# 杨国松

Department of Electrical and Computer Engineering
University of California, Santa Barbara
5152 Harold Frank Hall, Santa Barbara, CA 93106 USA
guosongyang@ucsb.edu | +1 (217) 979-8066 | guosong-yang.github.io

## 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），及其在信息物理系统（cyber-physical systems, 简称 CPS）与网络安全（network security）中的应用。

## 工作履历

**加利福尼亚大学圣巴巴拉分校**，美国                                     2017 年 8 月–现在
博士后，控制、动态系统与运算中心
导师：João P. Hespanha

## 教育背景

**伊利诺伊大学厄巴纳-尚佩恩分校**，美国                            2013 年 10 月–2017 年 8 月
博士（电子与计算机工程）
毕业论文："Switched and hybrid systems with inputs: Small-gain theorems, control with limited information, and topological entropy"
导师：Daniel Liberzon

**伊利诺伊大学厄巴纳-尚佩恩分校**，美国                             2011 年 8 月–2013 年 8 月
硕士（电子与计算机工程）
毕业论文："A Lyapunov-based small-gain theorem for interconnected switched systems"
导师：Daniel Liberzon

**香港科技大学**，中国香港                                        2007 年 9 月–2011 年 6 月
学士（电子工程，辅修数学）
导师：李泽湘

## 奖项与荣誉

- 最佳论文奖：*ACM SIGBED HSCC Best Paper Award*，22nd ACM International Conference on Hybrid Systems: Computation and Control，2019

- 最佳海报奖：*Best Poster Award*，11th Coordinated Science Laboratory Student Conference，伊利诺伊大学厄巴纳-尚佩恩分校，2016

- *Graduate College Conference Travel Award*，伊利诺伊大学厄巴纳-尚佩恩分校，2016

- *University Scholarship*、*School of Engineering Scholarship*、*ECE Outstanding Freshmen Scholarship*、*The Joseph Lau Luen Hung Charitable Trust Scholarship*，香港科技大学，2007–2011

- *Gold medal*，8th Asian Physics Olympiad，2007

## 工作论文

1. Henrique Ferraz, Guosong Yang, and João P. Hespanha, "Distributed leader-follower model predictive control."

2. Guosong Yang, Daniel Liberzon, and João P. Hespanha, "Topological entropy of nonlinear switched and time-varying systems."

## 期刊论文

1. Guosong Yang, Radha Poovendran, and João P. Hespanha, "Adaptive learning in two-player Stackelberg games with application to network security," submitted for publication

2. João P. Hespanha, Raphael Chinchilla, Ramon R. Costa, Murat K. Erdal, and Guosong Yang, "Forecasting COVID-19 cases based on a parameter-varying stochastic SIR model," submitted for publication

3. Guosong Yang, A. James Schmidt, Daniel Liberzon, and João 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

4. Guosong Yang and Daniel Liberzon, "Feedback stabilization of switched linear systems with unknown disturbances under data-rate constraints," *IEEE Transactions on Automatic Control*, vol. 63, no. 7, pp. 2107–2122, Jul. 2018

5. Kunihisa Okano, Masashi Wakaiki, Guosong Yang, and João 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

6. Andrii Mironchenko, Guosong Yang, and Daniel Liberzon, "Lyapunov small-gain theorems for networks of not necessarily ISS hybrid systems," *Automatica*, vol. 88, pp. 10–20, Feb. 2018

7. Guosong Yang and Daniel Liberzon, "A Lyapunov-based small-gain theorem for interconnected switched systems," *Systems & Control Letters*, vol. 78, pp. 47–54, Apr. 2015

## 书籍章节

1. Guosong Yang and João P. Hespanha, "Modeling and mitigating link-flooding distributed denial-of-service attacks via learning in Stackelberg games," in *Handbook of Reinforcement Learning and Control*, Kyriakos G. Vamvoudakis, Yan Wan, Frank L. Lewis, and Derya Cansever, Eds. Springer, 2021, to be published

## 会议论文

1. Guosong Yang, Daniel Liberzon, and João P. Hespanha, "Topological entropy of switched nonlinear systems," in *24th ACM International Conference on Hybrid Systems: Computation and Control*, 2021, to be published

2. Guosong Yang, Radha Poovendran, and João 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

3. Guosong Yang, João P. Hespanha, and Daniel 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（**最佳论文奖**）

4. Guosong Yang and João 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（特邀论文）

5. Guosong Yang, A. James Schmidt, and Daniel 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

6. Guosong Yang, Hossein Hosseini, Dinuka Sahabandu, Andrew Clark, João P. Hespanha, and Radha Poovendran, "Modeling and mitigating the Coremelt attack," in *2018 American Control Conference*, 2018, pp. 3410–3416

7. Guosong Yang, Daniel Liberzon, and Zhong-Ping Jiang, "Stabilization of interconnected switched control-affine systems via a Lyapunov-based small-gain approach," in *2017 American Control Conference*, 2017, pp. 5182–5187

8. Guosong Yang, Daniel Liberzon, and Andrii Mironchenko, "Analysis of different Lyapunov function constructions for interconnected hybrid systems," in *55th IEEE Conference on Decision and Control*, 2016, pp. 465–470（特邀论文）

9. Guosong Yang and Daniel 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

10. Guosong Yang and Daniel Liberzon, "Stabilizing a switched linear system with disturbance by sampled-data quantized feedback," in *2015 American Control Conference*, 2015, pp. 2193–2198

11. Guosong Yang and Daniel 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

12. Andrii Mironchenko, Guosong Yang, and Daniel 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

## 科研项目申请经历

- 项目申请撰稿人：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 Initiative), 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: "ROSELINE: 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）

## 特邀报告与会议报告

### 特邀报告

- *Multi-Agent Robotics Lab*, University of California, San Diego, CA, USA, Mar. 2017 (Host: Jorge Cortés and Sonia Martínez)

- *Hybrid Systems Laboratory*, University of California, Santa Cruz, CA, USA, Feb. 2017 (Host: Ricardo G. Sanfelice)

- *Center for Control, Dynamical Systems, and Computation*, University of California, Santa Barbara, CA, USA, Nov. 2016 (Host: Andrew R. Teel)

- *Cyber-Physical Systems Laboratory*, University of California, Los Angeles, CA, USA, Oct. 2016 (Host: Paulo Tabuada)

### 会议报告

- *37th Southern California Control Workshop*, University of California, San Diego, CA, USA, Jan. 2020

- *22nd ACM International Conference on Hybrid Systems: Computation and Control*, Montreal, Canada, Apr. 2019（最佳论文奖）

- *57th IEEE Conference on Decision and Control*, Miami Beach, FL, USA, Dec. 2018

- *35th Southern California Control Workshop*, University of California, Los Angeles, CA, USA, Nov. 2018

- *56th Annual Allerton Conference on Communication, Control, and Computing*, Monticello, IL, USA, Oct. 2018
- *2018 American Control Conference*, Milwaukee, WI, USA, Jun. 2018
- *2017 American Control Conference*, Seattle, WA, USA, May 2017
- *55th IEEE Conference on Decision and Control*, Las Vegas, NV, USA, Dec. 2016
- *10th IFAC Symposium on Nonlinear Control Systems*, Monterey, CA, USA, Aug. 2016
- *11th Coordinated Science Laboratory Student Conference*, University of Illinois at Urbana-Champaign, Urbana, IL, USA, Feb. 2016（最佳海报奖）
- *2015 American Control Conference*, Chicago, IL, USA, Jul. 2015
- *53rd IEEE Conference on Decision and Control*, Los Angeles, CA, USA, Dec. 2014
- *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）

## 审稿与组织经历

**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**
- *American Control Conference* (2017, 2018, and 2021)
- *IEEE Conference on Decision and Control* (2019 and 2020)
- *IFAC World Congress* (2020)

- *IFAC Workshop on Distributed Estimation and Control in Networked Systems* (2019)

- *ACM International Conference on Hybrid Systems: Computation and Control* (2016 and 2017)

- *IFAC Conference on Modelling, Identification and Control of Nonlinear Systems* (2015)

## 会议组织者

- 会议项目委员会成员：Program committees for "Repeatability Evaluation" and "Posters and Demos" for the *24th ACM International Conference on Hybrid Systems: Computation and Control*, May 2021

- 会议分会主席："Switched Systems I" at the *57th IEEE Conference on Decision and Control*, Miami Beach, FL, USA, Dec. 2018