GUOSONG YANG

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

Position

University of California, Santa Barbara, Santa Barbara, CA, USA 2017–present

Postdoctoral Scholar

Center for Control, Dynamical Systems, and Computation

Department of Electrical and Computer Engineering

Advisor: João P. Hespanha

Education

University of Illinois at Urbana-Champaign, Urbana, IL, USA 2013–2017

Ph.D. in Electrical and Computer Engineering

Advisor: Daniel Liberzon

Dissertation: "Switched and hybrid systems with inputs: small-gain theorems, control with limited information, and topological entropy"

University of Illinois at Urbana-Champaign, Urbana, IL, USA 2011–2013

M.S. in Electrical and Computer Engineering

Advisor: Daniel Liberzon

Thesis: "A Lyapunov-based small-gain theorem for interconnected switched systems"

Hong Kong University of Science and Technology, Hong Kong 2007–2011

B.Eng. in Electronic Engineering (Honors Research Option)

Minor in Mathematics

Advisor: Zexiang Li

Awards and honors

- *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

Research interests

- Switched and hybrid systems
- Networked systems
- Control with limited information
- Network security

Publications

Journals

- Guosong Yang, A. James Schmidt, Daniel Liberzon, and João P. Hespanha, "Topological entropy of switched linear systems: General matrices and matrices with commutation relations," submitted for publication
- Guosong Yang and Daniel 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
- 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
- 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
- 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

Conferences

- 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, to be published
- 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 (Best Paper Award winner)
- 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 (invited paper)
- 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
- 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
- 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

- 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 (invited paper)
- 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
- 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
- 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
- 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

Grant-writing experience

- Coauthor of National Science Foundation grant CMMI-1662708: "Switched control systems with limited information: An entropy approach to stabilization and disturbance attenuation," PI: Daniel Liberzon, 2017–2020, Amount: $349,540

Presentations and seminars

- Presentation at the *22nd ACM International Conference on Hybrid Systems: Computation and Control*, Montreal, Canada, Apr. 2019 (Best Paper Award winner)
- Presentation at the *57th IEEE Conference on Decision and Control*, Miami Beach, FL, USA, Dec. 2018
- Presentation at the *35th Southern California Control Workshop*, University of California, Los Angeles, CA, USA, Nov. 2018
- Invited presentation at the *56th Annual Allerton Conference on Communication, Control, and Computing*, Monticello, IL, USA, Oct. 2018
- Presentation at the *2018 American Control Conference*, Milwaukee, WI, USA, Jun. 2018
- Presentation at the *2017 American Control Conference*, Seattle, WA, USA, May. 2017
- Seminar at the *Multi-Agent Robotics Lab*, University of California, San Diego, CA, USA, Mar. 2017
- Seminar at the *Hybrid Systems Laboratory*, University of California, Santa Cruz, CA, USA, Feb. 2017
- Invited presentation at the *55th IEEE Conference on Decision and Control*, Las Vegas, NV, USA, Dec. 2016
- Seminar at the *Center for Control, Dynamical Systems, and Computation*, University of California, Santa Barbara, CA, USA, Nov. 2016
- Seminar at the *Cyber-Physical Systems Laboratory*, University of California, Los Angeles, CA, USA, Oct. 2016

- Presentation at the *10th IFAC Symposium on Nonlinear Control Systems*, Monterey, CA, USA, Aug. 2016
- Poster presentation at the *11th Coordinated Science Laboratory Student Conference*, Urbana, IL, USA, Feb. 2016 (Best Poster Award winner)
- Presentation at the *2015 American Control Conference*, Chicago, IL, USA, Jul. 2015
- Presentation at the *53rd IEEE Conference on Decision and Control*, Los Angeles, CA, USA, Dec. 2014
- Presentation at the *2nd Midwest Workshop on Control and Game Theory*, University of Notre Dame, Notre Dame, IN, USA, Apr. 2013

Teaching

University of Illinois at Urbana-Champaign, Urbana, IL, USA

– Teaching assistant for graduate course "Nonlinear and Adaptive Control (ECE517)"

– Teaching assistant for graduate course "Analysis of Nonlinear Systems (ECE528)"

Service

Journal reviewer

- IEEE Transactions on Automatic Control
- IFAC Automatica
- System & Control Letters
- Nonlinear Analysis: Hybrid Systems
- IEEE Control Systems Letters

Conference reviewer

- IEEE Conference on Decision and Control: CDC 2019
- American Control Conference: ACC 2017 and ACC 2018
- ACM International Conference on Hybrid Systems: Computation and Control: HSCC 2016 and HSCC 2017
- IFAC Conference on Modelling, Identification and Control of Nonlinear Systems: MICNON 2015
- IFAC Workshop on Distributed Estimation and Control in Networked Systems: NecSys 2019