

Masaki Ogura
Curriculum Vitae
Sunday 9th June, 2019

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AREAS OF EXPERTISE

Control theory, network science, optimization, stochastic processes, biological physics

EDUCATION

| | |
|----------|--|
| Aug 2014 | Ph.D. in Mathematics, <i>Texas Tech University</i> |
| Mar 2009 | M.Sc. in Informatics, <i>Kyoto University</i> |
| Mar 2007 | B.Eng., <i>Kyoto University</i> |

PROFESSIONAL APPOINTMENTS

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|---------------------|--|
| Mar 2017 – | <i>Assistant Professor</i> Graduate School of Information Science Nara Institute of Science and Technology |
| Nov 2014 – Feb 2017 | <i>Postdoctoral Researcher</i> Department of Electrical and Systems Engineering University of Pennsylvania |

SHORT TERM VISITS

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| May 2017 | Washington State University, USA |
| Nov 2013 | ICTEAM Institute, Université catholique de Louvain, Belgium |

SELECTED AWARDS AND HONORS

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| Apr 2014 | Summer Dissertation/Thesis Research Award, Texas Tech University |
| Jul 2013 | Cash Family Endowed Fellowship, Texas Tech University |
| Jun 2012 | Best Paper Award, The Society of Instrument and Control Engineers |
| May 2012 | Ronald M. Anderson Scholarship, Texas Tech University |
| May 2011 | Gordon Fuller Mathematics Scholarship, Texas Tech University |

PUBLICATIONS

Book Chapters

- [1] M. Ogura and V. M. Preciado, “Optimal Containment of Epidemics in Temporal and Adaptive Networks,” in *Temporal Networks Epidemiology*. Springer, 2017, pp. 241–266.
- [2] V. M. Preciado, M. Zargham, C. Nowzari, S. Han, M. Ogura, A. Jadbabaie, and G. J. Pappas, “Bio-inspired framework for allocation of protection resources in cyber-physical networks,” in *Principles of Cyber-Physical Systems*. Cambridge University Press, in press, 2015.
- [3] M. Ogura and C. F. Martin, “Linear switching systems and random products of matrices,” in *Mathematical System Theory – Festschrift in Honor of Uwe Helmke on the Occasion of his Sixtieth Birthday*, K. Hüper and J. Trumppf, Eds. CreateSpace, 2013, pp. 291–300.

Refereed Journal Articles

- [1] M. Ogura, W. Mei, and K. Sugimoto, “Synergistic effects in networked epidemic spreading dynamics,” *IEEE Transactions on Circuits and Systems II: Express Briefs* (accepted for publication), 2019.
- [2] M. Ogura and V. M. Preciado, “Stability of SIS spreading processes in networks with non-Markovian transmission and recovery,” *IEEE Transactions on Control of Network Systems* (accepted for publication), 2019.
- [3] M. Ogura, J. Harada, M. Kishida, and A. Yassine, “Resource optimization of product development projects with time-varying dependency structure,” *Research in Engineering Design*, vol. 30, no. 3, pp. 435–452, 2019.
- [4] M. Ogura, V. M. Preciado, and N. Masuda, “Optimal containment of epidemics over temporal activity-driven networks,” *SIAM Journal on Applied Mathematics*, vol. 79, no. 3, pp. 986–1006, 2019.
- [5] W. Mei and M. Ogura, “Kronecker weights for instability analysis of Markov jump linear systems,” *IET Control Theory & Applications*, vol. 13, no. 3, pp. 360–366, 2019.
- [6] M. Wakaiki, M. Ogura, and J. P. Hespanha, “LQ-optimal sampled-data control under stochastic delays: gridding approach for stabilizability and detectability,” *SIAM Journal on Control and Optimization*, vol. 56, no. 4, pp. 2634–2661, 2018.
- [7] M. Ogura, A. Cetinkaya, T. Hayakawa, and V. M. Preciado, “State feedback control of Markov jump linear systems with hidden-Markov mode observation,” *Automatica*, vol. 89, pp. 65–72, 2018.
- [8] M. Ogura and V. M. Preciado, “Second-order moment-closure for tighter epidemic thresholds,” *Systems & Control Letters*, vol. 113, pp. 59–64, 2018.
- [9] M. Ogura and V. M. Preciado, “Optimal design of switched networks of positive linear systems via geometric programming,” *IEEE Transactions on Control of Network Systems*, vol. 4, no. 2, pp. 213–222, 2017.
- [10] M. Ogura, M. Wakaiki, H. Rubin, and V. M. Preciado, “Delayed bet-hedging resilience strategies under environmental fluctuations,” *Physical Review E*, vol. 95, p. 052404, 2017.

- [11] M. Ogura, V. M. Preciado, and R. M. Jungers, “Efficient method for computing lower bounds on the p -radius of switched linear systems,” *Systems & Control Letters*, vol. 94, pp. 159–164, 2016.
- [12] M. Ogura and V. M. Preciado, “Epidemic processes over adaptive state-dependent networks,” *Physical Review E*, vol. 93, p. 062316, 2016.
- [13] M. Ogura and V. M. Preciado, “Stability of Markov regenerative switched linear systems,” *Automatica*, vol. 69, pp. 169–175, 2016.
- [14] M. Ogura and V. M. Preciado, “Stability of spreading processes over time-varying large-scale networks,” *IEEE Transactions on Network Science and Engineering*, vol. 3, no. 1, pp. 44–57, 2016. **(Runner-up of 2019 IEEE TNSE Best Paper Award)**
- [15] M. Ogura and C. F. Martin, “Stability analysis of linear systems subject to regenerative switchings,” *Systems & Control Letters*, vol. 75, pp. 94–100, 2015.
- [16] M. Ogura and C. F. Martin, “A limit formula for joint spectral radius with p -radius of probability distributions,” *Linear Algebra and its Applications*, vol. 458, pp. 605–625, 2014. hoge
- [17] M. Ogura and C. F. Martin, “Stability analysis of positive semi-Markovian jump linear systems with state resets,” *SIAM Journal on Control and Optimization*, vol. 52, pp. 1809–1831, 2014.
- [18] M. Ogura and C. F. Martin, “Generalized joint spectral radius and stability of switching systems,” *Linear Algebra and its Applications*, vol. 439, no. 8, pp. 2222–2239, 2013.
- [19] M. Ogura and Y. Yamamoto, “Dissipativity of pseudorotational behaviors,” *IEEE Transactions on Automatic Control*, vol. 58, no. 4, pp. 823–833, 2013.
- [20] M. Nagahara, M. Ogura, and Y. Yamamoto, “ H^∞ design of periodically nonuniform interpolation and decimation for non-band-limited signals,” *SICE Journal of Control, Measurement, and System Integration*, vol. 4, no. 5, pp. 341–348, 2011. **(2012 SICE Best Paper Award)**

Refereed Conference Proceedings

- [1] M. Ogura, M. Kishida, K. Hayashi, and J. Lam, “Geometric programming for optimizing stability of distributed power control algorithms,” in *SICE Annual Conference 2019* (accepted), 2019.
- [2] M. Ogura, W. Mei, and K. Sugimoto, “Upper-bounding dynamics on networked synergistic susceptible-infected-susceptible model,” in *SICE Annual Conference 2019* (accepted), 2019.
- [3] M. Ogura, M. Kishida, K. Hayashi, and J. Lam, “Resource allocation for robust stabilization of Foschini-Miljanic Algorithm,” in *2019 American Control Conference* (accepted), 2019.
- [4] M. Kumazaki, M. Ogura, and T. Tachibana, “VNF management with model predictive control for multiple service chains,” in *IEEE International Conference on Consumer Electronics – Taiwan*, 2019.
- [5] T. Tadenuma, M. Ogura, and K. Sugimoto, “Sampled-data state observation over lossy networks under round-robin scheduling,” in *5th IFAC Conference on Analysis and Control of Chaotic Systems*, 2018, pp. 197–202. **(Young Author Award Finalist)**
- [6] W. Mei and M. Ogura, “Instability analysis of Markov jump linear systems by spectral optimization,” in *SICE Annual Conference 2018*, 2018, pp. 419–422.

- [7] M. Ogura, J. Wan, and S. Kasahara, “Model predictive control for energy-efficient operation of data centers with cold aisle containments,” in *6th IFAC Conference on Nonlinear Model Predictive Control*, 2018, pp. 241–246.
- [8] M. Ogura and J. Harada, “Resource allocation for containing epidemics from temporal network data,” in *23rd International Symposium on Mathematical Theory of Networks and Systems*, 2018, pp. 537–542.
- [9] M. Ogura, J. Tagawa, and N. Masuda, “Distributed agreement on activity driven networks,” in *2018 American Control Conference*, 2018, pp. 4147–4152.
- [10] X. Chen, M. Ogura, K. R. Ghusinga, A. Singh, and V. M. Preciado, “Semidefinite bounds for moment dynamics: Application to epidemics on networks,” in *56th IEEE Conference on Decision and Control*, 2017, pp. 2448–2454.
- [11] M. Wakaiki, M. Ogura, and J. P. Hespanha, “Linear quadratic control for sampled-data systems with stochastic delays,” in *2017 American Control Conference*, 2017, pp. 1978–1983.
- [12] M. Ogura and V. M. Preciado, “Katz centrality of Markovian temporal networks: analysis and optimization,” in *2017 American Control Conference*, 2017, pp. 5001–5006.
- [13] M. Ogura, M. Wakaiki, and V. M. Preciado, “Dynamic analysis of bet-hedging strategies as a protection mechanism against environmental fluctuations,” in *55th IEEE Conference on Decision and Control*, 2016, pp. 4178–4183.
- [14] M. Ogura and V. M. Preciado, “Efficient containment of exact SIR Markovian processes on networks,” in *55th IEEE Conference on Decision and Control*, 2016, pp. 967–972.
- [15] M. Wakaiki, M. Ogura, and J. P. Hespanha, “Robust stability under asynchronous sensing and control,” in *55th IEEE Conference on Decision and Control*, 2016, pp. 5962–5967.
- [16] M. Ogura, A. Cetinkaya, T. Hayakawa, and V. M. Preciado, “Efficient criteria for stability of large-scale networked control systems,” in *6th IFAC Workshop on Distributed Estimation and Control in Networked Systems*, 2016, pp. 13–18.
- [17] V. M. Preciado and M. Ogura, “Structural analysis of spreading processes from ego-nets,” in *6th IFAC Workshop on Distributed Estimation and Control in Networked Systems*, 2016, pp. 345–350.
- [18] M. Ogura, M. Wakaiki, J. P. Hespanha, and V. M. Preciado, “ L^2 -gain analysis of regenerative switched linear systems under sampled-data state-feedback control,” in *2016 American Control Conference*, 2016, pp. 709–714.
- [19] M. Ogura and V. M. Preciado, “Optimal design of networks of positive linear systems under stochastic uncertainty,” in *2016 American Control Conference*, 2016, pp. 2930–2935.
- [20] M. Ogura and V. M. Preciado, “Cost-optimal switching protection strategy in adaptive networks,” in *54th IEEE Conference on Decision and Control*, 2015, pp. 3574–3579.
- [21] M. Ogura and V. M. Preciado, “Spreading processes over socio-technical networks with phase-type transmissions,” in *54th IEEE Conference on Decision and Control*, 2015, pp. 3548–3553.

- [22] C. Nowzari, M. Ogura, V. M. Preciado, and G. J. Pappas, “A general class of spreading processes with non-Markovian dynamics,” in *54th IEEE Conference on Decision and Control*, 2015, pp. 5073–5078.
- [23] C. Nowzari, M. Ogura, V. M. Preciado, and G. J. Pappas, “Optimal resource allocation for containing epidemics on time-varying networks,” in *49th Asilomar Conference on Signals, Systems and Computers*, 2015, pp. 1333–1337.
- [24] M. Ogura, M. Nagahara, and V. M. Preciado, “ L^1 -optimal disturbance rejection for disease spread over time-varying networks,” in *SWARM 2015: The First International Symposium on Swarm Behavior and Bio-Inspired Robotics*, 2015, pp. 377–378.
- [25] M. Ogura and V. M. Preciado, “Disease spread over randomly switched large-scale networks,” in *2015 American Control Conference*, 2015, pp. 1782–1787.
- [26] M. Ogura, A. Cetinkaya, and V. M. Preciado, “State-feedback stabilization of Markov jump linear systems with randomly observed markov states,” in *2015 American Control Conference*, 2015, pp. 1764–1769.
- [27] M. Ogura and R. M. Jungers, “Efficiently computable lower bounds for the p -radius of switching linear systems,” in *53rd IEEE Conference on Decision and Control*, 2014, pp. 5463–5468.
- [28] M. Ogura and C. F. Martin, “Mean stability of continuous-time semi-Markov jump linear positive systems,” in *2014 American Control Conference*, 2014, pp. 3261–3266.
- [29] M. Ogura and C. F. Martin, “On the mean stability of a class of switched linear systems,” in *52nd IEEE Conference on Decision and Control*, 2013, pp. 97–102.
- [30] M. Ogura and C. F. Martin, “Stability of switching systems and generalized joint spectral radius,” in *2013 European Control Conference*, 2013, pp. 3185–3190.
- [31] M. Ogura and C. F. Martin, “Stochastic properties of switched Riccati differential equations,” in *51st IEEE Conference on Decision and Control*, 2012, pp. 1319–1324.
- [32] M. Ogura, Y. Yamamoto, and J. C. Willems, “On the dissipativity of pseudorational behaviors,” in *49th IEEE Conference on Decision and Control*, 2010, pp. 1737–1742.
- [33] M. Ogura and Y. Yamamoto, “Dissipativity of pseudorational behaviors,” in *19th International Symposium on Mathematical Theory of Networks and Systems*, 2010, pp. 849–853.
- [34] Y. Yamamoto, J. C. Willems, and M. Ogura, “Pseudorational behaviors and Bezoutians,” in *19th International Symposium on Mathematical Theory of Networks and Systems*, 2010, pp. 1917–1921.
- [35] M. Ogura and Y. Yamamoto, “Hankel norm computation for pseudorational transfer functions,” in *48th IEEE Conference on Decision and Control held jointly with 2009 28th Chinese Control Conference*, 2009, pp. 5502–5507.
- [36] M. Nagahara, M. Ogura, and Y. Yamamoto, “A novel approach to repetitive control via sampled-data H^∞ filters,” in *7th Asian Control Conference*, 2009, pp. 160–165.
- [37] M. Nagahara, M. Ogura, and Y. Yamamoto, “Interpolation of nonuniformly decimated signals via sampled-data H^∞ optimization,” in *SICE Annual Conference 2008*, 2008, pp. 1151–1154.

- [38] M. Ogura, M. Nagahara, and Y. Yamamoto, “Optimal wavelet expansion via sampled-data H^∞ control theory,” in *SICE Annual Conference 2007*, 2007, pp. 1422–1426.

Invited and Hourly Talks

- [1] “Networked epidemic spreading: modeling, analysis, and control,” *National Insitutite of Informatics*, 2018.
- [2] “Network epidemiology and control theory,” *University of Hong Kong*, 2018.
- [3] “Analysis and control of spreading processes over complex networks,” *Washington State University*, 2017.
- [4] “Analysis and control of spreading processes over complex networks,” *Tokyo University of Agriculture and Technology*, 2016.
- [5] “Stability analysis of switched linear systems with non-traditional switching signals,” in *GRASP special seminar*, University of Pennsylvania, 2014.
- [6] “Mean stability of switched linear systems,” *Université Catholique de Louvain*, 2013.

TEACHING ACTIVITIES

Nara Institute of Science and Technology

- Advanced Intelligent System Control (Spring 2017, 2018)

University of Pennsylvania

Co-lecturer:

- Convex Optimization in Systems and Control (Fall 2015)

Texas Tech University

Graduate Part-Time Instructor:

- Calculus II (Summer 2014, Spring 2014, Spring 2013)
- Calculus I (Summer 2013, Fall 2012)
- Trigonometry (Fall 2011)
- College Algebra (Fall 2013, Spring 2012)

Teaching Assistant:

- Advanced Calculus (Summer 2012)
- Linear Algebra (Summer 2012)
- Higher Mathematics for Engineers and Scientists I (Summer 2011)

Kyoto School of Computer Science

Lecturer:

- Control Engineering (Fall 2009, Fall 2008)
- Electrical Circuits (Spring 2008)
- Data Structures (Spring 2008)
- Numerical Analysis (Spring 2010, Spring 2009)

Kyoto University

Teaching Assistant:

- Modern Control Theory (Fall 2009, Fall 2008)

PROFESSIONAL SERVICE

Local Arrangements Vice Chair: SICE Annual Conference 2018

Associate Editor: The 5th IFAC Workshop on Distributed Estimation and Control in Networked Systems (2015)

Reviewer: IEEE Transactions on Automatic Control; IEEE Transactions on Control of Network Systems; IEEE Transactions on Network Science and Engineering, Annual Reviews in Control; Automatica; SIAM Journal on Control and Optimization; Systems and Control Letters; IEEE Transactions on Circuits and Systems; Foundations of Computational Mathematics; Nonlinear Analysis: Hybrid Systems; International Journal of Robust and Nonlinear Control; Asian Journal of Control; European Physical Journal B; Physics Letters A; Neurocomputing; Applied Mathematics and Computation; IEEE Conference on Decision and Control; American Control Conference; European Control Conference; SIAM Conference on Control and Its Applications; IEEE Multi-Conference on Systems and Control; IFAC Workshop on Distributed Estimation and Control in Networked Systems

Masaki Ogura, June 2019