Zhicheng ZHANG — CV

Department of Electrical Engineering
Chair of Advanced Electrical Systems Theory, Kyoto University
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"There is nothing certain, but the uncertain." – *Proverb*

Z. Zhang is currently a Postdoctoral Researcher at Department of Electrical Engineering, Kyoto University, Katsura, Japan. His research interests include *Sparse Modeling*, *Data-Driven Robust Optimization*, *Nonlinear Dynamics*, *Control Theory and its Applications*. He is a student member of IEEE, SIAM and INFORMS.

Position and Experience

Kyoto University — Kyoto, Japan
2024.04 – present
- Postdoctoral Researcher, Department of EE
- Fields: Koopman Operator Theory for Weather Control
- Supervisor: Prof. Yoshihiko Susuki

The University of Kitakyushu — Fukuoka, Japan
2019.09 – 2020.09
- Visiting Scholar (Master Student), EECS
- Fields: Sparse Modeling and Optimal Control
- Supervisor: Prof. Masaaki Nagahara

Education

Osaka University — Osaka, Japan
2020.10 – 2024.03
- Ph.D, Informatics
- Fields: Probabilistic Robustness for Sparse Control
- Advisor: Prof. Yasumasa Fujisaki

Guilin University of Electronic and Technology — Guilin, China
2017.09 – 2020.06
- M.S., Mathematics
- Fields: ODEs and Dynamical Systems
- Advisor: Prof. Zhongjun Ma

Changzhou Institute of Technology — Changzhou, China
2013.09 – 2017.06
- B.A., Japanese (Major)
- B.S., Applied Mathematics (Minor)

Research Interests

- Decision Making under Uncertainty
  - ♣ Data-Driven Robust Optimization ♣ Stochastic Programming
- Sparse Modeling
  - ♣ Sparse Optimal Control ♣ Sparsity-Promoting Methods
- Networked Control
  - ♣ Nonlinear Multi-Agent Systems ♣ Time-delays in Networks

Honors and Awards

- 2020 Guangxi Outstanding Graduates, China, 2020 (top 1%)

- Outstanding Master's Thesis of GUET, China, 2020 (top 3%)
- Postgraduate Scholarship, First Prize, GUET, China, 2019, 2020 (top 3%)
- Graduate Fellowship for Study Abroad, GUET, China, 2019
- National Scholarship for Master's Student, China, 2019 (top 3%)

Research Projects and Academic Foundations

Practical Stability of Nonlinear Dynamical Systems
Collaborator, *School of Mathematics and Computing Science, GUET* *2017.10 – 2018.06*
- The Innovation Project of GUET Graduate Education, Grant No. 2017YJCX79 (CNY 10,000)

Stability of Impulsive Ordinary Differential Equations and its Applications
Co-Investigator (*CI*), *School of Mathematics and Computing Science, GUET* *2018.10 – 2019.06*
- The Innovation Project of GUET Graduate Education, Grant No. 2018YJCX60 (CNY 10,000)

Intermittent Feedback Control of Nonlinear Multi-Agent Systems
Principal Investigator (*PI*), *School of Mathematics and Computing Science, GUET* *2018.12 – 2020.06*
- Cultivation of Excellent Thesis Project of GUET Graduate Education, Grant No. 2018YJSPY01 (CNY 10,000)

Cooperative Control of Multi-Agent Networked Systems
Principal Investigator (*PI*), *School of Mathematics and Computing Science, GUET* *2019.09 – 2020.08*
- The Study Abroad Program for Graduate Student of GUET, Grant No. GDYX2019015 (JPY 1,800,000)

Partial Component Synchronization of Nonlinear Networks and its Applications
Collaborator, *School of Mathematics and Computing Science, GUET* *2019.01 – 2021.12*
- Guangxi Natural Science Foundation, China, Grant No. 2018GXNSFAA281068 (CNY 50,000)

Positions of Responsibility

- **Teaching Assistant** for Undergraduate courses like *Mathematical Analysis*, *Advanced Algebra*, and *Calculus*.
- **Teaching Assistant** for Graduate courses like *operations research*, and *research seminars*.

Professional Service

Reviewer (Journals & Conferences)

- International Journal of Robust and Nonlinear Control (IJRNC)
- IEEE Transactions on Systems, Man and Cybernetics (IEEE TSMC)
- IFAC Symposium on Robust Control Design (ROCOND 2022)
- IFAC World Congress (2023)
- European Control Conference (ECC 2024)
- IEEE Int. Conf. Advanced Robotics and Mechatronics (ICARM 2024)

Publications

Peer Review Journals

[J2] Z. Zhang and Y. Fujisaki, "Sparse feedback controller: From open-loop solution to closed-loop realization," *SICE Journal of Control, Measurement, and System Integration*, 2023, Vol.. 16, No. 1, 286–296. arXiv.2303.15175
Doi: 10.1080/18824889.2023.2237234.

[J1] Z. Zhang, Z. Ma and Y. Wang, "Partial component consensus of leader-following multi-agent systems via intermittent pinning control," *Physica A: Statistical Mechanics and its Applications*, 2019,

536: 122569.
Doi: 10.1016/j.physa.2019.122569.

Proceeding Conferences

[C6] Z. Zhang and Y. Fujisaki, "Data-driven sparse feedback control with Schur-α stability," *SICE International Symposium on Control System* (*ISCS'24*), Hiroshima, Mar., 2024.

[C5] Z. Zhang and Y. Fujisaki, "Risk assessment for sparse optimization with relaxation," *The 55th ISCIE International Symposium on Stochastic System Theory and Its Applications* (*SSS'23*), Tokyo, Nov., 2023, p.4A3.

[C4] Z. Zhang and Y. Fujisaki, "Risk-aware sparse predictive control", *Preprint of the 22nd IFAC Word Congress*, Yokohama, Jul., 2023, pp. 1477-1480.

[C3] Z. Zhang and Y. Fujisaki, "Sparse feedback control realization using linear dynamic compensator," *SICE International Symposium on Control System* (*ISCS'23*), Kusatsu, Mar. 2023, p. 3M1.4.

[C2] Z. Zhang and Y. Fujisaki, "Sparse robust control design via scenario optimization", *Proceeding ISCIE International Symposium on Stochastic System Theory and Its Applications* (*SSS'21*), Kusatsu, Oct., 2022, pp. 61-64.

[C1] Z. Zhang and M. Nagahara, "Linear quadratic tracking control with sparsity-promoting regularization," *2021 American Control Conference* (*ACC'21*), IEEE, May 2021. pp. 3812–3817.

Preprints

[P2] Z. Zhang, Z. Ma, Y. Wang and K. Li, "Wait-and-track characteristics for a generic multiagent system under control input attacks," Submitted to *IEEE Trans. Control of Network Systems*, 2023.

[P1] Z. Zhang and Z. Ma, "Lag synchronization for large-scale complex networks under stochastic input disturbances," *Chaos: An Interdisciplinary Journal of Nonlinear Science*. 2023, (under review)

Thesis

[T1] Master's Thesis: Consensus of Classes of Nonlinear Multi-agent Network Systems via Intermittent Control, *China National Knowledge Infrastructure* (*CNKI*), June, 2020 (in Chinese)

[T2] Ph.D. Thesis: Modeling, Robustness and Stability for Sparse Optimal Control of Dynamical Systems, Osaka University, March, 2024.

Technical Strengths

- **Languages:** Chinese (native), Japanese (N2), and English (fluent).
- **Skills:** LaTeX, Matlab, Python, Julia

Personal Information

- Born in Dec. 1994, in Jiangsu Province, China
- ⊛ Citizenship: Chinese

References

- **Yasumasa Fujisaki**
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  Osaka University
  fujisaki@ist.osaka-u.ac.jp

- **Zhongjun Ma**
  School of Mathematics and Computing Science
  Guilin University of Electronic and Technology
  mazhongjun@guet.edu.cn

- **Masaaki Nagahara**
  Graduate School of Advanced Science and Engineering
  Hiroshima University
  nagam@hiroshima-u.ac.jp