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Curriculum Vitae

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専門分野

群制御，人工知能，自己組織化，複雑システム

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

- 広島大学 教授，2024年4月 –
- 大阪大学 招へい教授，2024年4月 – 2025年3月
- 大阪大学 准教授，2019年11月 – 2024年3月
- 奈良先端科学技術大学院大学 客員准教授，2020年4月 – 2021年3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
- ICTEAM Institute, Université catholique de Louvain, Belgium. 2013年

受賞

- 2023年システム数理と応用研究会優秀論文賞 (2024)
- 計測自動制御学会 著述賞 (2021)
- 電子情報通信学会ネットワークシステム研究専門委員会第8回英語セッション奨励賞（2020）
- 電子情報通信学会情報ネットワーク研究会第26回情報ネットワーク研究賞（2019）
- Runner-up of the 2019 Best Paper Award, *IEEE Transactions on Network Science and Engineering* (2019)
- 計測自動制御学会 関西支部 支部長賞 奨励賞 (2018)
- 計測自動制御学会 制御部門 制御部門大会賞 (2018)
- Summer Dissertation/Thesis Research Award, Texas Tech University (2014)
- Cash Family Endowed Fellowship, Texas Tech University (2013)
- 計測自動制御学会 論文賞 (2012)

指導学生や共著者などの受賞

- 李, 計測自動制御学会優秀学生賞 (2023, 指導学生)
- 李, 大阪大学大学院情報科学研究科情報科学研究科賞 (2023, 指導学生)
- 藤岡, Finalist of SICE Annual Conference 2022 Young Author’s Award (2022, 指導学生)
- 阿部, 第36回電気通信普及財団賞テレコムシステム技術学生賞 (2021, 共著者)
- 森, 2019年11月高信頼制御通信研究会ベストポスター賞 (2019, 指導学生)
- W. Mei, China Scholarship Council Scholarship for Doctoral Studies (2019, 指導学生)
- 蓼沼, Young Author Award Finalist in 5th IFAC Conference on Analysis and Control of Chaotic Systems (2018, 共著者)
- W. Mei, The IET Outstanding Reviewer Awards 2018 (2019, 指導学生)

研究助成（科学研究費など）

- 科学技術振興機構戦略的創造研究推進事業 CRONOS 「デジタルサイバネティクスのための次世代通信アーキテクチャの創出」（研究参加者，2025/10-）
- 科学研究費基盤研究（B）「費用最適な観測と介入を計画するためのトビバッタ対策立案プラットフォームの構築」（研究代表者，2025/04-）
- 科学研究費基盤研究（C）「目標指令値の損失に対処する切替フィードフォワード学習制御と移動体群の形成」（研究分担者，2025/04-）
- 科学研究費基盤研究（A）「選択的漁獲のための魚群行動の理解と制御」（研究分担者，2024/04-）
- 科学技術振興機構ムーンショット型研究開発事業ムーンショット目標8 海上豪雨生成で実現する集中豪雨被害から解放される未来「データ駆動手法を用いた制御手法の開発」（課題推進者，2023/12-）
- 科学技術振興機構ムーンショット型研究開発事業ムーンショット目標3 人・AIロボット・生物サイボーグの共進化による新ひらめきの世界「人・AIロボット・生物サイボーグの共進化による新ひらめきの世界」（研究参加者，2023/01-2024/09）
- 科学技術振興機構ムーンショット型研究開発事業ムーンショット目標8 気象制御のための制御容易性・被害低減効果の定量化「気象制御容易性の定量化」（課題推進者，2022/06-2023/11）
- 科学研究費基盤研究（A）「深層展開に基づく信号処理アルゴリズム構築論の深化と展開」（研究分担者，2022/04-2025/03）
- 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，2021/04-2024/03）
- 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，2020/11-2026/03）
- 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）

- 2025年度国立情報学研究所公募型共同研究（研究企画会合公募型）「群制御の手法探索と社会実装へ向けた学際的な検討」（研究代表者，2025/04-2026/03）
- 2024年度国立情報学研究所公募型共同研究（研究企画会合公募型）「群制御の問題定式化，理論開拓，手法探索のための学際的な検討」（研究代表者，2024/04-2025/03）
- 令和5年度東北大学電気通信研究所共同プロジェクト研究 (区分B 萌芽的研究支援型)「牧羊犬のヒツジ追い現象におけるヒツジ・牧羊犬間の「駆け引き」メカニズムの解明」（共同研究者，2023/04-2024/03）
- 大阪大学データビリティフロンティア機構学際共創プロジェクト「機械学習と数理モデルによる細胞動態の解析手法の開発」（研究代表者，2022/10-2023/03）
- 一般財団法人テレコム先端技術研究支援センターSCAT研究費助成「多数端末収容のための無線LANに適した非直交多元接続向け自己組織型無線アクセス制御」（研究分担者，2022/04-2025/03）
- 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）
- 産学連携（2021）
- 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.

[3] M. Ogura and V. M. Preciado, "Optimal Containment of Epidemics in Temporal and Adaptive Networks," in *Temporal Networks Epidemiology*.　Springer, 2017, pp. 241–266.

[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] "Shepherding as a paradigm for swarm control," *2024 IEEE International Conference on Cyborg and Bionic Systems*, 2024.

[2] "群制御アルゴリズムの発展：牧羊犬からドローン，サイボーグインセクト群へ," 電子情報通信学会システム数理と応用研究会, 2024.

[3] "深層展開を用いたモデルベース制御系設計論," 日本*OR*学会*2024*年確率系合同部会, 2024.

[4] "深層展開を用いたモデルベース制御系設計," *Society5.0* に資する適応学習制御調査研究会第*10*回適応学習制御入門セミナー, 2024.

[5] "26年後の気象制御に向けた現在の取り組み," 計測自動制御学会「データモデル駆動による先進的流体・気象制御調査研究会」第一回研究会, 2024.

[6] "Enhancing Control System Design through Deep Unfolding:　A Systematic Approach," *University of Hawaii at Manoa*, 2023.

[7] "Perspectives on Artificial Intelligence," *2nd Japanese-Canadian Frontiers of Science (JCFoS) Symposium*, 2023.

[8] "When deep unfolding meets control engineering," *37th International Technical Conference on Circuits\Systems, Computers and Communications*, 2022.

[9] "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.

[10] "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.

[11] "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.

[12] "Panel Discussion: What have we learned so far?" *59th IEEE Conference on Decision and Control*, 2020.

[13] "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.

[14] “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.

[15] “感染症× 制御工学× ネットワーク,” *Multi-Scale Neural Networks Laboratory*，京都大学, 2020.

[16] “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.

[17] “Optimization of positive linear systems via geometric programming,” *Guandong University of Technology*, 2019.

[18] “Optimization of positive linear systems via geometric programming,” *Shenzhen University*, 2019.

[19] “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.

[20] “Synthesis of positive linear systems by geometric programming,” *University of Hong Kong*, 2019.

[21] “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.

[22] “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.

[23] “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.

[24] “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.

[25] “Network epidemiology and control theory,” *University of Hong Kong*, 2018.

[26] “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.

[27] “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.

[28] “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.

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

[30] “Analysis and control of spreading processes over complex networks,” *Washington State University*, 2017.

[31] “Analysis and control of spreading processes over complex networks,” *Tokyo University of Agriculture and Technology*, 2016.

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

[33] “Dynamical systems over time-varying networks,” *Tokyo Institute of Technology*, 2015.

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

[35] “Mean stability of switched linear systems,” *Université Catholique de Louvain*, 2013.

解説・総説

[1] 小蔵正輝 and 岸田昌子, “深層展開を用いたモデルベース制御系設計,” システム/制御/情報, vol. 68, no. 11, pp. 428–433, 2024.

[2] 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.

[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.

[6] 永原正章 and 小蔵正輝, “パンデミックとシステム・制御・ネットワーク理論,” 計測と制御, vol. 60, no. 9, pp. 641–646, 2021.

[7] 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.

[8] 小蔵正輝, “中心性を使った感染症の制御,” 経済セミナー, no. 717, pp. 42–46, 2020.

[9] 小蔵正輝, “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.

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査読付き論文

[1] Y. Chen, H. Zhao, M. Ogura, Y. Gao, and L. Peng, “Data-driven dual-channel dynamic event-triggered load frequency control for multi-area power systems with uniform quantizer,” *Science Progress* (accepted for publication), 2025.

[2] S. Yang, H. Zhao, M. Ogura, and L. Peng, “Data-driven adaptive optimal output tracking with assured convergence rate,” *Journal of the Franklin Institute*, vol. 362, no. 16, p. 108086, 2025.

[3] Y. Deng, M. Ogura, Y. Bai, Y. Wang, and M. Feroskhan, “Safety-critical control for nonlinear systems with complex input constraints,” *IEEE Transactions on Automatic Control*, vol. 70, no. 10, pp. 7016–7023, 2025.

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[8] A. Fujioka, M. Ogura, and N. Wakamiya, “Cyclic pursuit formation control for arbitrary desired shapes,” *Journal of the Franklin Institute*, vol. 362, no. 2, p. 107467, 2025.

[9] Y. Bai, P. T. T. Ngoc, H. D. Nguyen, D. L. Le, Q. H. Ha, K. Kai, Y. X. S. To, Y. Deng, J. Song, N. Wakamiya, H. Sato, and M. Ogura, “Swarm navigation of cyborg-insects in unknown obstructed soft terrain,” *Nature Communications*, vol. 16, p. Article number: 221, 2025.

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[14] J. J. R. Liu, M. Ogura, Q. Li, and J. Lam, "Learning-based stabilization of Markov jump linear systems," *Neurocomputing*, vol. 584, p. 127618, 2024.

[15] 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, vol. 60, no. 6, pp. 377–383, 2024.

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[18] 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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[20] 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

広島大学情報科学部
- 人工知能概論（2024–）
- 人工知能と機械学習（2024）

広島大学工学部
- 線形代数学II（2024–）

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
- 機械学習と知能制御（2019）
- 情報科学特別講義 (2018)
- 知能システム制御特論 (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，委員歴

- Program Committee Member, 14th International Conference on Complex Networks and their Applications
- 計測自動制御学会 制御部門 制御理論部会，委員（2025-2026）
- Associate Editor, The Journal of Engineering (2025–present)
- Technical Comittee Member, Technical Comittee on Fully Actuated System Theory and Applications (2025-present)
- 計測自動制御学会 制御部門 知的システム・ネットワーク統合のための適応学習制御調査研究会，委員（2025-present）
- International Program Committee Secretary, 8th IFAC Conference on Nonlinear Model Predictive Control
- Publication Co-Chair, 8th IFAC Conference on Nonlinear Model Predictive Control
- Program Committee Member, 13th International Conference on Complex Networks and their Applications
- Associate Editor, 10th Indian Control Conference
- 計測自動制御学会 制御部門 人の理解/誘導で強化される制御システム調査研究会，委員（2024-2025）
- External Reviewer, Research Grants Council of Hong Kong (2023, 2024)
- Reviewer, French National Research Agency (2023)
- Program Committee member, 12th International Conference on Complex Networks and their Applications
- Registration Chair, 10th IFAC Symposium on Robust Control Design
- International Advisory Committee Member, 2022 International Conference on Information Technology
- Associate Editor, IET Control Theory & Applications (2022–present)
- Associate Editor, Franklin Open (2022–present)
- Program Committee member, 11th International Conference on Complex Networks and their Applications
- 電子情報通信学会 高信頼制御通信研究会，専門委員（2022-present）
- 学術変革領域研究（A）領域番号20A403「分子サイバネ」専門委員会，委員
- Program Committee member, 10t International Conference on Complex Networks and their Applications
- Technical Program Comittee Member, 7th IEEE International Conference on Network Softwarization
- 電子情報通信学会 情報ネットワーク研究会，専門委員（2021-present）

- 計測自動制御学会論文集委員会和文論文編集委員会, アソシエイトエディター (2021-2024)
- Associate Editor, Journal of The Franklin Institute（2020-present）
- Program & Steering Committee Member, 52nd ISCIE International Symposium on Stochastic Systems Theory and Its Applications
- システム制御情報学会, 編集委員 (2020/6–2022/5)
- 計測自動制御学会 関西支部 庶務幹事（2019-2020）
- 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（2019-2021）
- Local Arrangements Vice Chair, SICE Annual Conference 2018
- 電子情報通信学会 高信頼制御通信研究会，幹事補佐（2018-2021）
- 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（2018-2019）
- Technical Comittee Member, Technical Committee 1.5. Networked Systems, International Federation of Automatic Control (2015-present).
- Associate Editor, 5th IFAC Workshop on Distributed Estimation and Control in Networked Systems

Journal Reviewer Advanced Robotics; Annual Reviews in Control; Automatica; Applied Mathematics and Computation; Applied Network Science; Asian Journal of Control; Computer Communications; Developments in the Built Environment; Discrete Mathematics; Entropy; European Journal of Control European Physical Journal B; Expert Systems With Applications; Foundations of Computational Mathematics; IEEE Access; IEEE/ACM Transactions on Computational Biology and Bioinformatics; IEEE/CAA Journal of Automatica Sinica; IEEE Circuits and Systems Magazine; IEEE Control Systems Letters; IEEE Intelligent Systems; IEEE Internet of Things Journal; IEEE Open Journal of Vehicular Technology; IEEE Transactions on Automatic Control; IEEE Transactions on Automation Science and Engineering; IEEE Transactions on Big Data; IEEE Transactions on Circuits and Systems I: Regular Papers; IEEE Transactions on Circuits and Systems II: Express Briefs; IEEE Transactions on Control of Network Systems; IEEE Transactions on Cybernetics; IEEE Transactions on Fuzzy Systems; IEEE Transactions on Network Science and Engineering; IEEE Transactions on Neural Networks and Learning Systems; IEEE Transactions on Signal and Information Processing over Networks; IEEE Transactions on Signal Processing; IEEE Transactions on Systems, Man and Cybernetics: Systems; IEEE Transactions on Mobile Computing; IET Control Theory & Applications; International Journal of Robust and Nonlinear Control; Internet Technology Letters; Journal of Aerospace Engineering; Journal of Biological Dynamics; Journal of Building Engineering; Journal of Computational Science; Journal of the Franklin Institute; Mathematics and Computers in Simulation; Mathematics of Control, Signals, and Systems; Neural Networks; Neurocomputing; Nonlinear Analysis: Hybrid Systems; Nonlinear Dynamics; Operations Research and Decisions; Optimal Control, Applications and Methods; Philosophical Transactions of the Royal Society A; Physica A; Physics Letters A; SIAM Journal on Control and Optimization; SICE Journal of Control, Measurement, and System Integration; Stochastics and Dynamics; Systems and Control Letters; Research in Engineering Design; 計測自動制御学会論文集; システム制御情報学会論文誌.