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Curriculum Vitae

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専門分野

ネットワーク科学，制御工学，最適化，確率過程，設計工学

学歴

2014年8月	テキサス工科大学 Ph.D. (Mathematics)
2009年3月	京都大学 修士（情報学）
2007年3月	京都大学 学士（工学）

職歴

2017年3月–	奈良先端科学技術大学院大学 助教
2014年11月–2017年2月	ペンシルバニア大学 電気システム工学科 博士研究員

短期滞在

2018年7月	香港大学 （香港）
2013年11月	ルーヴァン・カトリック大学 （ベルギー）

代表的な受賞

2019年2月	IEEE Transactions on Network Science and Engineering 準最優秀論文賞
2018年3月	計測自動制御学会 制御部門 制御部門大会賞
2018年1月	計測自動制御学会 関西支部 支部長賞 奨励賞
2014年4月	テキサス工科大学 Summer Dissertation/Thesis Research Award
2013年7月	テキサス工科大学 Cash Family Endowed Fellowship
2012年6月	計測自動制御学会 論文賞

研究助成

- 国立情報学研究所 自由提案公募型共同研究 2019年度
- 国立情報学研究所 自由提案公募型共同研究 2018年度
- 科学研究費 若手研究 2018年度～2020年度 ネットワークにおける伝播の解析と制御：モチーフを活用した多項式時間アルゴリズム
- 科学研究費 基盤研究B 2018年度～2021年度 計測や通信の品質が保証されない環境下での事象トリガ調整型2自由度制御系（代表者 杉本謙二）

研究業績

著書

[1] 永原編著 and 小蔵ほか著, ネットワーク化制御（刊行予定）. コロナ社, 2019.

著書（**book chapter**）

[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. Trumpf, Eds. CreateSpace, 2013, pp. 291–300.

招待講演等

[1] "幾何計画法の制御応用," 電子情報通信学会信号処理研究会, 2019.

[2] "Networked epidemic spreading: modeling, analysis, and control," *National Insitutite of Informatics*, 2018.

[3] "ネットワークにおける確率的伝播モデルの解析と制御," 日本オペレーションズ・リサーチ学会第*279*回待ち行列研究部会, 2018.

[4] "重要人物はだれ？～つながりを科学する," 生駒市立中学校出前授業, 2018.

[5] "Network epidemiology and control theory," *University of Hong Kong*, 2018.

[6] "テンポラルネットワークの数理モデリング," 第*62*回システム制御情報学会研究発表講演会, 2018.

[7] "じゃんけんでまなぶ複雑ネットワーク," 生駒市立中学校出前授業, 2017.

[8] "How can we "control" spreading processes over complex networks?" 第*4*回数理モデリング研究会, 2017.

[9] "伝播の解析と制御：確率微分方程式によるアプローチ," *ERATO*河原林プロジェクト複雑ネットワーク・地図グラフセミナー, 2017.

[10] "Analysis and control of spreading processes over complex networks," *Washington State University*, 2017.

[11] "Analysis and control of spreading processes over complex networks," *Tokyo University of Agriculture and Technology*, 2016.

[12] "Dynamical systems over time-varying networks," *Workshop on Recent Advances in Systems and Control*, Kyoto University, 2015.

[13] "Dynamical systems over time-varying networks," *Tokyo Institute of Technology*, 2015.

[14] "Stability analysis of switched linear systems with non-traditional switching signals," in *GRASP special seminar*, University of Pennsylvania, 2014.

[15] "Mean stability of switched linear systems," *Université Catholique de Louvain*, 2013.

解説・総説

[1] 小蔵, "複雑ネットワークにおける最適資源配置—Geometric program によるアプローチ—," 電子情報通信学会基礎・境界ソサイエティ *IEICE Fundamentals Review*, vol. 12, no. 3, pp. 191–200, 2019.

[2] 小蔵, "フェイルセーフな海外研究生活," システム／制御／情報, vol. 11, pp. 449–454, 2018.

[3] 小蔵, "テンポラルネットワーク上の伝播過程," 計測と制御, vol. 55, no. 11, pp. 942–947, 2016.

査読付き論文

[1] 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.

[2] 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.

[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] 蓼沼, 小蔵, and 杉本, "信号損失を考慮したゲイン切り替え型状態オブザーバの設計," 計測自動制御学会論文集, vol. 55, no. 3, 2019.

[6] 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.

[7] 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.

[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, 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.

[10] 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.

[11] 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.

[12] 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.

[13] M. Ogura and V. M. Preciado, "Epidemic processes over adaptive state-dependent networks," *Physical Review E*, vol. 93, p. 062316, 2016.

[14] M. Ogura and V. M. Preciado, "Stability of Markov regenerative switched linear systems," *Automatica*, vol. 69, pp. 169–175, 2016.

[15] 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)**

[16] M. Ogura and C. F. Martin, "Stability analysis of linear systems subject to regenerative switchings," *Systems & Control Letters*, vol. 75, pp. 94–100, 2015.

[17] 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

[18] 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.

[19] 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.

[20] M. Ogura and Y. Yamamoto, "Dissipativity of pseudorational behaviors," *IEEE Transactions on Automatic Control*, vol. 58, no. 4, pp. 823–833, 2013.

[21] 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)**

査読付き国際会議論文

[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 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.

[14] 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.

[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] 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.

[17] 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.

[18] 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.

[19] 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.

[20] 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.

[21] 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.

[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] 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.

[24] 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.

[25] 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.

[26] M. Ogura and V. M. Preciado, "Disease spread over randomly switched large-scale networks," in *2015 American Control Conference*, 2015, pp. 1782–1787.

[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.

学会発表

[1] 会田, 高野, and 小蔵, “ユーザダイナミクスの基礎方程式とオンライン社会ネットワークの構造について,” 電子情報通信学会情報ネットワーク研究会（発表予定）, 2019.

[2] 小蔵, “Epidemic spreading processes over adaptive activity-driven networks,” 第*9*回数理モデリング研究会（発表予定）, 2019.

[3] 森, 小蔵, A. Cetinkaya, and 杉本, “Particle Swarm Optimizationを用いたマルコフ過程の補間,” 第*63*回システム制御情報学会研究発表講演会, 2019.

[4] 八木, 小蔵, 岸田, 杉本, and 林, “構造的不確かさをもつ環境における分散送信電力制御アルゴリズムのロバスト安定化,” 電子情報通信学会無線通信システム研究会, 2019.

[5] 原田, 小蔵, and 杉本, “確率的に不確かなネットワークにおける最適資源配置,” 第*6*回計測自動制御学会制御部門マルチシンポジウム, pp. 3D1–5, 2019.

[6] 熊崎, 小蔵, and 橘, “複数サービスチェインに対するモデル予測制御を用いたVNFインスタンス管理法,” *2019*年電子情報通信学会総合大会, 2019.

[7] 蓼沼, 小蔵, and 杉本, “有限パケットロス下におけるゲイン切り替え型オブザーバベース安定化制御,” 第*6*回計測自動制御学会制御部門マルチシンポジウム, pp. 2F2–6, 2019.

[8] 趙, 小蔵, and 杉本, “時変通信環境における分散送信電力制御アルゴリズム,” 電子情報通信学会高信頼制御通信研究会, 2019.

[9] 阿部, 小蔵, 辻, 三浦, and 足立, “Geometric Programmingによる衛星通信ネットワーク設計法の検討,” 電子情報通信学会高信頼制御通信研究会, 2018.

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[11] 原田, 小蔵, 岸田, and 杉本, “設計プロジェクトにおける追加タスクの影響を最小化するためのロバスト最適化,” 日本機械学会第*28*回設計工学・システム部門講演会, 2018.

[12] 多川, 小蔵, and 杉本, “Simplicial activity-drivenネットワークにおける合意制御,” 第*61*回自動制御連合講演会, pp. 1421–1425, 2018.

[13] 小蔵, “設計構造行列のすすめ,” 第*6*回数理モデリング研究会, 2018.

[14] 廣島, 小蔵, 杉本, and 橘, “サービスチェイニングにおけるVNFインスタンス管理のためのモデル予測制御,” *2018*年電子情報通信学会総合大会, pp. B–6–9, 2018.

[15] 蓼沼, 小蔵, and 杉本, “ゲイン切り替えを用いた不定期サンプリング状態オブザーバの設計,” 第*5*回計測自動制御学会制御部門マルチシンポジウム, pp. Su43–5, 2018.

[16] 小蔵 and 原田, “非負システムの最適制御問題の対数凸性,” 第*5*回計測自動制御学会制御部門マルチシンポジウム, pp. Fr63–3, 2018.

[17] 多川, 小蔵, 増田, and 杉本, “Activity-drivenネットワークにおける平均合意の収束性能解析,” 第*5*回計測自動制御学会制御部門マルチシンポジウム, pp. Su23–3, 2018.

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[19] 小蔵, “複雑ネットワークにおける影響最大化：非負システムによるアプローチ,” 第*60*回自動制御連合講演会, 2017.

[20] 原田 and 小蔵, “製品開発における資源配置の最適化手法の提案,” 第*60*回自動制御連合講演会, 2017.

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[22] 若生 and 小蔵, “確率的な時間遅れを含むシステムの最適制御,” 第*4*回制御部門マルチシンポジウム, pp. 3D2–2, 2017. **(制御部門大会賞)**

[23] 若生 and 小蔵, “不確かなサンプル時刻をもつシステムのロバスト安定性解析,” 第*3*回制御部門マルチシンポジウム, pp. 2C3–1, 2016.

[24] 小蔵, 永原, and V. M. Preciado, “伝染病拡散抑制のための最適制御,” 電子情報通信学会ヘルスケア・医療情報通信技術研究会, 2016.

[25] M. Ogura and C. F. Martin, “A characterization of joint spectral radius with the p-radius of distributions,” in *AMS 2014 Spring Central Sectional Meeting*, 2014.

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[27] 若生, 小蔵, and 山本, “擬有理型伝達関数に対するNehari問題,” 第*54*回システム制御情報学会研究発表講演会, 2010.

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[29] 小蔵, 永原, and 山本, “繰り返し制御系のサンプル値H^∞設計,” 第*38*回制御理論シンポジウム, 2009.

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[31] 小蔵, 永原, and 山本, “サンプル値H^∞制御理論による最適ウェーブレット展開,” 第*36*回制御理論シンポジウム, 2007.

[32] 小蔵, 永原, and 山本, “サンプル値H^∞制御理論による最適ウェーブレット展開,” 第*7*回制御部門大会, 2007.

教育経験

奈良先端科学技術大学院大学
- 情報科学特別講義 (2018)
- 知能システム制御特論 (2017, 2018)

ペンシルバニア大学
- Convex Optimization in Systems and Control (Co-lecturer, Fall 2015)

テキサス工科大学
- 講師
  - Calculus II (Summer 2014, Spring 2014, Spring 2013)
  - Calculus I (Summer 2013, Fall 2012)
  - Trigonometry (Fall 2011)
  - College Algebra (Fall 2013, Spring 2012)
- ティーチングアシスタント
  - Advanced Calculus (Summer 2012)
  - Linear Algebra (Summer 2012)
  - Higher Mathematics for Engineers and Scientists I (Summer 2011)

京都コンピュータ学院
- 制御工学 (2009, 2009)
- 電気回路 (2008)
- データ構造 (2008)
- 数値解析 (2009, 2010)

京都大学（ティーチング・アシスタント）
- 自然現象と数学 (2009)
- 現代制御論 (2008, 2009)

学会活動

- 2019年度～：計測自動制御学会 関西支部 庶務幹事
- 2019年～：計測自動制御学会 制御部門 真なるダイナミクスの追求による次世代システム制御理論調査研究委員会，委員
- 2018年度～：電子情報通信学会 高信頼制御通信研究会(RCC)，幹事補佐
- 2018年～：計測自動制御学会 制御部門 IoT時代に向けたイベントベースト制御調査研究会，委員
- 2018年：Local Arrangements Vice Chair, SICE Annual Conference 2018
- 2017年～：International Federation of Automatic Control, Technical Committee 1.5. Networked Systems, Member
- 2015年：5th IFAC Workshop on Distributed Estimation and Control in Networked Systems, Associate Editor