Laigang Guo

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Personal Statement

I am an assistant professor at Beijing Normal University in Beijing, China since Sept. 2021. I was previously a postdoctoral fellow working with Prof. Xiao-Shan Gao at AMSS-CAS from Jul. 2019 to Sept. 2021, and also jointly worked with Prof. Raymond W. Yeung at INC-CUHK from Mar. 2021 to Sept. 2021. I received my doctor's degree of applied mathematics under the supervision of Prof. Yufu Chen at UCAS and Prof. Pei Yu at UWO in Jul. 2019.

My research interests are symbolic computation and its applications in inofrmation theory, nonlinear systems, bifurcation theory. Currently, I am focusing on the applications of symbolic computation in proving information theoretic inequalities and identities.

Education

2016.12–2018.1   **Joint Ph.D Student**, Western University, Advisor: Pei Yu.

2014.9–2019.6   **Ph.D**, University of Chinese Academy of Science, Advisor: Yufu Chen.

2010.9–2014.6   **Bachelor**, Shandong Normal University.

Work Experience

2019.7–2021.9   **Postdoctral Fellow**, Academy of Mathematics and Systems Science, CAS.
joint with Prof. Xiao-Shan Gao

2021.9–Now   **Assistant Professor**, Beijing Normal University.

2021.3–2021.9   **Visiting Postdoctral Fellow**, Institute of Network Coding, CUHK.
joint with Prof. Raymond W. Yeung

2022.12–2023.2   **Visiting Postdoctral Fellow**, Institute of Network Coding, CUHK.
joint with Prof. Raymond W. Yeung

2023.6–2023.9   **Visiting Postdoctral Fellow**, Institute of Network Coding, CUHK.
joint with Prof. Raymond W. Yeung

2024.1–2024.8 **Visiting Postdoctral Fellow**, Institute of Network Coding, CUHK.

joint with Prof. Raymond W. Yeung

Talks

2022 **IEEE International Symposium on Information Theory (ISIT)**, *Espoo, Finland.*

2021 **IEEE International Symposium on Information Theory (ISIT)**, *Melbourne, Australia.*

Publications

[1] **Laigang Guo**, Raymond W. Yeung (C), Xiao-Shan Gao. *Proving Information Inequalities and Identities with Symbolic Computation.* IEEE Transactions on Information Theory, 2023.

[2] Xiangyu Wang, **Laigang Guo** (C). *Limit cycles in a switching Liénard system.* Discrete and Continuous Dynamical Systems-B, 2023.

[3] **Laigang Guo**, Chun-Ming Yuan, Xiao-Shan Gao (C). *Lower Bounds on Multivariate Higher Order Derivatives of Differential Entropy.* Entropy, 2022.

[4] **Laigang Guo**, Raymond W. Yeung, Xiao-Shan Gao. *Proving Information Inequalities and Identities with Symbolic Computation.* IEEE International Symposium on Information Theory (ISIT), 2022.

[5] Xiangyu Wang, Yusen Wu, **Laigang Guo** (C). *Bifurcation Analysis for a Class of Cubic Switching Systems.* International Journal of Bifurcation and Chaos, 2022.

[6] **Laigang Guo**, Chun-Ming Yuan, Xiao-Shan Gao. *Lower Bound for Derivatives of Costa's Differential Entropy.* IEEE International Symposium on Information Theory (ISIT), 2021.

[7] **Laigang Guo**, Chun-Ming Yuan, Xiao-Shan Gao (C). *A Generalization of the Concavity of Rényi Entropy Power.* Entropy, 2021.

[8] **Laigang Guo**, Pei Yu (C), Yufu Chen. *Identifying weak focus and center in a convection model.* Applied Mathematics Letters, 2020.

[9] Yusen Wu (C), **Laigang Guo**. *Rough center in a 3-dimensional Lotka-Volterra system.* International Journal of Dynamical Systems and Differential Equations, 2020.

[10] **Laigang Guo**, Pei Yu (C), Yufu Chen. *Bifurcation analysis on a class of Z_2-equivariant cubic switching systems showing eighteen limit cycles.* Journal of Differential Equations, 2019.

[11] **Laigang Guo**, Pei Yu (C), Yufu Chen. *Bifurcation analysis on a class of three-dimensional quadratic systems with twelve limit cycles.* Applied Mathematics and Computation, 2019.

[12] **Laigang Guo**, Yufu Chen (C). *System stability analysis via a perturbation technique.* Communications in Nonlinear Science and Numerical Simulation, 2018.

[13] **Laigang Guo**, Pei Yu (C), Yufu Chen. *Twelve limit cycles in 3-D quadratic vector fields with Z_3 symmetry.* International Journal of Bifurcation and Chaos, 2018.

[14] Yusen Wu, **Laigang Guo** (C), Yufu Chen. *Hopf Bifurcation of Z_2-Equivariant Generalized Liénard Systems.* International Journal of Bifurcation and Chaos, 2018.

[15] **Laigang Guo**, Yufu Chen (C). *Study on stability of systems with forced term.* Journal of University of Chinese Academy of Sciences, 2017.

Projects

2024-2026 **Young Scientists Fund of the National Natural Science Foundation of China**, Project Director.

2021-2023 **Young Teachers' Fund Project of BNU**, Project Director.

2019-2021 **China Postdoctoral Science Foundation (General funding)**, Project Director.

2019-2021 **China Postdoctoral Science Foundation (Special funding)**, Project Director.

Awards

2019 **Beijing Excellent Graduates**.

2019 **Outstanding graduates of Chinese Academy of Sciences**.

2019 **President award of Chinese Academy of Sciences**.

2018 **National scholarship for doctoral students**.