RAISSA M. D'SOUZA

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Associate Dean of Research, College of Engineering &
Professor
Computer Science Department
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EDUCATION

Massachusetts Institute of Technology, Cambridge, MA.
Ph.D. in Statistical Physics — October 1999
Co-advisors: Prof. Mehran Kardar, Dr. Norm Margolus
Thesis: *Macroscopic order from reversible and stochastic lattice growth models*
Recipient of the Sergio Vazquez PhD Thesis Award

University of Illinois, Champaign-Urbana, IL.
B.S. in Physics with Distinction — May 1991

CURRENT PROFESSIONAL AFFILIATIONS

Associate Dean of Research, College of Engineering, **University of California, Davis**, CA.

Professor, **University of California, Davis**, CA.

External Professor, **Santa Fe Institute**, 2007-present.

External Professor, **Complexity Sciences Hub, Vienna**, 2019-present.

Board of Reviewing Editors, ***Science***, 2020-present.

Science Board, **Santa Fe Institute**, 2018-present.

Editorial Board, ***Internet Mathematics***, 2016-present.

Council on Competitiveness, National Commission on Innovation & Competitiveness, 2023-present.

HONORS & AWARDS

- Elected **Fellow of the American Physical Society**, Class of 2016.
- Elected **Fellow of the Network Science Society**, Class of 2019.
- 2019 **Euler Prize** (Inaugural recipient), Network Science Society.
- **Best paper of 2020 award**, *Risk Analysis*.
- **Test of Time Award** at FSE/ICSE 2018 for paper with most lasting impact from FSE/ICSE 2008.
- 2017 UC Davis College of Engineering, **Outstanding Mid-Career Faculty Research Award**.
- Winner, **ACM SIGSOFT Distinguished Paper Award**, *ICSE 2013*.
- Inaugural Member, **Global Young Academy**, InterAcademy Panel, 2010-2014.
- **National Academy of Sciences of U.S.A.**, Kavli Fellow, 2006, 2007, 2008, 2011.
- **National Academy of Sciences of U.S.A.** "Young scientist" World Economic Forum, China, 2009.
- Vazquez Ph.D. Thesis Award, **MIT Department of Physics**, 1999.
- **MIT Department of Physics** Hellman Fellowship, 1991-1994.

EMPLOYMENT HISTORY

- **Associate Dean of Research**, College of Engineering — July 2022 - present
  University of California, Davis, CA.
- **Professor**, **University of California, Davis**, CA. — July 2014 - present
  Department of Computer Science, Department of Mechanical and Aerospace Engineering, Department of Physics, Applied Math Graduate Group.
- Associate Professor, **University of California, Davis**, CA. — July 2008 - June 2014
- Assistant Professor, **University of California, Davis**, CA. — Sept. 2005 - June 2008
- **Microsoft Research**, Redmond, WA. — 2002 - 2004
  Postdoctoral member of the Theory Group.
- **Bell Laboratories**, Murray Hill, NJ — 2000 - 2002
  Postdoctoral member of the technical staff: Theoretical Physics Department and the Fundamental Mathematics Department.
- **MIT** Department of Physics, and Lab for Computer Science, — 1993 - 1999
  Researcher in the Condensed Matter Theory and in the Information Mechanics Groups.

RECENT PROFESSIONAL AFFILIATIONS

Founding Lead Editor, ***Physical Review Research***, American Physical Society, 2019-2023.

President, **The Network Science Society**, June 2015-June 2018.

Science Steering Committee, **Santa Fe Institute**, 2009-2015.

Advisory Board, ***Quanta Magazine***, Simmons Foundation, 2017-2021.

Editorial Board, ***Scientific Reports***, Nature Publishing Group, 2013-2015.

Associate Editor, ***Journal of Complex Networks***, Oxford University Press, 2013-2017.

Editorial Board, ***IEEE Transactions on Network Science and Engineering***, 2014-2020.

Managing Editor, ***Internet Mathematics***, 2012-2016.

Member, **World Economic Forum**, Global Agenda Council on Complex Systems, 2013-2014.

Scientific Advisory Board, Future Resilient Systems, **National Univ. Singapore-ETH Zurich**, 2015-2018.

PUBLICATION HIGHLIGHTS

- 85 peer-reviewed journal publications.
- 12 peer-reviewed conference proceedings.
- 4 publications in *Science*.
- 3 publications in *Proceedings of the National Academy of Sciences*, including cover story in 2007.
- 5 publications in *Physical Review Letters*.
- 3 publications in *Nature Physics*, including cover story in 2015.
- Best paper of 2020 award, *Risk Analysis*
- Winner 2018 "Test of Time" award at FSE/ICSE 2018.
- ACM SIGSOFT Distinguished Paper Award, 2013.
- One edited volume, 3 book chapters, and one patent issued.

GRANT HIGHLIGHTS

- Over $20-million dollars in research funding received as PI or co-PI on 17 grants with collaborators spanning physical sciences, engineering, political science, plant biology, and primatology.
- R. M. D'Souza (PI), DoD / Army Research Office Multidisciplinary University Research Initiative (MURI), "Predicting and Controlling Systems of Interdependent Networks: Exploiting Interdependence for Control", $6,750,000, 8/2013-11/2019.
- Core member, ARL Network Science Collaborative Technology Alliance, 2009-2018.
- Funding received from NSF, ARO, AFOSR, NIH, DARPA, National Academies of Sciences, DTRA.

JOURNAL PUBLICATIONS

1. G. Mikaberidze, S. Nag Chowdhury, A. Hastings, **R. M. D'Souza**, "Consensus formation among mobile agents in networks of heterogeneous interaction venues", **Chaos, Solitons & Fractals**, 178, 114298 (2024).
2. R. Blersch, J. J. Vandeleest, A. C. Nathman, M. Posfai, **R. M. D'Souza**, B. McCowan, B. A. Beisner, "What you have, not who you know: food-enhanced social capital and changes in social behavioural relationships in a non-human primate", **Royal Society Open Science**, 11(1), 231460 (2024).
3. G. Mikaberidze*, A. Plaud*, and **R. M. D'Souza**, "Dragon kings in self-organized criticality systems", **Phys. Rev. Res.**, 5(4) L042013 (2023). *Editor's Suggestion.*
4. **R. M. D'Souza**, M. di Bernardo, and Y.-Y. Liu, "Controlling complex networks with complex nodes", **Nature Reviews Physics**, 5, 250–262 (2023).
5. J. Pung, R. M. D'Souza, D. Ghosal, and M. Zhang, "A road network simplification algorithm that preserves topological properties", **Applied Network Science**, 7, 79 (2022).
6. G. Mikaberidze* and **R. M. D'Souza**, "Sandpile cascades on oscillator networks: The BTW model meets Kuramoto", **Chaos**, 32, 053121 (2022). *Editor's Selection.*
7. J. Snyder*, W. Cai+, **R. M. D'Souza**, "Degree-targeted cascades in modular, degree-heterogeneous networks", **Physical Review Research** 4 (1), 013040, 2022.
8. K. Sengupta, M. Denkiewicz, M. Chilinski, T. Szczepinska, A. Faruk Mollah, S. Korsak, **R. M. D'Souza**, Y. Ruan, D. Plewczynski, "Multi-scale phase separation by explosive percolation with single-chromatin loop resolution", **Computational and Structural Biotechnology Journal**, 20, 3591-3603 (2022).
9. B. A. Beisner, A. Nathman, J. Vandeleest, M. Posfai, **R. M. D'Souza**, Brenda McCowan, "Novel access to food changes the social centrality of a middle-ranked female rhesus macaque", **American Journal of Primatology**, 84 (2022).
10. **R.M. D'Souza**, "Explosive Percolation Processes", **Springer Encyclopedia of Complex Systems**, 405-418, 2021.
11. A. Salova*, **R.M. D'Souza**, "Decoupled synchronized states in networks of linearly coupled limit cycle oscillators", **Physical Review Research** 2 (4), 043261, 2021.
12. W. Cai+, J. Snyder*, A. Hastings, **R.M. D'Souza**, "Mutualistic networks emerging from adaptive niche-based interactions", **Nature communications** 11 (1), 1-10, 2020.
13. K. Burghardt+, T. Hogg, **R.M. D'Souza**, K Lerman, M Posfai+, "Origins of Algorithmic Instabilities in Crowdsourced Ranking", **Proceedings of the ACM on Human-Computer Interaction** 4 (CSCW2), 1-20, 2020.
14. P.J. Gorski, K. Bochenina, J.A. Holyst, **R.M. D'Souza**, "Homophily Based on Few Attributes Can Impede Structural Balance", **Physical Review Letters** 125, 078302, 2020.

*Student or +Postdoctoral Scholar directly supervised by D'Souza.

15. C. Atkisson, P.J. Gorski, M.O. Jackson, J.A. Holyst, **R.M. D'Souza**, "Why understanding multiplex social network structuring processes will help us better understand the evolution of human behavior", **Evolutionary Anthropology** 29 (3), 102-107, 2020.
16. H. Wu*, R.G. James, R.M. D'Souza, "Correlated structural evolution within multiplex networks", **Journal of Complex Networks** 8 (2), cnaa014, 2020.
17. B. Beisner, N. Braun*, M. Posfai+, J. Vandeleest, **R.M. D'Souza**, B McCowan, "A multiplex centrality metric for complex social networks: sex, social status, and family structure predict multiplex centrality in rhesus macaques", **PeerJ** 8, e8712, 2020.
18. A. Ghasemi, M. Posfai+, **R.M. D'Souza**, "Diversity of structural controllability of complex networks with given degree sequence" **IEEE Transactions on Network Science and Engineering**, 2020.
19. A.M. Smith*, A.D. Gonzalez, L. Duenas-Osorio, **R.M. D'Souza**, "Interdependent network recovery games", Risk Analysis 40 (1), 134-152, 2020.
20. N.N. Chung, L.Y. Chew, W. Chen, **R.M. D'Souza**, C.H. Lai, "Susceptible individuals drive active social contagion", **Physical Review Research** 1 (3), 033125, 2019.
21. A. Salova*, J. Emenheiser*, A. Rupe, J.P. Crutchfield, **R.M. D'Souza**, "Koopman operator and its approximations for systems with symmetries", **Chaos: An Interdisciplinary Journal of Nonlinear Science** 29 (9), 093128, 2019.
22. A.M. Smith*, M. Posfai+, M. Rohden+, A.D. Gonzalez, L. Duenas-Osorio, **R.M. D'Souza**, "Competitive percolation strategies for network recovery", **Scientific Reports** 9, 11843, 2019.
23. **R.M. D'Souza**, J. Gomez-Gardenes, J. Nagler, A. Arenas, "Explosive phenomena in complex networks", **Advances in Physics**, 68 (3), 123-223, 2019.
24. M. Posfai+, N. Braun*, B.A. Beisner, B. McCowan, **R.M. D'Souza**, "Consensus ranking for multi-objective interventions in multiplex networks", **New Journal of Physics**, 21 (5), 055001, 2019.
25. M. Turalska, K. Burghardt+, M. Rohden+, A. Swami, **R. M. D'Souza**, "Cascading failures in scale-free interdependent networks", **Physical Review E**, 99 (3), 032308, 2019.
26. M. H. Matheny, J. Emenheiser*, W. Fon, A. Chapman, A. Salova*, M. Rohden+, J. Li, M. Hudoba de Badyn, M. Posfai+, L. Duenas-Osorio, M. Mesbahi, J. P. Crutchfield, M. C. Cross. **R. M. D'Souza**, M. L. Roukes, "Exotic states in a simple network of nanoelectromechanical oscillators", **Science**, 363 (6431), March 8, 2019.
27. L. Tang, X. Wu, J. Lü, J Lu, **R. M. D'Souza**, "Master stability functions for complete, intralayer, and interlayer synchronization in multiplex networks of coupled Rössler oscillators", **Physical Review E** 99 (1), 012304, 2019.
28. **R. M. D'Souza**, "Unlocking the Science of Success" (Book review of The Formula), **Science** 362 (6420), 1253-1253, 2018.
29. Y. Wang, X. Wu, J. Lü, J Lu, **R. M. D'Souza**, "Topology identification in two-layer complex dynamical networks", **IEEE Transactions on Network Science and Engineering**, 2018.
30. M. Pósfai+, **R. M. D'Souza**, "Talent and experience shape competitive social hierarchies", **Physical Review E** 98 (2), 020302R, 2018. (Rapid Communication.)
31. Y. Lin*, K. Burghardt+, M. Rohden+, P. A. Noël+, **R. M. D'Souza**, "Self-organization of Dragon King failures", **Physical Review E** 98 (2), 022127, 2018.
32. P. E. Smaldino, **R. M. D'Souza**, Z. Maoz, "Resilience by structural entrenchment: Dynamics of single-layer and multiplex networks following sudden changes to tie costs", **Network Science** 6 (2), 157-175, 2018.
33. X. Wei, J. Emenheiser*, X. Wu, J. Lu, **R. M. D'Souza**, "Maximizing synchronizability of duplex networks", **Chaos**, 28 (1), 013110, 2018.
34. **R. M. D'Souza**, "Curtailing cascading failures" (Perspective), **Science**, 358 (6365), 860-861, 2017.

35. S. Eshghi, V. Preciado, S. Sarkar, S. Venkatesh, Q. Zhao, **R. M. D'Souza**, A. Swami, "Spread, then Target, and Advertise in Waves: Optimal Budget Allocation Across Advertising Channels", **IEEE Transactions on Network Science and Engineering**, 2018.
36. A. D. González, A. Chapman, L. Dueñas-Osorio, M. Mesbahi, **R. M. D'Souza**, "Efficient infrastructure restoration strategies using the recovery operator", **Computer-Aided Civil and Infrastructure Engineering**, 32 (12), 991-1006, 2017.
37. A. Smith*, A. D. Gonzalez, L. Dueñas-Osorio, **R. M. D'Souza**, "Interdependent Network Recovery Games", **Risk Analysis**, 2017.
38. W. Fon, M. Matheny, J. Li, L. Krayzman, M. Cross, **R. M D'Souza**, J. P. Crutchfield, M. L. Roukes, "Complex dynamical networks constructed with fully controllable nonlinear nanomechanical oscillators", **Nano Letters**, 17 (10), 59775983, 2017.
39. A. Waagen*, **R. M. D'Souza**, T. C. Lu, "Explosive percolation on directed networks due to monotonic flow of activity", **Physical Review E**, 96 (1), 012317, 2017.
40. M. Pósfai+, J. Gao, S. P. Cornelius, A.-L. Barabási, **R. M. D'Souza**, "Controllability of multiplex, multi-timescale networks", **Physical Review E**, 94 (3), 032316 2016.
41. J. Emenheiser*, A. Chapman, M. Pósfai+, J. P. Crutchfield, M. Mesbahi, **R. M. D'Souza**, "Patterns of patterns of synchronization: Noise induced attractor switching in rings of coupled nonlinear oscillators", **Chaos** 26 (9), 094816, 2016.
42. C. D. Brummitt*, G. Barnett, and **R. M. D'Souza**, "Coupled catastrophes: sudden shifts cascade and hop among interdependent systems", **Journal of the Royal Society Interface**, **12**: 20150712, 2015.
43. **R. M. D'Souza** and Jan Nagler, "Anomalous critical and supercritical phenomena in explosive percolation", **Nature Physics**, **11**(7), 531, 2015. (Cover article.)
44. A. Waagen*, G. Verma, K. Chan, A. Swami, **R. M. D'Souza**, "Effect of zealotry in high-dimensional opinion dynamics models", **Physical Review E**, **91**, 022811, 2015.
45. S. Johnson* and **R. M. D'Souza**, "Inequality and Network Formation Games", **Internet Mathematics**, **11**(3), 253-276, 2015.
46. Wei Chen, Zhiming Zheng, Xin Jiang and **R. M. D'Souza**, "Multiple discontinuous percolation transitions on scale-free networks", **Journal of Statistical Mechanics**, P04011, 2015.
47. J. Gao, Y.-Y. Liu, **R. M. D'Souza**, and A.-L. Barabási, "Target control of complex networks", **Nature Communications**, **5**, 5415, 2014.
48. J. C. Flack and **R. M. D'Souza**, "The Digital Age and the Future of Social Network Science and Engineering", **Proceedings of the IEEE**, **102** (12), 2014.
49. A. Waagen* and **R. M. D'Souza**, "Given enough choice, simple local rules percolate discontinuously", **Eur. Phys. J. B**, **87**: 304, 2014.
50. W. Chen, M. Schröder, **R. M. D'Souza**, D. Sornette, and J. Nagler, "Microtransition cascades to percolation", **Physical Review Letters**, **112**, 155701, 2014.
51. P.-A. Noël+, C. D. Brummitt*, **R. M. D'Souza**, "Bottom-up model of self-organized criticality on networks", **Physical Review E**, **89**, 012807, 2014.
52. V. S. Vijayaraghavan*, P.-A. Noël+, A. Waagen*, and **R. M. D'Souza**, "Growth dominates choice in network percolation", **Physical Review E**, **88**, 032141, 2013.
53. W. Chen*, X. Cheng, Z. Zheng, N.N. Chung, **R. M. D'Souza**, J. Nagler, "Unstable supercritical discontinuous percolation transitions", **Physical Review E**, **88**, 042152, 2013.
54. P.-A. Noël+, C. D. Brummitt*, and **R. M. D'Souza**, "Controlling self-organizing dynamics on networks using models that self-organize", **Physical Review Letters**, **111**, 078701, 2013. **Selected as "Editor's Suggestion" for that issue**.

55. C. D. Brummitt*, P. D. H. Hines, I. Dobson, C. Moore, **R. M. D'Souza**, "Transdisciplinary electric power grid science", **Proc. Natl. Acad. of Sci. USA**, **110** (3), 12159, 2013.

56. W. Chen*, J. Nagler, X. Cheng, X. Jin, H. Shen, Z. Zheng, and **R. M. D'Souza**, "Phase transitions in supercritical explosive percolation", **Physical Review E** **87**, 052130, 2013.

57. **R. M. D'Souza**, "Complex networks: A winning strategy", (News and Views) **Nature Physics** **9**, 212–213, 2013.

58. Wei Chen*, Z. Zheng, and **R. M. D'Souza**, "Deriving an underlying mechanism for explosive percolation", **Europhysics Letters**, **100** (6), 66006, 2012.

59. C. D. Brummitt*, **R. M. D'Souza** and E. A. Leicht+, "Suppressing cascades of load in interdependent networks" **Proc. Natl. Acad. of Sci. USA**, **109** (12) E680-E689, 2012.

60. K. J. Schrenk, A. Felder, S. Deflorin, N. A. M. Araujo, **R. M. D'Souza**, H. J. Herrmann, "BFW model on the lattice, yielding a discontinuous percolation transition", **Physical Review E** **85**, 031103 2012.

61. Martinelli F, Uratsu S, Albrecht U, Reagan RL, Phu ML, Britton M, Buffalo V, Fass J, Leicht E+, Zhao W, Lin D, **D'Souza R. M.**, Davis CE, Bowman KD, Dandekar AM. "Transcriptome Profiling of Citrus Fruit in Response to Huanglongbing Disease", **PLOS ONE**, **7**(5): e38039, 2012.

62. Wei Chen* and **R. M. D'Souza**, "Explosive percolation with multiple giant components" **Physical Review Letters**, **106**, 115701, 2011.

63. Haoran Wen*, E. A. Leicht+, and **R. M. D'Souza**, "Improving community detection in networks by targeted node removal" **Physical Review E**, **83**, 016114, 2011.

64. D. R. Wuellner*, S. Roy+, **R. M. D'Souza**, "Resilience and rewiring of the passenger airline networks in the United States" **Physical Review E**, **82**, 056101, 2010.

65. **R. M. D'Souza** and M. Mitzenmacher, "Local cluster aggregation models of explosive percolation", **Physical Review Letters**, **104**, 195702, 2010.

66. Dandekar, A.M., Martinelli, F., Zhao, W., Bhushan, A., Davis, C.E., Skogerson, K., Fiehn, O., Leicht, E.+, **D'Souza, R. M.** "Non-destructive disease detection in citrus through the analysis of induced volatile organic compounds", **Citrograph**, **1**(5): 17-20, 2010.

67. A. M. Dandekar, Martinelli F, Davis CE, Bhushan A, Zhao W, Fiehn O, Skogerson K, Wohlgemuth G, **D'Souza R M**, Roy S, Reagan R, Lin D, Bruening G, Cary RB, Pardington P, Gupta G. "Analysis of Early Host Responses for Asymptomatic Disease Detection and Management of Specialty Crops", **Critical Reviews in Immunology**, **30** (3), 2010.

68. D. Achlioptas, **R. M. D'Souza** and J. Spencer, "Explosive Percolation in Random Graphs", **Science**, **323** (5920) 1453-1455, 2009.

69. **R. M. D'Souza**, "Complex networks: Structure comes to random graphs", **Nature Physics**, **5** (9) 627-628, 2009.

70. V. Filkov, Z. M. Saul, S. Roy+, **R. M. D'Souza**, P. T. Devanbu, "Modeling and verifying a broad array of network properties", **Europhysics Letters**, **86** 28003, 2009.

71. **R. M. D'Souza** and S. Roy+, "Network Growth with Feedback", **Physical Review E** **78** 045101(R) (Rapid Communication), 2008.

72. N. J. Linesch* and **R. M. D'Souza**, "Periodic States, Local Effects and Coexistence in the BML Traffic Jam Model", **Physica A** **387** 6170-6176, 2008.

73. **R. M. D'Souza**, P. L. Krapivsky and C. Moore, "The power of choice in growing trees", **European Physical Journal B**, **59** (4), 535-543, 2007.

74. **R. M. D'Souza**, C. Borgs, J. T. Chayes, N. Berger, R. D. Kleinberg, "Emergence of Tempered Preferential Attachment From Optimization", **Proc. Natl. Acad. Sci. U.S.A.**, **104** (15) 6112-6117, 2007. **(Cover story).**

75. **R. M. D'Souza**, "BML revisited: Statistical Physics, Computer Simulation and Probability". **Complexity**, **12** (2) 30–39, 2006.

76. **R. M. D'Souza**, "Coexisting phases and lattice dependence of a cellular automata model for traffic flow", **Physical Review E 71**, 2005.
77. N. Berger, C. Borgs, J. T. Chayes, **R. M. D'Souza**, and R. D. Kleinberg. "Degree Distribution of Competition-Induced Preferential Attachment Graphs", **Combinatorics, Probability and Computing 14** (5-6), 697-721, 2005.
78. N. Berger, C. Borgs, J. T. Chayes, **R. M. D'Souza**, and R. D. Kleinberg. "Competition-Induced Preferential Attachment", **Lecture Notes in Computer Science 3142** 208-221, 2004.
79. **R. M. D'Souza**, N. H. Margolus, and M. A. Smith. "Dimension-splitting for simplifying lattice-gas models of diffusion", **Journal of Statistical Physics**, **107** (1), 2002.
80. **R. M. D'Souza** and N. H. Margolus. "Thermodynamically reversible generalization of Diffusion Limited Aggregation", **Physical Review E 60** (1), 1999.
81. **R. M. D'Souza**, Y. Bar-Yam, and M. Kardar. "Sensitivity of Ballistic Deposition to Pseudorandom Number Generators", **Physical Review E 57** (5), 1998.
82. **R. M. D'Souza**. "Anomalies in Simulations of Nearest Neighbor Ballistic Deposition", **Int. Jour. of Modern Physics C 8** 941, 1997.
83. A. A. MacDowell, et al., "Soft-X-Ray Projection Imaging with a 1:1 Ring-Field Optic", **Applied Optics 32** (34), 1993.
84. J. M. Calvert, et al., "Projection x-ray lithography with ultrathin imaging layers and selective electroless metallization", **Optical Engineering 32** (10), 2437-2445, 1993.
85. D. M. Tennant, et al., "Reflective mask technologies and imaging results in soft x-ray projection lithography", **Journal of Vacuum Science & Technology B**, **9** (6) 3176-3183, 1991.

REFEREED CONFERENCE PROCEEDINGS

1. A. Chapman, A. D. Gonzalez, M. Mesbahi, L. Dueñas-Osorio, **R. M. D'Souza**, "Data-guided control: Clustering, graph products, and decentralized control", 56th IEEE Annual Conference on Decision and Control (CDC), pps 493-498, Dec 2017.
2. S. Johnson*, J. George and **R. M. D'Souza**, "Strategic Seeding of Rival Opinions", 6th EAI International Conference on Game Theory for Networks, GAMENETS, May 11-12 2016.
3. S. Johnson* and **R. M. D'Souza**, "Brokerage and Closure in A Strategic Model of Social Capital", 32nd ACM Symposium on Principles of Distributed Computing, July 2013.
4. D. Posnett*, **R. M. D'Souza**, P. Devanbu, V. Filkov, "Dual ecological measures of focus in software development", 35th ACM/IEEE Intl. Conf. on Software Engineering, May 2013. (Paper acceptance rate: 18.5%) **Winner, ACM SIGSOFT Distinguished Paper Award**.
5. A. Nazir, A. Waagen*, V. Vijayaraghavan*, C.-N. Chuah, **R. M. D'Souza**, B. Krishnamurthy, "Beyond Friendship: Modeling user activity graphs in social network-based applications", ACM Internet Measurement Conference, Nov 2012. (Paper acceptance rate: 20%)
6. W. Elmenreich, **R. M. D'Souza**, C. Bettstetter and H. de Meer, "A Survey of Models and Design Methods for Self-Organizing Networked Systems", In Proceedings of the Fourth International Workshop on Self-Organizing Systems. Springer Verlag, 2009.
7. C. Bird*, D. Pattison, **R. M. D'Souza**, V. Filkov, P. Devanbu, "Chapels in the Bazaar? Latent Social Structure in OSS", in Proceedings of The Sixteenth ACM SIGSOFT Symposium on Foundations of Software Engineering (FSE 2008). (Paper acceptance rate: 20%)
Winner 2018 "Test of Time" award at FSE/ICSE 2018
8. **R. M. D'Souza**, D. Galvin, C. Moore, and D. Randall, "Global connectivity from local geometric constraints for sensor networks with various wireless footprints", in Procs of The Fifth International Conference on Information Processing in Sensor Networks (IPSN 2006). (Paper acceptance rate: 15%)

9. J. Silvis*, D. Niemeier, and **R. M. D'Souza**. "Social Networks and Travel Behavior: Report from an integrated travel diary", in Proceedings of the 11th International Conference on Travel Behaviour Research, Kyoto, Japan, 2006.
10. **R. M. D'Souza**, S. Ramanathan, and D. Temple Lang. "Measuring performance of ad hoc networks using timescales for information flow", in Proc of IEEE, INFOCOM 2003. (Acceptance rate: 21%)
11. J. M. Calvert, et al., "Soft x-ray (14 nm) lithography with ultrathin imaging layers and selective electroless metallization", Proc. SPIE **1924**, 30-41, 1993.
12. W. M. Mansfield, et al., "Effects of Absorption on Resist Performance in Soft X-Ray Projection Lithography", OSA Proc. on Soft X-Ray Projection Lithography **12**, 1991.

EDITED VOLUMES

1. J. C. Flack and **R. M. D'Souza** (Guest Editors), "Impact of Changing Technology on Social Networks", *Proceedings of the IEEE*, **102** (12), 2014.

BOOK CHAPTERS

1. **R. M. D'Souza**, C. D. Brummitt, and E. A. Leicht, "Modeling interdependent networks as random graphs: Connectivity and systemic risk", in *Networks of Networks – Systemic Risk and Infrastructural Interdependencies*, G. D'Agostino and A. Scala (Eds.), Springer, 2014.
2. H. R. Wen, **R. M. D'Souza**, Z. M. Saul, V. Filkov, "Evolution of Apache Open Source Software", in *Dynamics On and Of Complex Networks*, Birkhauser, Springer, 2009.
3. **R. M. D'Souza**, G. E. Homsy, and N. H. Margolus. "Simulating digital logic with the Reversible Aggregation model of cluster growth", in *New Constructions in Cellular Automata*, Oxford University Press, 2003.

PATENTS GRANTED

1. **R. M. D'Souza**, S. Ramanathan, and D. Temple Lang, "Adaptive power level setting in an ad-hoc wireless network". US Patent, 6,970,714. Granted Nov. 2005.

GRANTS FUNDED

- **"Effects of Altering Social Connectedness on Health"**. B. McCowan (PI), K. Coleman, J. Vandeleest, R. M. D'Souza, National Institutes of Health, $3,341,960, 7/1/2021-6/30/2026.
- **"Predicting and Controlling Systems of Interdependent Networks: Exploiting Interdependence for Control"**. R. M. D'Souza (PI), J. Crutchfield, L. Dueñas-Osorio, M. Mesbahi, M. Roukes, B. McCowan, DoD / Army Research Office Multidisciplinary University Research Initiative (MURI), $6,750,000, 8/2013-11/2019.
- **"Coevolution of mutualistic networks"**. R. M. D'Souza (PI), B. Uzzi, ARL Network Science Collaborative Technology Alliance, $350,000, 10/2018-9/2019.
- **"Principles of self-organization for resilience and control"**. R. M. D'Souza (PI), DARPA, $300,000, 1/2017-1/2019.
- **"Coevolution and critical phase transitions"**. C. Aggarwal (PI), R. M. D'Souza, P. Mohapatra, B. Uzzi, ARL Network Science Collaborative Technology Alliance, $880,000, 10/2016-9/2018.
- **"Robustness, resilience and emergent properties of interdependent networks"**. R. M. D'Souza (PI), Defense Threat Reduction Agency, $734,125, 9/2009-8/2016.
- **"NeTS: Medium: Towards Building Time Capsule for Online Social Activities"**. Chen-Nee Chuah (PI), R. M. D'Souza, National Science Foundation, $609,000 9/2013 - 8/2016.

- **"The Effect of Shocks on Overlapping and Functionally Interacting Social and Political Networks: A Multi-Method Approach"**. Zeev Maoz (PI), George Barnett, R. M. D'Souza, Brandon Kinne, Camber Warren. ARO Minerva Research Initiative, $1,800,000, 9/2015-8/2018.
- **"Controllability of Complex Networks"**. A.-L. Barabasi (PI), R. M. D'Souza, J. George, J. H. Cho, ARL Network Science Collaborative Technology Alliance, $880,000, 8/2014-9/2016.
- **"ICES: The Effects of Shocks on Interacting Social and Physical Networks "**. Z. Maoz (PI), G. Barnett, R. M. D'Souza, K. Joyce, National Science Foundation, $398,874, 9/2012-8/2014.
- **"Structure and Function of Task-Oriented Social Networks"**. V. Filkov (PI), P. T. Devanbu, R. M. D'Souza, D. Felmlee, $700,000, 9/2011-8/2014.
- **"Quality of Information Aware Networks for Tactical Applications (QUANTA)"**. P. Mohapatra (PI), R. M. D'Souza, K. Levitt, F. Wu, Q. Zhao. Army Research Lab, Collaborative Technology Alliance. $2.5M, 9/2009 - 8/2014.
- **"Network Infrastructure: realizing the potential of underutilized urban public land through the integration of data, analysis and design"**. N. de Monchaux (PI), J. Wolch, R. M. D'Souza, CITRIS, $50,000, 9/2012-8/2013.
- **"Design Principles for Resilient Critical Infrastructure"** R. M. D'Souza (PI), National Academies Keck Futures Initiative, $50,000, 5/2009-12/2011.
- **"Longitudinal effects of Design in Open Source Projects"**. P. Devanbu (PI), R. M. D'Souza, V. Flikov, G. Hsu and A. Swaminathan. NSF Science of Design Program. $750,000, 9/2006 - 8/2009.
- **"Development and testing of a generalized reagentless chemical sensor for the real-time detection of citrus plant and fruit response"**. A. Dandekar (PI), C. E. Davis, R. M. D'Souza and O. Fiehn. UC Discovery Grant. $120,000, 5/2008 - 4/2009.
- **"Network Flows"**. R. M. D'Souza (PI). Grant, JFE R&D Corporation. $30,000, 8/2007.

REFEREE DUTIES

Recurring referee for: Science, Nature, PNAS, Nature Physics, Physical Review Letters, Physical Review E, PLOS One, Chaos, J Stat Phys, Physica A, NJP, J Phys A, SIAM Journal on Discrete Mathematics, NSF grant review panels, IEEE Transactions on Networking, IEEE Communications Letters, IEEE Foundations of Computer Science (FOCS) 2006, IEEE Infocom 2003 and 2004, Nonlinearity, Journal of Multivariate Logic, Cottrell College Science Awards 2006, United States-Israel Binational Science Foundation 2007, European Commission European FET Flagship Initiatives Area 2012.

SELECT CONFERENCE ORGANIZATION

- Organizer, National of Academy of Engineering Northern California Regional Meeting, May 30, 2024.
- Main organizer, Dynamics Days 2024 (The 42nd annual event), Jan 8-10, 2024.
- Scientific Steering Committee, NetSci 2016, NetSci X 2016, Netsci 2017, NetSci X 2017, NetSci X 2018, NetSci 2018, NetSciX 2019.
- Advisory Board, Complex Networks Conference 2017, 2018, 2019.
- Faculty organizer, International workshop on "Multidimensional networks symposium", UC Davis May 20-22, 2016.
- Program Committee, ICCS workshop on Paradigms for Control in Social Systems, 2015.
- NetSci 2014, International School and Conference on Network Science. **General Chair**.
- IEEE NetSciCom 2013, and IEEE NetSciCom 2012, Technical Program Committee.
- 10th Workshop on Algorithms & Models for the Web Graph (WAW'13), Technical Program Committee.
- NetSci 2013, Program Committee.

- Organizer: "Power Grids as Complex Networks: Formulating Problems for Useful Science and Science Based Engineering", Santa Fe Institute, May 16-18, 2012.
- NetONets, Networks of Networks: Systemic Risk and Infrastructural Interdependencies, Scientific Steering Committee, 2012, 2013, 2014.
- 9th Workshop on Algorithms & Models for the Web Graph (WAW'12), Technical Program Committee.
- 6th International Workshop on Self-Organizing Systems (IWSOS 2012), March 15-16, 2012, Delft, The Netherlands. Technical Program Committee.
- U.S. National Academy of Sciences, Kavli Indo-US Frontiers of Science, Symposium Chair, April 2011.
- Statistical and Applied Mathematical Sciences Institute (SAMSI), 2010-2011 Program on Complex Networks. (Dynamics of networks subprogram)
- Organizer: "Emergent Properties and Resilience of Interacting Networks", Santa Fe Institute, June 21-23, 2010.
- U.S. National Academy of Sciences, Kavli Japan-US Frontiers of Science, Symposium Chair, Dec. 2008.
- U.S. National Academy of Sciences, Kavli Japan-US Frontiers of Science, Program Cmmt, Dec. 2007.
- Organizer: "The Science of Complex Systems" Seminar Series, UC Davis, Spring 2006 and Fall 2006.
- Institute for Complex Systems Research of Valparaiso (ISCV)/Santa Fe Institute, Inaugural Residency Month, Valparaiso, Chile, December 2006.
- European Conference on Complex Systems 2006, Technical Program Committee, September 2006.

HIGHLIGHTS OF INVITED TALKS

1. Colloquium, **CTCS Center**, Joint center of IIT Madras, India and Potsdam Institute for Climate Research, Germany, Jan 29 2024.
2. Keynote talk, **Critical Transitions IV Workshop** Potsdam Institute for Climate Impact Research, Dec 20, 2023.
3. Colloquium, **Northwestern Institute on Complex Systems**, Northwestern University, Oct 4, 2023.
4. Invited speaker, **ELLIIT Focus Period on Network Dynamics and Control Symposium**, Linköping, Sweden, Sept 21, 2023.
5. Plenary speaker, **28th International Conference on Statistical Physics; StatPhys28**, Tokyo Japan, Aug 9, 2023.
6. Colloquium, **Rochester Institute of Technology, School of Math Sciences**, Nov 9, 2021.
7. Keynote speaker, Criticality in Socio-Economic Systems Satellite, **International Conference on Complex Systems**, Oct 28, 2021.
8. Keynote speaker, Multiplex Networks Satellite, **International Conference on Complex Systems**, Oct 22, 2021.
9. Plenary talk, **Annual Meeting of the German Physical Society**, Sept 27, 2021.
10. Invited Speaker, **Institute for Advanced Technische Universitat Munich**, Workshop on Network Dynamics, July 26, 2021.
11. Invited Speaker, **SIAM minisymposium on opinion dynamics**, July 21, 2021.
12. Colloquium, **Indiana University**, NSF NRT on complex systems, March 25, 2021.
13. Invited talk **American Physical Society March meeting**, March 18, 2021.
14. Invited talk, **Indiana Univerisity AccelNet-MultiNet Program**, Dec 8th, 2020.
15. Plenary lecture, **Dynamics Days Asia 2020**, Nov 16-20, 2020.
16. Plenary lecture, **European Control Conference 2019**, 25-28 June 2019, Naples, Italy.

17. Colloquium, Operations Research & Financial Engineering, **Princeton University**, Apr17, 2019.
18. Invited speaker, **Complenet'19**, 18-21 March 2019, Tarragona, Spain.
19. Invited speaker, **NetSci X 2019**, Jan 3-5, 2019, Santiago, Chile.
20. Plenary speaker, **SIAM Network Science 2018**, Portland Oregon, July 12, 2018.
21. Keynote speaker, **NetONets 2018**, satellite workshop of NetSci 2018, Paris France, June 12, 2018.
22. Invited talk, **American Physical Society March meeting**, March 8, 2018.
23. Keynote speaker, **NetSci X 2018**, Hangzhou China, Jan 5-8, 2018.
24. Keynote Speaker, **Conference on Complex Systems**, Cancun Mexico, Sept 17-22, 2017.
25. Keynote Speaker, **Symposium on Controlling Complex Systems**, NetSci 2017, June 19, 2017.
26. Keynote Speaker, **Complex Networks** 2016, Milan, Italy Nov 30 - Dec 2, 2016.
27. Colloquium, Physics Department, **Boston University**, March 22, 2016.
28. Invited Speaker, **APS March meeting**, Session V3: Complex Network Dynamics, March 17, 2016.
29. Invited lecture, Mechanical Engineering/IGERT seminar, **UC Santa Barbara**, Nov 9, 2015.
30. Colloquium, Applied Mathematics, **Northwestern University**, Oct 5, 2015.
31. Invited lectures, **University of Alaska**, Anchorage, Complex Systems lecture series, April 2-3, 2015.
32. Keynote Speaker, **UC Davis**, Statistical Sciences Symposium, April 10-11, 2015.
33. Invited Speaker, **UC Davis**, Institute for Social Sciences 2015 Conference, May 8, 2015.
34. Keynote Speaker, **NetSci 2015**, Zaragoza Spain, June 1-5, 2015.
35. The John von Neumann Public Lecture, **University of Wisconsin**, Nov. 5, 2014.
36. Colloquium, Stanford Network Forum, **Stanford University**, Aug. 4, 2014.
37. Invited Speaker, Berkeley Mini-Stat Mech Meeting, **UC Berkeley**, Jan. 11, 2014.
38. Colloquium, ETH Risk Center, **ETH Zurich**, October 29, 2013.
39. Invited Speaker, **SIAM dynamical systems conference**, May 19-23, 2013.
40. Distinguished Physics & Astronomy Complex Systems Seminar, **Northwestern University**, Chicago, April 25, 2013.
41. Invited Speaker, **American Physical Society March Meeting**, Baltimore MD, Mar 18-22, 2013.
42. Invited Speaker, **Dynamics Days US**, Denver CO, Jan 3-6, 2013.
43. Physics Colloquium, **UC Riverside**, Nov 29, 2012.
44. Invited speaker, "Coupled Networks, Dragon Kings and Explosive Percolation: New Views on Extreme Events", Workshop of the ETH Risk Center, **ETH Zurich**, Oct 26th, 2012.
45. Invited speaker, **European Conference on Complex Systems**, Sept 6, 2012.
46. Lecturer, 8th Cornell Probability Summer School, **Cornell University**, July 16-27, 2012.
47. Distinguished Lecturer in Computer Science Series, **UC Irvine**, April 27, 2012.
48. **Santa Fe Institute** Colloquium, May 16, 2012.
49. **America Association for the Advancement of Science**, Annual meeting, Invited Lecture, Vancouver British Columbia, Feb. 17, 2012.
50. **Cornell University**, Center for Applied Math, Colloquium, Dec. 2, 2011.
51. **Northwestern University**, Invited speaker, Frontiers in Networks Science Workshop, Dec. 1, 2011.
52. **Tycho Brahe Planetarium**, One of four discussants on nature on time, Copenhagen Denmark, Aug. 29, 2011. Video at `http://fqxi.org/setting-time-aright.html`
53. **NetSci 2011**, Plenary Lecture, Hungarian Academy of Sciences, June 9, 2011.
54. **American Physical Society**, Invited Speaker, March Meeting, Mar. 22, 2011.

55. Invited lecture, **TTI Vanguard**, Matters of Scale, London England, July 21, 2010.
56. **Rockefeller Foundation**, Science of Cities Workshop, Bellagio Italy, July 29, 2010.
57. **Microsoft Research** Colloquium, Oct 7, 2009.
58. **NetSci 2009**, Plenary lecture, Venice Italy, July 1, 2009.
59. **Massachusetts Institute of Technology**, LIDS Seminar, Dec. 7, 2009.
60. **Massachusetts Institute of Technology**, Combinatorics Seminar, Dept of Math, Oct 28, 2009.
61. **University of Klagenfurt**, Invited Lecture, Klagenfurt Austria, July 14, 2009.
62. Invited lecture, **Canadian Discrete and Algorithmic Mathematics Conference**, Montreal, May 25, 2009.
63. **Perimeter Institute for Theoretical Physics** Colloquium, Ontario Canada, May 20, 2009.
64. **Massachusetts Institute of Technology**, Invited Lecture, Engineering Systems Division, 4/9/2009.
65. **University of California Davis** Physics Colloquium, February 9, 2009.
66. **Stanford University** ICME Colloquium, May 19, 2008.
67. **University of Maryland** Physics Colloquium, 4/29/2008.
68. Invited lecture, The Network Resilience Challenge, **Secretary of Defense Highlands Forum**, Wilmington, DE, Oct 5-7, 2008.