

Ling-Wei Kong

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Education

2019 - Present Arizona State University, Tempe, Arizona, US.

- Advisor: [Dr. Ying-Cheng Lai](#)
- Ph.D. Student in Electrical Engineering
- Expected to Graduate in 2023 Summer

2017 - 2018 Arizona State University, Tempe, Arizona, US.

- Teaching Assistant at the Department of Physics

2013 - 2017 University of Science and Technology of China, Hefei, China.

- B.S. in Theoretical Physics
- Experimental Class for the Sciences, School of the Gifted Young
- Undergraduate Research Student at Prof. Bing-Hong Wang's Group

Peer-Reviewed Publications

- J9. H. Fan, **L.-W. Kong**, X. Wang, A. Hastings, and Y.-C. Lai. Synchronization within synchronization: transients and intermittency in ecological networks. *National Science Review*, 8 (10), nwaa269 (2021).
- J8. B. Wallace, **L.-W. Kong**, A. Rodriguez, Y.-C. Lai. Synchronous transition in complex object control. *Physical Review Applied*, 16 (3), 034012 (2021).
- J7. R. Xiao, **L.-W. Kong**, Z.-K. Sun, and Y.-C. Lai. Predicting amplitude death with machine learning. *Physical Review E*, 104 (1), 014205 (2021).
- J6. **L.-W. Kong**, H. Fan, C. Grebogi, and Y.-C. Lai. Emergence of transient chaos and intermittency in machine learning. *Journal of Physics: Complexity* 2 (3), 035014 (2021).

- J5. C.-Z. Wang, **L.-W. Kong**, J. Jiang, and Y.-C. Lai. Machine learning-based approach to GPS antijamming. *GPS Solutions*, 25 (3), 1-12 (2021).
- J4. H. Fan, **L.-W. Kong**, Y.-C. Lai, and X. Wang. Anticipating synchronization with machine learning. *Physical Review Research*, 3 (2), 023237 (2021).
- J3. **L.-W. Kong**, H. Fan, C. Grebogi, and Y.-C. Lai. Machine learning prediction of critical transition and system collapse. *Physical Review Research*, 3 (1), 013090 (2021).
- J2. **L.-W. Kong** and Y.-C. Lai. Scaling law of transient lifetime of chimera states under dimension-augmenting perturbations. *Physical Review Research*, 2 (2), 023196 (2020).
- J1. **L.-W. Kong**, L. Li, R.-R. Liu, and B.-H. Wang. Percolation on networks with weak and heterogeneous dependency. *Physical Review E*, 95 (3), 032301 (2017).

Available Manuscripts

- M2. Z.-M. Zhai, **L.-W. Kong**, and Y.-C. Lai. Stochastic resonance in machine learning. (Under Review)
- M1. **L.-W. Kong**, Y. Weng, B. Glaz, M Haile, and Y.-C. Lai. Digital Twins of nonlinear dynamical systems. (Under Review)

Papers in Preparation

- P3. **L.-W. Kong**, J. Jiang, and Y.-C. Lai. Dynamics of machine-learning based long-term memory.
- P2. **L.-W. Kong**, W. Shi, X.-J. Tian, and Y.-C. Lai. Growth feedback and gene network topologies: failure mechanisms and scaling law.
- P1. **L.-W. Kong**, and Y.-C. Lai. Machine learning predictions of tipping points with noisy data.

Skills

- Programming languages/analysis software: Matlab, Python, C, Mathematica, MySQL, Tensorflow, Keras, LaTeX.
- Reservoir computing, time series forecasting, machine learning (RNN, VAE, GNN), bifurcation analysis, synchronization on complex networks, percolation on complex networks.

Honors and Awards

University Graduate Fellowship, ASU (\$9,000)	2022
University Graduate Fellowship for New Students, ASU (\$500)	2017

Teaching and Student Supervision

- 2019-2022 Co-Advisor of Two Undergraduate Research Projects
- Part of results published in *Physical Review Applied* [J8], with several media coverages
- Fall 2017 & Spring 2018 PHY 122: University Physics Laboratory I
- Teaching assistant for three undergraduate weekly lab sessions for each semester
 - Includes 30 min lecturing for each session, instructing physics experiments, grading of lab reports, and office hours

Service

Journal Reviewer: Physical Review E; Physical Review Research; SIAM Journal on Applied Dynamical Systems; Chaos, Solitons and Fractals.

Media Coverage

- Machine learning prediction of critical transition and system collapse [J3]:
[Quanta Magazine \(Sept. 2022\): Chaos Researchers Can Now Predict Perilous Points of No Return](#)
- Synchronous transition in complex object control [J8]:
[Forbes \(Sept. 2021\): The Mind-Bending Physics Of Walking With Coffee May Save Humanity, For Now](#)
[The Science Times \(Sept. 2021\): Physics Behind Walking With Cup of Coffee on Hand Without Spillage; Can It Be Applied to Soft Robotics?](#)
[Popular Mechanics \(Sept. 2021\): The Surprisingly Complicated Physics of Carrying a Cup of Coffee — Without Spilling](#)
[Physics World \(Sept. 2021\): Physics explains why humans can walk through crowded places and not spill their coffee](#)
More reports at [EurekAlert! \(AAAS\)](#), [Food & Wine](#), [PHYS.ORG](#), [ASU News](#), and [News Wise](#).
- Synchronization, transients and intermittency in ecological networks [J9]:
[EurekAlert! \(AAAS\) \(Dec. 2020\): Transients and synchronization are unified in ecological networks](#)
also at [PHYS.ORG](#)