

Curriculum Vitae

Personal Information

Full Name: Zhuchun Li
Nationality: China
Time/Place of Birth: Jan. 1984; Hunan, China
Affiliation/Postal Address: Department of Mathematics, Harbin Institute of Technology,
Harbin 150001, P. R. China
Email Address: lizhuchun@hit.edu.cn
Research areas: Applied dynamical systems on networks,
Flocking, Coupled oscillators and applications

Education

Sep. 2005-Jan. 2011: Ph.D in Mathematics
Department of Mathematics, Harbin Institute of Technology
Supervisor: Prof. Xiaoping Xue
Sep. 2001-Jul. 2005: Bachelor in Mathematics
Department of Mathematics, Harbin Institute of Technology

Appointment/Affiliation

Jan. 2015-Current: Associate Professor
Department of Mathematics, Harbin Institute of Technology
Mar. 2011-Dec. 2014: Assistant Professor
Department of Mathematics, Harbin Institute of Technology
Sep. 2011-Aug. 2013: Post-Doctoral fellow
Department of Mathematical Science, Seoul National University
Mentor: Prof. Seung-Yeal Ha

Publications

- [1] Zhuchun Li, and Xiaoping Xue. Cucker-Smale Flocking under Rooted Leadership with Fixed and Switching Topologies. **SIAM Journal on Applied Mathematics**, 2010, 70(8): 3156-3174.
- [2] Xiaoping Xue, and Zhuchun Li. Asymptotic Stability Analysis of A Kind of Switched Positive Linear Discrete Systems. **IEEE Transactions on Automatic Control**, 2010, 55(9): 2198-2203.
- [3] Zhuchun Li, and Xiaoping Xue. Outer Synchronization of Coupled Networks Using Arbitrary Coupling Strength. **Chaos**, 2010, 20(2): 023106.
- [4] Seung-Yeal Ha, Zhuchun Li, and Xiaoping Xue. Formation of phase-locked states in a population of locally interacting Kuramoto oscillators. **Journal of Differential Equations**, 2013, 255: 3053-3070.
- [5] Zhuchun Li, Seung-Yeal Ha, and Xiaoping Xue. Emergent phenomena in an ensemble of Cucker-Smale particles under joint rooted leadership. **Mathematical Models and Methods in Applied Sciences**, 2014, 24(7): 1389-1419.
- [6] Seung-Yeal Ha, Yongduck Kim, and Zhuchun Li. Large-time dynamics of Kuramoto oscillators under the effect of inertia and frustration. **SIAM Journal on Applied Dynamical Systems**, 2014, 13(1): 466-492.
- [7] Zhuchun Li, Xiaoping Xue, and Daren Yu. Synchronization and transient stability in power grids based on Lojasiewicz inequalities. **SIAM Journal on Control and Optimization**, 2014, 52(4): 2482-2511.

- [8] Zhuchun Li. Effectual leadership in flocks with hierarchy and individual preference. **Discrete and Continuous Dynamical Systems-A**, 2014, 34: 3683-3702.
- [9] Seung-Yeal Ha, and Zhuchun Li. Complete synchronization of Kuramoto oscillators with hierarchical leadership. **Communications in Mathematical Science**, 2014, 12(3): 485-508.
- [10] Young-Pil Choi, Zhuchun Li, Seung-Yeal Ha, Xiaoping Xue, and Seok-Bae Yun. Complete entrainment of Kuramoto oscillators with inertia on networks. **Journal of Differential Equations**, 2014, 257: 2591-2621.
- [11] Zhuchun Li, and Xiaoping Xue. Cucker-Smale flocking under rooted leadership with free-will agents. **Physica A**, 2014, 410: 205-217.
- [12] Zhuchun Li, Xiaoping Xue, and Seung-Yeal Ha. A revisit to the consensus for linearized Vicsek model under joint rooted leadership via a special matrix. **Networks and Heterogeneous Media**, 2014, 9: 335-351.
- [13] Seung-Yeal Ha, Yongduck Kim, and Zhuchun Li. Asymptotic synchronous behavior of Kuramoto type models with frustrations. **Networks and Heterogeneous Media**, 2014, 9: 33-64.
- [14] Seung-Yeal Ha, Zhuchun Li, Marshall Slemrod, and Xiaoping Xue. Flocking behavior of the Cucker-Smale model under rooted leadership in a large coupling limit. **Quarterly of Applied Mathematics**, 2014, 72(4): 689-701.
- [15] Zhuchun Li, Xiaoping Xue, and Daren Yu. On the Lojasiewicz exponent of Kuramoto model. **Journal of Mathematical Physics**, 2015, 56(2): 022704:1-20.
- [16] Lining Ru, Zhuchun Li, and Xiaoping Xue. Cucker-Smale flocking with randomly failed interactions. **Journal of the Franklin Institute**, 2015, 352(3): 1099-1118.
- [17] Zhuchun Li, and Seung-Yeal Ha. On the Cucker-Smale flocking with alternating leaders, **Quarterly of Applied Mathematics**, 2015, 73: 693-709.
- [18] Zhuchun Li, and Seung-Yeal Ha. Uniqueness and well-ordering of emergent phase-locked states for the Kuramoto model with frustration and inertia. **Mathematical Models and Methods in Applied Sciences**, 2016, 26(2): 357-382.
- [19] Seung-Yeal Ha, Jaeseung Lee, and Zhuchun Li. Emergence of local synchronization in an ensemble of heterogeneous Kuramoto oscillators. **Networks and Heterogeneous Media**, 2017, 12(1): 1-24.
- [20] Young-Pil Choi, Seung-Yeal Ha, and Zhuchun Li. Emergent dynamics of the Cucker-Smale flocking model and its variants. **Active Particles, Volume 1: Theory, Models, Applications**, Birkhauser-Springer (Boston) book.

Talks

1. Dec. 3, 2012. Presented an invited talk “Synchronization of dynamical systems on networks: Cucker-Smale and Kuramoto models” in Workshop on International Conference for Nonlinear Dynamics and Complex Systems, National Institute for Mathematical Sciences, Daejeon, Korea.
2. Dec. 7, 2012. Presented an invited talk “Synchronization of dynamic systems on networks: Cucker-Smale and Kuramoto models” in the annual meeting of PARC-SNU (PDE and Functional Analysis Research Center, Seoul National University), Seoul.
3. Jan. 11, 2013. Presented an invited talk “Multi-particle dynamic systems with leadership” in PARC-Sinica joint workshop, SNU-PARC, Seoul.
4. Jun. 3, 2014. Presented a talk “On the Flocking with Leader-Follower Interactions” in the 8th International Conference on Recent Advances in Applied Dynamical Systems, Guilin University of Electronic Technology, Guilin.
5. Jun. 29, 2014. Presented a talk “Gradient inequality for Kuramoto model with applications in power grids” in the 6th Shanghai International Symposium on Nonlinear Sciences and Applications, Fudan University, Shanghai.
6. Jul. 4, 2014. Presented a talk “Flocking of hierarchical Cucker-Smale model with individual preference” in the 8th Chinese conference on qualitative theory of differential equations, Shandong University at Weihai, Weihai.
7. Aug. 13-21, 2014. Presented a short communication “Lojasiewicz exponent of Kuramoto model and applications” in the International Congress of Mathematics (ICM 2014), Seoul.
8. Nov. 21-23, 2014. Presented a talk “Lojasiewicz inequalities and synchronization of Kuramoto model with applications in power grids” in the DLUT-HIT joint workshop in mathematics, Dalian.
9. Jan. 5-9, 2015. Presented an invited talk “On the Lojasiewicz exponent of Kuramoto model” in the Workshop on Frontier Mathematical Problems in Network Science and Data Geometry, Sanya.
10. May. 5, 2015. Presented an invited talk “Cucker-Smale flocking with non-symmetric interactions” in the Department of Mathematics, National University of Defense Technology, Changsha.
11. July. 17-18, 2015. Presented a talk “Lojasiewicz inequality and Lojasiewicz exponent of Kuramoto model with applications” in the 10th Chinese conference on stability theory and applications, Shenyang Normal University, Shenyang.
12. Oct. 20-23, 2016. Presented an invited talk “Synchronization of Coupled Oscillators with Applications in Power Grids” in the International Conference on Big Data and Information Analytics 2016 (BigDIA 2016), National University of Defense Technology, Changsha.

13. Dec. 11-24, 2016. Presented an invited talk “Cucker-Smale flocking with leadership” in the CMC Winter School on Applied Math and Math physics, Korean Institute of Advanced studies, Seoul.
14. Jun. 9-11, 2017. Presented a talk “Region of attraction of synchronization in swing equations” in the 11th International Conference on Recent Advances in Applied Dynamical Systems, Xi’an Jiaotong University, Xi’an.
15. Aug. 18-20, 2017. Presented a talk “Synchronization of Kuramoto oscillators with frustrations and applications” in the 11th Chinese conference on stability theory and applications, Weifang University, Weifang.
16. Aug. 21-24, 2017. Presented an invited talk “Synchronization of Kuramoto type Oscillators with Applications in Power Grids” in the CMC conference: Nonlinear dynamics of many-body systems and related topics, Korean Institute of Advanced Study, Seoul.
17. Aug. 28, 2017. Presented an invited talk “On the Kuramoto oscillators bidirectionally coupled in a ring” in Department of mathematical Sciences, Seoul National University, Seoul.