

Gaogao Dong



Name: Gaogao Dong

Research Fields: Analysis and Modeling of Complex Systems, Theory and Application of Nonlinear System, Data analysis theory and applications, Complex network theory and applications

Postgraduate Enrollment Specialty: Mathematics, Control science and engineering

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Title: Professor, Doctoral Supervisor

Research Field & Interest: Analysis and Modeling of Complex Systems, Theory and Application of Nonlinear System, Data analysis theory and applications, Complex network theory and applications

Postgraduate Enrollment Specialty:

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Currently accepting applications for Master's students, Ph.D. students, and Postdoctoral positions, and warmly welcome you to join us.

Learning and Working Experience

- 2014-Now : Lecturer, Associate Professor, Professor, School of Mathematical Sciences, Jiangsu university
- Aug. 2018-Aug. 2019: Boston University, USA, Visiting Scholar
- Aug. 2011-Aug. 2013: Joint doctoral student at Boston University, USA
- Sep. 2008-Dec. 2013: Ph.D in Department of Mathematics, Jiangsu University
- Sep. 2006-July 2008: Master in Department of Mathematics, Jiangsu University

Part-time Academic and Social Work:

- May. 2022-Now, Permanent member of the Key Laboratory of Numerical Simulation of Large-scale Complex Systems, Ministry of Education

- Oct. 2018-Now, Member of the Committee on Complex Networks and Complex Systems in Chinese Mathematics and Applied Mathematics Association
- Aug. 2019-Now, Member of the Academic Committee on Statistical Physics and Complex Systems in China
- 2021-Now, Deputy editor, Frontiers in Physics, JCR Q2
- 2017-Now, Editorial board, International Journal of Nonlinear Science

Teaching Courses

- Advanced System Engineering (Ph.D), Introduction to Complex Networks (overseas Ph.D), Advanced System Engineering (overseas Ph.D)
- System Modeling and Analysis(Master)
- Advanced Mathematics、Probability Statistics、Abstract Algebra, etc.(Undergraduate)

Monographs and Translations:

- Advanced Mathematics (I, II), Jiangsu University Press, 2019, Chief Editor
- Construction of complex data networks and its application in management science, Science Press, 2021, co-editor
- Nonlinear dynamics and chaos, Mechanical Industry Press, 2017, translator

Research projects:

- National Natural Science Foundation Project: Research on network failure behavior and recovery strategies of networks with generalized topological features(61973143), Jan. 2020-Dec. 2023, PI.
- International Cooperation Projects - Royal Society International Cooperation Projects: The future of algorithmic competition: a network-based perspective, Cooperating with Oxford university, May 2022-Feb. 2023, co-PI.
- National Natural Science Foundation Project: Research on network robustness of weighted networks under different attack strategies (61403171), PI, completed.
- Outstanding Youth Academic Backbone Project of Qinglan project of Jiangsu Province in 2020, Jan. 2020-Dec. 2022, PI, completed.

Honors and Awards:

- Youth Award of the Jiangsu Society for Industrial and Applied Mathematics, 2020.
- The First Prize of Science and Technology of Jiangsu Province, 2022, (Ranked

second).

- The 17th Outstanding Achievements Award of Philosophy and Social Sciences of Jiangsu Province, 2023, (Ranked Third).
- The second prize of the 7th Young Teachers Teaching Competition of Foundations of Mathematics in Colleges and Universities of Jiangsu Province, 2021.
- The Third Prize of Excellent Achievements Award of Scientific Research in Colleges and Universities of Jiangsu Province, 2021, (Ranked First).
- The Third Prize in the Micro-lecture Teaching Competition of Jiangsu University, 2022.

Academic Publications:

- **Dong G.**, Wang F., Shekhtman L. M., Danziger M. M., Fan J., Du R., Liu J., Tian L., Stanley H. E.*, Havlin S., Optimal resilience of modular interacting networks, PNAS, 2021, 118(22), e1922831118.
- **Dong G.**, Fan J., Shekhtman L. M., Shai S., Du R., Tian L.*, Chen X., Stanley H. E.*, Havlin S., Resilience of networks with community structure behaves as if under an external field, PNAS, 2018, 115(27), 6911-6915.
- Liu Y., Sanhedrai H., **Dong G.***, Shekhtman L. M.*, Wang F., Buldyrev S. V., Havlin S.*, Efficient network immunization under limited knowledge, National Science Review, 2021, 8(1), nwaa229.
- **Dong G.**, Qing T., Du R.*, Wang C., Li R., Wang M., Tian L., Chen, L., Vilela A. L. M., Stanley H. E., Complex network approach for the structural optimization of global crude oil trade system, Journal of Cleaner Production, 2020, 251, 119366.
- **Dong G.**, Luo Y., Liu Y., Wang F.*, Qin H., Vilela A. L., Percolation behaviors of a network of networks under intentional attack with limited information, Chaos, Solitons & Fractals, 2022, 159, 112147.
- **Dong G.**, Xiao H., Wang F., Du R.*, Shao S., Tian L., Stanley H. E., Havlin S., Localized attack on networks with clustering, New Journal of Physics, 2019, 21(1), 013014.
- **Dong G.**, Wang N., Wang F.*, Qing T., Liu Y., Vilela A. L., Network resilience of non-hub nodes failure under memory and non-memory based attacks with limited information, Chaos: An Interdisciplinary Journal of Nonlinear Science, 2022, 32(6), 063110.
- **Dong G.**, Yao Q., Wang F.*, Du R.*, Vilela A. L., Stanley H. E., Percolation on coupled networks with multiple effective dependency links, Chaos: An Interdisciplinary Journal of Nonlinear Science, 2021, 31(3), 033152.

- **Dong G.**, Chen Y., Wang F., Du R.*, Tian L., Stanley H. E., Robustness on interdependent networks with a multiple-to-multiple dependent relationship, *Chaos: An Interdisciplinary Journal of Nonlinear Science*, 2019, 29(7), 073107.
- **Dong G.***, Zhang J., Tian L., Chen Y., Zhang M., Nan Z., Structural properties evolution and influencing factors of global virtual water scarcity risk transfer network, *Energies*, 2023, 16(3), 1436.
- **Dong G.***, Du R., Tian L., Liu R., Robustness of network of networks with interdependent and interconnected links, *Physica A: Statistical Mechanics and its Applications*, 2015, 424, 11-18.
- **Dong G.***, Tian L., Du R., Fu M., Stanley H. E., Analysis of percolation behaviors of clustered networks with partial support-dependence relations, *Physica A: Statistical Mechanics and its Applications*, 2014, 394, 370-378.
- **Dong G.***, Duan D.*, Xia Y.*, Network resilience and robustness: Theory and applications, *Frontiers in Physics*, 2022, 10, 972037.
- **Dong G.***, Duan D.*, Xia Y.*, A briefing survey on advances of coupled networks with various patterns, *Frontiers in Physics*, 2021, 9, 795279.
- **Dong G.***, Du R., Tian L., Liu R., Percolation on interacting networks with feedback-dependency links, *Chaos: An Interdisciplinary Journal of Nonlinear Science*, 2015, 25(1), 013101.
- **Dong G.***, Du R., Tian L., Jia Q., A novel 3D autonomous system with different multilayer chaotic attractors, *Physics Letters A*, 2009, 373(42), 3838-3845.
- **Dong G.***, Zheng S., Tian L., Du R., Sun M., Shi Z., The analysis of a novel 3-D autonomous system and circuit implementation, *Physics Letters A*, 2009, 373(46), 4227-4238.
- **Dong G.***, Gao J., Du R., Tian L., Stanley H. E., Havlin S., Robustness of network of networks under targeted attack, *Physical Review E*, 2013, 87(5), 052804.
- **Dong G.***, Gao J., Tian L., Du R., He Y., Percolation of partially interdependent networks under targeted attack, *Physical Review E*, 2012, 85(1), 016112.
- **Dong G.***, Tian L., Xia J., Zheng S., Du R., Sudden occurrence of chaos-ii in nonsmooth maps, *International Journal of Bifurcation and Chaos*, 2010, 20(12), 4159-4174.
- **Dong G.**, Qing T., Tian L., Du R.*, Li J., Optimization of crude oil trade structure: a complex network analysis, *Complexity*, 2021, 1-11.
- **Dong G.***, Sun Z., Sun N., Wang F., Understanding percolation phase transition behaviors in complex networks from the macro and meso-micro perspectives,

Europhysics Letters, 2022, 139(6), 61001.

- **Dong G.***, Du R., Hao H., Tian L., Modified localized attack on complex network, Europhysics Letters, 2016, 113(2), 28002.
- **Dong G.***, Tian L., Zhou D., Du R., Xiao J., Stanley H. E., Robustness of n interdependent networks with partial support-dependence relationship, Europhysics Letters, 2013, 102(6), 68004.
- **Dong G.***, Hao H., Du R., Tian L., Attacking mode based on shell structure of complex networks, International Journal of Nonlinear Science, 2015, 20(3), 148-153.
- **Dong G.**, Jin R., Gao L., Tian L.*, A new type frontward-response control SOC, International Journal of Nonlinear Science, 2008, 6(1), 3-10.
- **Dong G.***, Du R., Hao H., Tian L., Shell attack on interdependent networks, 2016 35th Chinese Control Conference (CCC), 2016, 1198-1201.
- Du R.*, Wang Y., **Dong G.***, Tian L., Liu Y., Wang M., Fang G., A complex network perspective on interrelations and evolution features of international oil trade, 2002-2013, Applied Energy, 2017, 196, 142-151.
- Wang F., Tian L.*, Du R., **Dong G.***, Universal law in the crude oil market based on visibility graph algorithm and network structure, Resources Policy, 2021, 70, 101961.
- Du R., **Dong G.***, Tian L., Wang Y., Zhao L., Zhang X., Vilela A. L., Stanley H. E.*, Identifying the peak point of systemic risk in international crude oil importing trade, Energy, 2019, 176, 281-291.
- Wang F., **Dong G.***, Tian L., Stanley H. E., Percolation behaviors of finite components on complex networks, New Journal of Physics, 2022, 24(4), 043027.
- Du R., Wu Q., **Dong G.***, Tian L., Vilela A. L. M., Zhao L., Zheng X., Natural gas scarcity risk for countries along the belt and road, Energies, 2022, 15, 1053.
- Du R., Li J., **Dong G.***, Tian L., Qing T., Fang G., Dong Y., Percolation analysis of urban air quality: A case in China, Physica A: Statistical Mechanics and its Applications, 2020, 541, 123312.
- Wang F., Tian L.*, Du R., **Dong G.***, The robustness of interdependent weighted networks, Physica A: Statistical Mechanics and its Applications, 2018, 508, 675-680.
- Du R., **Dong G.***, Tian L., Liu R., Targeted attack on networks coupled by connectivity and dependency links, Physica A: Statistical Mechanics and its Applications, 2016, 450, 687-699.
- Tian Z., **Dong G.***, Du R., Ma J., Non-consensus opinion model with a neutral view on complex networks, Physica A: Statistical Mechanics and its Applications, 2016, 450, 601-608.

- Qing T, **Dong G.***, Wang F., Du R., Tian L., Phase transition behavior of finite clusters under localized attack, *Chaos: An Interdisciplinary Journal of Nonlinear Science*, 2022, 32(2), 023105.
- Wang F., **Dong G.***, Tian L., Dynamical recovery of complex networks under a localized attack, *Algorithms*, 2021, 14(9), 274.
- Du R., Chen Y., **Dong G.***, Tian L., Zhang J., Zhang N., Optimization and benefit analysis of grain trade in belt and road countries, *Entropy*, 2022, 24(11), 1667.
- Wang F., **Dong G.***, Du R., Tian L., Robustness of multiple interdependent networks under shell attack, 2017 36th Chinese Control Conference (CCC), 2017, 1447-1450.
- Zhang W., Tian Z.*, Zhang G., **Dong G.**, Spatial-temporal characteristics of green travel behavior based on vector perspective, *Journal of Cleaner Production*, 2019, 234, 549-558.
- Zubillaga B. J.*, Vilela A. L., Wang M., Du R., **Dong G.**, Stanley H. E., Three-state majority-vote model on small-world networks, *Scientific Reports*, 2022, 12(1), 282.
- Wang M., Vilela A. L. M., Du R., Zhao L., **Dong G.**, Tian L.*, Stanley H. E., Exact results of the limited penetrable horizontal visibility graph associated to random time series and its application, *Scientific Reports*, 2018, 8(1), 5130.
- Zheng S.*, **Dong G.**, Bi Q., A new hyperchaotic system and its synchronization, *Applied Mathematics and Computation*, 2010, 215(9), 3192-3200.
- Zheng S.*, Wang S., **Dong G.**, Bi Q., Adaptive synchronization of two nonlinearly coupled complex dynamical networks with delayed coupling, *Communications in Nonlinear Science and Numerical Simulation*, 2012, 17(1), 284-291.
- Zheng S.*, **Dong G.**, Bi Q., Adaptive modified function projective synchronization of hyperchaotic systems with unknown parameters, *Communications in Nonlinear Science and Numerical Simulation*, 2010, 15(11), 3547-3556.
- Fan J.*, **Dong G.**, Shekhtman L. M., Zhou D., Meng J.*, Chen X., Havlin S., Structural resilience of spatial networks with inter-links behaving as an external field, *New Journal of Physics*, 2018, 20(9), 093003.
- Wang M., Tian L.*, Xu H., Li W., Du R., **Dong G.**, Wang J., Gu J., Systemic risk and spatiotemporal dynamics of the consumer market of China, *Physica A: Statistical Mechanics and its Applications*, 2017, 473, 188-204.
- Tian L.*, Huang Y., **Dong G.**, Du R., Shi L., Robustness of interdependent and interconnected clustered networks, *Physica A: Statistical Mechanics and its Applications*, 2014, 412, 120-126.
- Zhu L., Wang F., **Dong G.***, Robustness of directed networks under localized attack,

International Journal of Nonlinear Science, 2019, 27(2), 123-128.

- Zheng S.*, **Dong G.**, Bi Q., Impulsive synchronization of complex networks with non-delayed and delayed coupling, Physics Letters A, 2009, 373 (46), 4255-4259.
- Tian L.*, **Dong G.**, Frontward-response control of sudden occurrence of chaos, Physics Letters A, 2008, 372(23), 4241-4246.
- Wang M., Vilela A. L. M., Du R., Zhao L., **Dong G.**, Tian L.*, Stanley H. E., Topological properties of the limited penetrable horizontal visibility graph family, Physical Review E, 2018, 97(5), 052117.