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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

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

職歴

- 大阪大学 准教授, 2019年11月–
- 奈良先端科学技術大学院大学 助教, 2017年3月 – 2019年10月
- ペンシルバニア大学 電気システム工学科 博士研究員, 2014年10月 – 2017年2月

短期滞在

- Department of Mechanical Engineering, University of Hong Kong. 2018年, 2019年
- ICTTEAM Institute, Université catholique de Louvain, Belgium. 2013年

代表的な受賞

- 計測自動制御学会 著述賞. 2021年
- Runner-up of the 2019 Best Paper Award, *IEEE Transactions on Network Science and Engineering*. 2019年
- 計測自動制御学会 関西支部 支部長賞 奨励賞. 2018年
- 計測自動制御学会 制御部門 制御部門大会賞. 2018年
- Summer Dissertation/Thesis Research Award, Texas Tech University. 2014年
- Cash Family Endowed Fellowship, Texas Tech University. 2013年
- 計測自動制御学会 論文賞. 2012年

研究助成 (科学研究費など)

- 科学研究費基盤研究 (B) 「異種マルチエージェントシステム制御における拡散的外部刺激の理論体系の確立と実検証」 (研究代表者, 2021/04-2025/03)
- 科学研究費基盤研究 (B) 「計測・通信品質が保証されない環境下の多目的フィードフォワード最適制御と強化学習」 (研究分担者, 2021/04-2025/03)
- 科学技術振興機構戦略的創造研究推進事業 CREST 「CyPhAI: Formal Analysis and Design of AI-intensive Cyber-Physical Systems」 (研究参加者, 2020-)
- 科学研究費若手研究 「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」 (研究代表者, 2018/04-2021/03)
- 科学研究費基盤研究 (B) 「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」 (研究分担者, 2018/04-2021/03)

研究助成 (企業・財団など)

- 大阪大学大学院情報科学研究科情報科学研究科スタートアッププログラム 「深層展開によるモデルベース制御系設計: 汎用性・有効性・使用性への挑戦」 (研究代表者, 2021/05-2022/03)
- 公益財団法人電気通信普及財団研究調査助成 「深層学習を用いた超高精度な行列因子分解」 (研究調査代表者, 2020/04-2021/03)
- モビリティ基盤数理研究ユニット動的ネットワーク制御チーム (メンバー, 2019-)
- 公益財団法人電気通信普及財団海外渡航旅費援助 (2019)

- 奈良先端科学技術大学院大学次世代融合領域研究推進プロジェクト「計測・解析・制御が融合したデータ駆動型細胞制御システムの開発」(共同研究者, 2019/04-2021/03)
- 国立情報学研究所自由提案公募型共同研究「製品開発プロセスをロバスト化するための経営資源割当手法」(研究代表者, 2019/04-2020/03)
- 国立情報学研究所自由提案公募型共同研究「幾何計画による非負システムに対する最適制御系設計」(研究代表者, 2018/04-2019/03)
- 産学連携 株式会社ダイヘン (共同研究者, 2017-2020)

研究業績

著書

- [1] 永原正章, 岡野訓尚, 小蔵正輝, and 若生将史, ネットワーク化制御. コロナ社, 2019. 計測自動制御学会著述賞.

著書 (book chapter)

- [1] K. Sakurama, K. Kashima, T. Ikeda, N. Hayashi, K. Hoshino, M. Ogura, and C. Zhao, “System-Control-Based Approach to Car-Sharing Systems,” in *Advanced Mathematical Science for Mobility Society*. Springer Singapore, 2024, pp. 127–171.
- [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, 2020, pp. 293–322.
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- [4] 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] “Enhancing Control System Design through Deep Unfolding: A Systematic Approach,” *University of Hawaii at Manoa*, 2023.
- [2] “Perspectives on Artificial Intelligence,” *2nd Japanese-Canadian Frontiers of Science (JCFoS) Symposium*, 2023.
- [3] “When deep unfolding meets control engineering,” *37th International Technical Conference on Circuits/Systems, Computers and Communications*, 2022.
- [4] “深層展開を用いた汎用性の高いシステム制御技術の開発,” 電子情報通信学会コミュニケーションシステム研究会, 2022.
- [5] “深層展開を用いたモデルベース制御系設計,” 第66回システム制御情報学会研究発表講演会, 2022.
- [6] “深層展開と制御工学が出会うとき,” 電子情報通信学会信号処理研究会, 2022.
- [7] “Panel Discussion: What have we learned so far?” *59th IEEE Conference on Decision and Control*, 2020.
- [8] “アメリカでの学位取得後の職探し,” 海外で活躍する若者たち: コロナを乗り切る留学・就職・長期滞在のノウハウ, 2020.
- [9] “社会的距離戦略の数理: ネットワーク科学の観点から,” 第1回SICEポストコロナ未来社会ワークショップ, 2020.
- [10] “感染症×制御工学×ネットワーク,” *Multi-Scale Neural Networks Laboratory*, 京都大学, 2020.
- [11] “ネットワーク化制御—サイバーフィジカルシステムを理解し, 制御するために—,” 2020年1月高信頼制御通信研究会, 2020.

- [12] “Optimization of positive linear systems via geometric programming,” *Guandong University of Technology*, 2019.
- [13] “Optimization of positive linear systems via geometric programming,” *Shenzhen University*, 2019.
- [14] “Synthesis of positive linear systems by geometric programming,” *University of Hong Kong*, 2019.
- [15] “ネットワークにおける最適資源配置,” ネットワーク科学セミナー2019, 2019.
- [16] “複雑ネットワークの最適設計：なぜ私がネットワーク科学と制御工学のはざまにいるのか,” 足立研セミナー, 2019.
- [17] “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.
- [18] “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.
- [19] “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.
- [20] “Network epidemiology and control theory,” *University of Hong Kong*, 2018.
- [21] “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.
- [22] “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.
- [23] “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.
- [24] “How can we “control” spreading processes over complex networks?” 第4回数値モデリング研究会, 2017.
- [25] “Analysis and control of spreading processes over complex networks,” *Washington State University*, 2017.
- [26] “Analysis and control of spreading processes over complex networks,” *Tokyo University of Agriculture and Technology*, 2016.
- [27] “Dynamical systems over time-varying networks,” *Workshop on Recent Advances in Systems and Control*, Kyoto University, 2015.
- [28] “Dynamical systems over time-varying networks,” *Tokyo Institute of Technology*, 2015.
- [29] “Stability analysis of switched linear systems with non-traditional switching signals,” in *GRASP special seminar*, University of Pennsylvania, 2014.
- [30] “Mean stability of switched linear systems,” *Université Catholique de Louvain*, 2013.

解説・総説

- [1] 趙成岩 and 小蔵正輝, “DC計画を用いたカーシェアリングネットワークの最適化,” システム/制御/情報, vol. 67, no. 10, pp. 427–432, 2023.
- [2] M. Ogura and C. Nowzari, “Special issue: modeling, analysis, and control of epidemics in networks,” *Mathematical Biosciences and Engineering*, vol. 20, no. 5, pp. 8446–8447, 2023.
- [3] 櫻間一徳 and 小蔵正輝, “移動体の群制御—I,” システム/制御/情報, vol. 67, no. 2, pp. 87–94, 2023.
- [4] 木村達明 and 小蔵正輝, “UAV空中基地局ネットワークの自律分散型配置法,” システム/制御/情報, vol. 66, no. 11, pp. 434–439, 2022.
- [5] 小蔵正輝, “複雑ネットワーク解析における非バックトラック,” 電子情報通信学会誌, vol. 105, no. 1, pp. 27–32, 2022.
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- [8] 小蔵正輝, 岸田昌子, and 林参, “大規模非負システムの幾何計画による最適設計,” 計測と制御, vol. 60, no. 1, pp. 59–64, 2021.
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- [1] C. Zhao, B. Zhu, M. Ogura, and J. Lam, “Probability rate optimization of positive Markov jump linear systems via DC programming,” *Asian Journal of Control* (accepted for publication), 2024.
- [2] 多川純平, 小蔵正輝, and 杉本謙二, “Sparse Activity-Driven ネットワークにおける平均合意の収束性能解析,” 計測自動制御学会論文集 (accepted for publication), 2024.
- [3] W. Imahayashi, Y. Tsunoda, and M. Ogura, “Route design in sheepdog system—traveling salesman problem formulation and evolutionary computation solution—,” *Advanced Robotics* (accepted for publication), 2024.
- [4] M. Ogura and C. F. Martin, “Mean escape time of switched Riccati differential equations,” *Journal of the Franklin Institute*, vol. 360, no. 10, pp. 6827–6845, 2023.
- [5] C. Zhao, K. Sakurama, and M. Ogura, “Optimization of buffer networks via DC programming,” *IEEE Transactions on Circuits and Systems II: Express Briefs*, vol. 70, no. 2, pp. 606–610, 2023.
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- [7] M. Ogura and N. Wakamiya, “Reduced-order model predictive control of a fish schooling model,” *Nonlinear Analysis: Hybrid Systems*, vol. 49, p. 101342, 2023.
- [8] C. Zhao, B. Zhu, M. Ogura, and J. Lam, “Parameterized synthesis of discrete-time positive linear systems: A geometric programming perspective,” *IEEE Control Systems Letters*, vol. 7, pp. 2551–2556, 2023.
- [9] 和田弘匡, 小蔵正輝, 岸田昌子, and 若宮直紀, “深層展開を用いた静的出力フィードバック安定化におけるハイパーパラメータの考察,” 計測自動制御学会論文集, vol. 59, no. 7, pp. 309–320, 2023.
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教育経験

大阪大学大学院情報科学研究科

- バイオネットワーク基礎理論 (2021-)
- バイオ情報工学入門 (2020-)
- バイオネットワーク工学 (2020-)

大阪大学基礎工学部

- 情報数学基礎 (2021-)
- 基礎工学のための情報学 I (2020-)
- 基礎工学 PBL(情報工学) (2020-)
- 情報科学ゼミナール (2020-)

奈良先端科学技術大学院大学

- 機械学習と知的制御 (2019)
- 情報科学特別講義 (2018)
- 知的システム制御特論 (2017)

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

- 2020年～：Program Committee member, International Conference on Complex Networks and their Applications
- 2020年～：Associate Editor, Journal of The Franklin Institute
- 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