, Sep 2012.
38. F. Farnoud, B. Touri, and O. Milenkovic, Distance Measures for Partial Vote Aggregation, *SPCOM 2012, Bangalore*, India, July 2012.
39. B. Touri, T. Başar, and A. Nedić, On Averaging Dynamics in General State Spaces, *51th IEEE Conference on Decision and Control, Maui, Hawaii, Dec 2012*.
40. B. Touri and A. Nedić, Multi-Dimensional Hegselmann-Krause Dynamics, *51th IEEE Conference on Decision and Control, Maui, Hawaii, Dec 2012*.
41. B. Touri and A. Nedić, On Existence of a Quadratic Comparison Function for Random Weighted Averaging Dynamics and Its Implications, *50th IEEE Conference on Decision and Control*, Orlando, Florida, Dec 2011.
42. B. Touri and A. Nedić, Discrete-time Opinion Dynamics, *45th Asilomar Conference on Signals, Systems and Computers*, Pacific Grove, Nov 2011.
43. B. Touri and A. Nedić, Alternative Characterization of Ergodicity for Doubly Stochastic Chains, *50th IEEE Conference on Decision and Control*, Orlando, Florida, Dec 2011.
44. B. Touri and A. Nedić, When infinite flow is sufficient for ergodicity, *49th IEEE Conference on Decision and Control, finalist for the best paper award*, Atlanta, Georgia, Dec 2010.
45. B. Touri and A. Nedić, Approximation and limiting behavior of random models, *49th IEEE Conference on Decision and Control 2010*, Atlanta, Georgia, Dec 2010.
46. B. Touri and A. Nedić, Distributed consensus over networks with noisy links, *FUSION 2009, short-listed for the best paper award*, Seattle, Washington, July 2009.

Invited Talks

- B. Touri, Products of Random Stochastic Matrices, *American Mathematics Society Workshop on Random Matrices, Integrable Systems, and Applications*, Denver, Oct 2016.
- B. Touri and J.S. Shamma, Evolutionary Stability and Adaptation in Population Games, *Annual Allerton Conference on Communication, Control, and Computing*, Monticello, Illinois, Oct 2016.

- B. Touri, Non-Convex Distributed Optimization, *Department of Applied Mathematics at the University of Colorado*, Boulder, Boulder, April 2016.
- B. Touri, Information sharing and coordination in global games, *Workshop on Distributed Autonomy and Human-Machine Networks*, Osaka, Japan, Dec 2015.
- B. Touri and S. O'Rourke, *Universality and Minimal Controllability of Random Systems*, *Annual Allerton Conference on Communication, Control, and Computing*, Monticello, Illinois, Oct 2015.
- B. Touri, Products of Random Stochastic Matrices and Applications, *Department of Electrical Engineering at Colorado State University*, Fort Collins, March 2015.
- B. Touri and J. Shamma, Global games with noisy sharing of information, *Information Theory and Applications Workshop*, San Diego, Feb 2015.
- B. Touri, Products of Random Stochastic Matrices and Applications, *Department of Applied Mathematics at the University of Colorado*, Boulder, September 2015.
- B. Touri and B. Ghahsifard, A distributed observer for distributed control systems, *Annual Allerton Conference on Communication, Control, and Computing*, Monticello, Illinois, Oct 2014.
- B. Touri and J. Shamma, Global games with noisy sharing of information, *Information Theory and Applications Workshop*, San Diego, Feb 2015.
- B. Touri and B. Ghahsifard, A distributed observer for distributed control systems, *Annual Allerton Conference on Communication, Control, and Computing*, Monticello, Illinois, 2014.
- B. Touri, Co-Evolutionary Dynamics, *Department of Electrical Engineering, University of California Los Angeles*, Los Angeles, Feb 2014.
- B. Touri, Evolutionary Game Theory Revisited: a Theory for Multiple Mutations, *Information Theory and Applications Workshop 2014*, San Diego, Feb 2014.
- B. Touri, Products of Random Stochastic Matrices and Applications, *Georgia Tech Center for Signal and Information Processing*, Atlanta, Georgia, Nov 2013.
- B. Touri and C. Langbort, Distributed Learning of Color Spectrum Partitioning, *Information Theory and Applications Workshop*, San Diego, Feb 2013.
- B. Touri and C. Langbort, Language Development in a Noisy Environment among Interacting Agents, *Santa Fe Institute Workshop on Combining Information Theory and Game Theory*, Santa Fe Institute, Aug 2012.
- B. Touri, Contribution of Andrey Kolmogorov to Consensus and Opinion Dynamics, *2012 Information Theory and Applications Workshop*, San Diego, Feb 2012.
- B. Touri, Product of Random Stochastic Matrices, *Department of Statistics, Yale University*, June 2011.
- B. Touri, Comparison Functions, Infinite Flow and Ergodicity, *Laboratory for Information and Decision Systems*, MIT, March 2011.

PROFESSIONAL ACTIVITIES

Organizer

2019 Information Theory and Applications Workshop, San Diego, Feb. 2019.

2018 Information Theory and Applications Workshop, San Diego, Feb. 2018.

TPC Member

2019-present: IEEE Conferences on Decision and Control (CDC)

2019-present: American Control Conferences

2016 IEEE Global Conference on Signal and Information Processing (GlobalSIP 2016).

Organizer

Co-organizer of University of Colorado's Control, Dynamics, and Systems (CDS) Seminar Series, August 2014 to May 2016.

Co-organizer of a session on faculty job market, American Control Conference, Boston, June 2015.

Organizer of NIPS 2012 Workshop on Social Choice: Theory and Practice, NIPS 2012, Lake Tahoe,

Utah, Dec 2012.

Organizer of an invited session on *Information Networks: Theory and Practice* for 50th Annual Allerton Conference on Communication, Control, and Computing, Allerton Park, Monticello, Oct 2012.

Organizer of two invited sessions on *Dynamics on Networks* for 51st IEEE Conference on Decision and Control 2012, Maui, Hawaii, Dec 2012.

Reviewer

Journals: IEEE Transactions on Automatic Control, IFAC Journal of Automatica, SIAM Journal of Control and Optimization, IEEE Transactions on Signal Processing, IEEE Transactions on Control of Network Systems, IEEE Transactions on Network Science and Engineering, IEEE Transactions on Robotics, Systems and Control Letters, IEEE Signal Processing Magazine, IEEE Transactions on Systems, Man, and Cybernetics, IEEE Communications Letters, Journal of Difference Equations and Applications, Journal of Machine Learning Research, Journal of Optimal Control Applications and Methods, Journal of Optimization Theory and Applications

Conferences: IEEE Conference on Decision and Control, IEEE American Control Conference, IEEE Systems and Control Letters, European Control Conference, IEEE International Symposium on Information Theory (ISIT), IFAC Workshop on Distributed Estimation and Control in Networked Systems, NeurIPS