

杨国松

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研究方向

切换系统和混合系统 (switched and hybrid systems)、网络化控制系统 (networked control systems) 和博弈学习 (learning in games), 及其在网络实体系统 (cyber-physical systems, CPS) 和网络安全 (network security) 中的应用。

工作经历

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| 加利福尼亚大学圣巴巴拉分校, 美国
博士后, 控制、动态系统和运算中心
导师: João P. Hespanha 教授 | 2017 年 8 月–现在 |
| 加利福尼亚大学圣巴巴拉分校, 美国
访问学者, 电子与计算机工程学系
导师: João P. Hespanha 教授 | 2017 年 5 月–2017 年 7 月 |

教育背景

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| 伊利诺伊大学厄巴纳-尚佩恩分校, 美国
博士 (电子与计算机工程学)
毕业论文: “Switched and hybrid systems with inputs: Small-gain theorems, control with limited information, and topological entropy”
导师: Daniel Liberzon 教授 | 2013 年 10 月–2017 年 8 月 |
| 伊利诺伊大学厄巴纳-尚佩恩分校, 美国
硕士 (电子与计算机工程学)
毕业论文: “A Lyapunov-based small-gain theorem for interconnected switched systems”
导师: Daniel Liberzon 教授 | 2011 年 8 月–2013 年 8 月 |
| 香港科技大学, 中国香港
学士 (电子工程学, 辅修数学)
导师: 李泽湘教授 | 2007 年 9 月–2011 年 6 月 |

奖项与荣誉

- *ACM SIGBED HSCC Best Paper Award* at the 22nd ACM International Conference on Hybrid Systems: Computation and Control, 2019

- *Best Poster Award* at the 11th Coordinated Science Laboratory Student Conference, University of Illinois at Urbana-Champaign, 2016
- *Graduate College Conference Travel Award*, University of Illinois at Urbana-Champaign, 2016
- *University Scholarship, School of Engineering Scholarship, ECE Outstanding Freshmen Scholarship, The Joseph Lau Luen Hung Charitable Trust Scholarship*, Hong Kong University of Science and Technology, 2007–2011
- *Gold medal*, 8th Asian Physics Olympiad, 2007

学术成果

工作论文

1. H. Ferraz, G. Yang, and J. P. Hespanha, “Distributed leader-follower model predictive control.”
2. G. Yang, D. Liberzon, and J. P. Hespanha, “Topological entropy of nonlinear switched and time-varying systems.”
3. G. Yang, R. Poovendran, and J. P. Hespanha, “Adaptive learning in two-player Stackelberg games with application to network security.”

期刊论文

1. G. Yang, A. J. Schmidt, D. Liberzon, and J. P. Hespanha, “Topological entropy of switched linear systems: General matrices and matrices with commutation relations,” *Mathematics of Control, Signals, and Systems*, vol. 32, no. 3, pp. 411–453, Sep. 2020 (中科院分区: 工程技术 4 区; 自动化与控制系统 4 区、工程: 电子与电气 4 区、数学跨学科应用 4 区)
2. G. Yang and D. Liberzon, “Feedback stabilization of a switched linear system with an unknown disturbance under data-rate constraints,” *IEEE Transactions on Automatic Control*, vol. 63, no. 7, pp. 2107–2122, Jul. 2018 (中科院分区: 工程技术 2 区; 自动化与控制系统 2 区、工程: 电子与电气 2 区)
3. K. Okano, M. Wakaiki, G. Yang, and J. P. Hespanha, “Stabilization of networked control systems under clock offsets and quantization,” *IEEE Transactions on Automatic Control*, vol. 63, no. 6, pp. 1708–1723, Jun. 2018 (中科院分区: 工程技术 2 区; 自动化与控制系统 2 区、工程: 电子与电气 2 区)
4. A. Mironchenko, G. Yang, and D. Liberzon, “Lyapunov small-gain theorems for networks of not necessarily ISS hybrid systems,” *Automatica*, vol. 88, pp. 10–20, Feb. 2018 (中科院分区: 工程技术 1 区; 自动化与控制系统 1 区、工程: 电子与电气 2 区)
5. G. Yang and D. Liberzon, “A Lyapunov-based small-gain theorem for interconnected switched systems,” *Systems & Control Letters*, vol. 78, pp. 47–54, Apr. 2015 (中科院分区: 工程技术 3 区; 自动化与控制系统 3 区、工程: 电子与电气 3 区)

书籍章节

1. G. Yang and J. P. Hespanha, “Modeling and mitigating link-flooding distributed denial-of-service attacks via learning in Stackelberg games,” in *Handbook of Reinforcement Learning and Control*, K. G. Vamvoudakis, Y. Wan, F. L. Lewis, and D. Cansever, Eds. Springer, to be published

会议论文

1. G. Yang, R. Poovendran, and J. P. Hespanha, “Adaptive learning in two-player Stackelberg games with continuous action sets,” in *58th IEEE Conference on Decision and Control*, 2019, pp. 6905–6911
2. G. Yang, J. P. Hespanha, and D. Liberzon, “On topological entropy and stability of switched linear systems,” in *22nd ACM International Conference on Hybrid Systems: Computation and Control*, 2019, pp. 119–127 (**Best Paper Award winner**)
3. G. Yang and J. P. Hespanha, “On topological entropy of switched linear systems with pairwise commuting matrices,” in *56th Annual Allerton Conference on Communication, Control, and Computing*, 2018, pp. 429–436 (invited paper)
4. G. Yang, A. J. Schmidt, and D. Liberzon, “On topological entropy of switched linear systems with diagonal, triangular, and general matrices,” in *57th IEEE Conference on Decision and Control*, 2018, pp. 5682–5687
5. G. Yang, H. Hosseini, D. Sahabandu, A. Clark, J. P. Hespanha, and R. Poovendran, “Modeling and mitigating the Coremelt attack,” in *2018 American Control Conference*, 2018, pp. 3410–3416
6. G. Yang, D. Liberzon, and Z.-P. Jiang, “Stabilization of interconnected switched control-affine systems via a Lyapunov-based small-gain approach,” in *2017 American Control Conference*, 2017, pp. 5182–5187
7. G. Yang, D. Liberzon, and A. Mironchenko, “Analysis of different Lyapunov function constructions for interconnected hybrid systems,” in *55th IEEE Conference on Decision and Control*, 2016, pp. 465–470 (invited paper)
8. G. Yang and D. Liberzon, “Finite data-rate stabilization of a switched linear system with unknown disturbance,” in *10th IFAC Symposium on Nonlinear Control Systems*, vol. 49, no. 18, 2016, pp. 1085–1090
9. G. Yang and D. Liberzon, “Stabilizing a switched linear system with disturbance by sampled-data quantized feedback,” in *2015 American Control Conference*, 2015, pp. 2193–2198
10. G. Yang and D. Liberzon, “Input-to-state stability for switched systems with unstable subsystems: A hybrid Lyapunov construction,” in *53rd IEEE Conference on Decision and Control*, 2014, pp. 6240–6245
11. A. Mironchenko, G. Yang, and D. Liberzon, “Lyapunov small-gain theorems for not necessarily ISS hybrid systems,” in *21st International Symposium on Mathematical Theory of Networks and Systems*, 2014, pp. 1001–1008

科研项目申报经历

- Coauthor of the National Science Foundation grant [CMMI-1662708](#): “Switched Control Systems with Limited Information: An Entropy Approach to Stabilization and Disturbance Attenuation” (Program: Dynamics, Control and Systems Diagnostics), PI: Daniel Liberzon, 2017–2020, Award: \$349,540 (依托单位: 伊利诺伊大学厄巴纳-尚佩恩分校)

科研项目参与经历

- National Science Foundation grant [ECCS-2029985](#): “RAPID: Informed Decision Making for Pandemic Management” (Program: COVID-19 Research), PI: João P. Hespanha, 2020–2021, Award: \$146,274 (依托单位: 加利福尼亚大学圣巴巴拉分校)

- National Science Foundation grant [EPCN-1608880](#): “Online Optimization for the Control of Small Autonomous Vehicles” (Program: Energy, Power, Control, and Networks), PI: João P. Hespanha, 2016–2021, Award: \$359,838 (依托单位: 加利福尼亚大学圣巴巴拉分校)
- Office of Naval Research grant [N00014-16-1-2710](#): “ADAPT: Analytical Framework for Actionable Defense against Advanced Persistent Threats” (Program: Multidisciplinary University Research Initiatives), Leading PI: Radha Poovendran, PI: João P. Hespanha, 2016–2021 (依托单位: 加利福尼亚大学圣巴巴拉分校)
- National Science Foundation grant [CNS-1329650](#): “ROSELIN: Enabling Robust, Secure, and Efficient Knowledge of Time Across the System Stack” (Program: Cyber Physical Systems), PI: João P. Hespanha, 2014–2020, Award: \$544,726 (依托单位: 加利福尼亚大学圣巴巴拉分校)
- National Science Foundation grant [CMMI-1662708](#): “Switched Control Systems with Limited Information: An Entropy Approach to Stabilization and Disturbance Attenuation” (Program: Dynamics, Control and Systems Diagnostics), PI: Daniel Liberzon, 2017–2020, Award: \$349,540 (依托单位: 伊利诺伊大学厄巴纳-尚佩恩分校)
- National Science Foundation grant [ECCS-1231196](#): “Hybrid Small-gain Theorems for Nonlinear Networked and Quantized Control Systems” (Program: Energy, Power, Control, and Networks), PI: Daniel Liberzon, 2012–2016, Award: \$240,000 (依托单位: 伊利诺伊大学厄巴纳-尚佩恩分校)
- National Science Foundation grant [CNS-1217811](#): “Limited-Information Control of Hybrid Systems via Reachable Set Propagation” (Program: Computer Systems Research), PI: Daniel Liberzon, 2012–2016, Award: \$280,000 (依托单位: 伊利诺伊大学厄巴纳-尚佩恩分校)

会议报告、组织与特邀报告

- 会议报告: [37th Southern California Control Workshop](#), University of California, San Diego, CA, USA, Jan. 2020
- 会议报告: [22nd ACM International Conference on Hybrid Systems: Computation and Control \(HSCC 2019\)](#), Montreal, Canada, Apr. 2019 (Best Paper Award winner)
- 会议报告: [57th IEEE Conference on Decision and Control \(CDC 2018\)](#), Miami Beach, FL, USA, Dec. 2018
- 会议分会主席: Session on “Switched Systems” at the [57th IEEE Conference on Decision and Control](#), Miami Beach, FL, USA, Dec. 2018
- 会议报告: [35th Southern California Control Workshop](#), University of California, Los Angeles, CA, USA, Nov. 2018
- 会议报告: [56th Annual Allerton Conference on Communication, Control, and Computing \(Allerton 2018\)](#), Monticello, IL, USA, Oct. 2018
- 会议报告: [2018 American Control Conference \(ACC 2018\)](#), Milwaukee, WI, USA, Jun. 2018
- 会议报告: [2017 American Control Conference \(ACC 2017\)](#), Seattle, WA, USA, May 2017
- 特邀报告: [Multi-Agent Robotics Lab](#), University of California, San Diego, CA, USA, Mar. 2017 (Host: Jorge Cortés and Sonia Martínez)
- 特邀报告: [Hybrid Systems Laboratory](#), University of California, Santa Cruz, CA, USA, Feb. 2017 (Host: Ricardo G. Sanfelice)

- 会议报告: [55th IEEE Conference on Decision and Control \(CDC 2016\)](#), Las Vegas, NV, USA, Dec. 2016
- 特邀报告: [Center for Control, Dynamical Systems, and Computation](#), University of California, Santa Barbara, CA, USA, Nov. 2016 (Host: Andrew R. Teel)
- 特邀报告: [Cyber-Physical Systems Laboratory](#), University of California, Los Angeles, CA, USA, Oct. 2016 (Host: Paulo Tabuada)
- 会议报告: [10th IFAC Symposium on Nonlinear Control Systems \(NOLCOS 2016\)](#), Monterey, CA, USA, Aug. 2016
- 会议海报报告: [11th Coordinated Science Laboratory Student Conference \(CSLSC 2016\)](#), Urbana, IL, USA, Feb. 2016 (Best Poster Award winner)
- 会议报告: [2015 American Control Conference \(ACC 2015\)](#), Chicago, IL, USA, Jul. 2015
- 会议报告: [53rd IEEE Conference on Decision and Control \(CDC 2014\)](#), Los Angeles, CA, USA, Dec. 2014
- 会议报告: [2nd Midwest Workshop on Control and Game Theory](#), University of Notre Dame, Notre Dame, IN, USA, Apr. 2013

教学与学生指导经历

加利福尼亚大学圣巴巴拉分校, 美国

- 本科生科研项目导师: “Remote Tracking of Unmanned Ground Vehicles”
- 高中生科研项目导师: “Motion Planning for Unmanned Ground Vehicles”

伊利诺伊大学厄巴纳-尚佩恩分校, 美国

- 研究生课程助教: “[ECE517 Nonlinear and Adaptive Control](#)” (非线性与自适应控制)
- 研究生课程助教: “[ECE528 Analysis of Nonlinear Systems](#)” (非线性系统分析)

期刊及会议审稿人

期刊审稿人

- [IEEE Transactions on Automatic Control](#)
- [IFAC Automatica](#)
- [System & Control Letters](#)
- [Mathematics of Control, Signals, and Systems](#)
- [Nonlinear Analysis: Hybrid Systems](#)
- [IEEE Control Systems Letters](#)
- [Communications in Nonlinear Science and Numerical Simulation](#)

会议审稿人

- [IEEE Conference on Decision and Control \(2019 and 2020\)](#)
- [IFAC World Congress \(2020\)](#)

- *IFAC Workshop on Distributed Estimation and Control in Networked Systems* ([2019](#))
- *American Control Conference* ([2017](#) and [2018](#))
- *ACM International Conference on Hybrid Systems: Computation and Control* ([2016](#) and [2017](#))
- *IFAC Conference on Modelling, Identification and Control of Nonlinear Systems* ([2015](#))