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Department of Systems and Control Engineering
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Academic Employment
Associate Professor, School of Engineering, Tokyo Tech, Apr. 2020–present
Associate Professor, Graduate School of Engineering, Osaka University, Apr. 2018–Mar. 2020
Visiting Associate Professor, School of Engineering, Tokyo Tech, Apr. 2018–Mar. 2020
Associate Professor, School of Engineering, Tokyo Tech, Apr. 2016–Mar. 2018
Faculty Sabbatical, Harvard University (Host: Prof. Na Li), USA, Jun. 2016–Jan. 2017.
Associate Professor, Mechanical and Control Engineering, Tokyo Institute of Technology, Jan. 2015–Mar. 2016
Assistant Professor, Mechanical and Control Engineering, Tokyo Institute of Technology, Apr. 2007–Dec. 2014
A Research Fellow of the Japan Society for the Promotion of Science, Apr. 2006–Mar. 2007

Education
Ph.D. Informatics, Applied Mathematics and Physics, Kyoto University, Mar. 2007
M. Informatics, Applied Mathematics and Physics, Kyoto University, Mar. 2004
B. Eng., Informatics and Mathematical Science, Kyoto University, Mar. 2002

Research Interests
Cyber-Physical & Human Systems, Networked Robotics, Energy Management Systems

Teaching (present)

2022 科学・技術の最前線 a

2021- フィードバック制御

2021- デジタル創造基礎

2021- 異分野融合研究企画集中演習（超スマート社会卓越教育院）

2020- 研究プロジェクト

2020- Optimal Control

2020- Cyber-Physical Innovation

Teaching (past)

2020-2021 システムモデリング

2020 科学・技術の創造プロセス【工学院】

2018, 2019 数学解析演習 (大阪大学)

2019 マチカネゼミ (大阪大学)

2017 Optimal Control

2017 Control of Network Systems

2016 システム制御ラボ研修

2015, 2017 システムモデリング

2016, 2017 5 類リテラシ

2016 システム創造設計

2015 創造設計第一

2015 システム制御特論

2007–2015 制御システム工学ラボ研修

2007–2010, 2012–2014 情報処理及び演習

2008–2011 創造設計第二

招待講義

[9] T. Hatanaka, "Passivity-based Robot Control and Convex Optimization," PhD Activity, University of Seville, Spain, online, May 25, 2021.
[8] 畑中, "マルチエージェントとロボットネットワークの制御," システムイノベーションセンター「システム構築のための制御講座」, online, July 4, 2020.
[7] 畑中, "ネットワークシステムと受動性," IMI コロキウム, 九州大学, May 8, 2019.
[6] 畑中, "ネットワークと受動性" 情報数理学セミナー, 大阪大学, Oct. 11, 2018.
[5] T. Hatanaka, "Automatic Control," NTUST Summer Program, National Taiwan University of Science and Technology, Taipei, Taiwan, Aug. 7, 8, 2017.
[4] 畑中, "分散最適化," SICE 第 3 回制御部門マルチシンポジウム, ワークショップ「マルチエージェントシステムの制御—IoT/CPS 時代の制御理論」, 名古屋市, 愛知, Mar. 10, 2016.
[3] 畑中, "ロボティックネットワークの協調制御," 情報デザイン先端技術, 工学院大学, Sep., 29th, 2015.
[2] 畑中, "システム制御におけるゲーム理論の動向," ワークインプログレスセミナー, Nov., 26th, 2013.
[1] 畑中, "環境のための分散協調制御の基礎," 予測・分散・協調の制御：環境への貢献を目指して, SICE セミナー「実践的な制御系設計」, 東京, 3rd, Dec., pp. 25-35, 2009.

MOOC

[1] 畑中, "スマートロボティクス (Robot Zoo Sky)," 超スマート社会への招待, 東京工業大学, `https://www.edx.org/course/introduction-to-the-super-smart-society?index=undefined`.

Service (present)

2017- Associate Editor of IEEE Transactions on Control Systems Technology

2013- Member of Conference Editorial Board of IEEE CSS

2021- IPC Member of IEEE Conference on Control Technology and Applications

2020- IFAC TC Member of TC 9.2 Social Effects of Automation and Control Systems

2020- IPC Member of IFAC Workshop on Cyber-Physical and Human Systems

2016- IPC Member of Indian Control Conference (ICC)

2012-(except 2014, 2017) TPC Member of IFAC Workshop on Distributed Estimation and Control in Networked Systems (NecSys)

2012- IFAC TC Member of TC 1.5 Networked Systems

Service (past)

2022 SICE MSCS プログラム委員長

2020 Local Arrangement Co-chair of 16th International Conference on Control & Automation

2020 第 63 回自動制御連合講演会実行委員

2020 Registration Co-chair of IFAC Workshop on Cyber-Physical and Human Systems

2019-2020 SICE 学会賞委員会委員

2019-2020 SICE Cyber-Physical & Human Systems 調査研究会 主査

2017(2)-2020(1) Associate Editor of SICE Journal of Control, Measurement, and System Integration

2018-2019 IEEE Control Systems Society Japan Chapter Secretary

2018-2019 SICE 制御理論部会委員

2018-2019 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 超スマート社会実現のためのシステム制御技術調査研究会委員

2019 Head of Editorial Board for SICE Annual Conference

2018 Associate Editor for SICE Annual Conference

2018 IPC Member of IFAC Conference on Cyber-Physical and Human Systems

2017-2018 SICE 会誌編集委員

2014, 2018 再生可能エネルギー国際会議組織委員 (分科会 10)

2017, 2018 IPC Member of IEEE Conference on Control Technology and Applications

2015(3)-2018(2) SICE 和文論文集編集委員会 Associate Editor

2017 IEEE Control Systems Society Japan Chapter Treasurer

2015-2017 SICE 都市インフラシステム構築と制御調査研究委員会委員

2015, 2017 TPC Member of International Symposium on Swarm Behavior and Bio-Inspired Robotics 2015

2015(3)-2017(3) Advanced Robotics Best Paper Award 選考委員会委員

2015-2016 SICE ネットワーク上の制御と信号処理調査研究委員会委員

2016 Member of National Organizing Committee of 6th IFAC Workshop on Distributed Estimation and Control in Networked Systems (NecSys)

2016 Associate Editor for IEEE International Conference on Control & Automation (ICCA) 2016

2015 Publication Chair for Workshop on System and Control Perspectives for Smart City

2015 第 58 回自動制御連合講演会プログラム委員会委員

2014, 2012 TPC Member of International Conference on Control, Automation, Robotics and Vision (ICARCV)

2012-2013 電子情報通信学会高信頼制御通信時限研究専門委員会委員

2012-2013 SICE 社会基盤システムにおける分散意思決定のためのシステム制御調査研究会委員

2011-2012 SICE 制御理論部会委員

2010-2011 SICE エネルギー・環境システム制御技術調査研究会副幹事

Dissertation

PhD Thesis: Analysis and Control of Systems with State and Input Constraints, Kyoto Univ., 2007
http://www.fl.ctrl.titech.ac.jp/~hatanaka/d_thesis.pdf
(平成 19 年度手島記念研究賞博士論文賞)
Master Thesis: Reference Management Using State Observers and Preview Control, Kyoto Univ., 2004
http://www.fl.ctrl.titech.ac.jp/~hatanaka/m_thesis.pdf

Research Awards

[16] 2021 年度計測自動制御学会論文集論文賞
[15] IFAC Workshop on Cyber Physical & Human Systems, Best Research Paper Award
[14] 2020 年度計測自動制御学会論文集論文賞・武田賞
[13] IEEE Senior Member Grade
[12] 2019 年度計測自動制御学会 CPD ポイント高得点者表彰
[11] 2018 年度計測自動制御学会制御部門大会賞
[10] 2017 年度計測自動制御学会制御部門研究賞（木村賞）
[9] 2016 年度計測自動制御学会学会賞（著述賞）
[8] 2015 年度計測自動制御学会論文集論文賞
[7] Asian Control Conference Best Paper Prize Award, 2015.
[6] 計測自動制御学会制御部門パイオニア賞, 2014.
[5] Best Presentation of Session Award of 2012 ACC (ThA01 Cooperative Control).
[4] Best Presentation of Session Award of 2011 ACC (ThC14 Cooperative Control VI)
[3] 2009 年度計測自動制御学会論文集論文賞
[2] 平成 19 年度手島記念研究賞博士論文賞
[1] 2005 年度計測自動制御学会学術奨励賞

Publications

被論文引用

総被引用数: 1871 (h-index:21, h10-index:44)

Books

[5] 伊吹, 山内, 畑中, 瀬戸, 機械学習のための関数解析入門 実践：学習から制御まで, 内田老鶴圃, to be published, 2023.
[4] 瀬戸, 伊吹, 畑中, 機械学習のための関数解析入門, 内田老鶴圃, 2021.
[3] T. Hatanaka, Y. Wasa and K. Uchida (eds.), "Economically-enabled Energy Management: Interplay between Control Engineering and Economics," Springer Nature, April, 2020.
[2] 東, 永原, 石井, 林, 桜間, 畑中, "マルチエージェント制御," コロナ社, 2015. **(2016 年度計測自動制御学会著述賞)**
[1] T. Hatanaka, N. Chopra, M. Fujita and M. W. Spong, *Passivity Based Control and Estimation in Networked Robotics*, Communications and Control Engineering Series, Springer-Verlag, 2015. **(More than 17,000 Chapter Downloads)**

Book Chapters

[2] 畑中, "5. 制御," 数理工学の世界, 日本評論社, pp. 118–145, 2019.
[1] 畑中, "21.4 センサネットワーク," ロボット制御学ハンドブック, 近代科学社, 2017.

Invited Article

[14] 阪口, 李, 川嶋, 遠藤, 畑中, 林, "社会的距離とモビリティ・ロボティクス・IoT," 計測と制御, 特集号「特集：ポストコロナ未来社会への科学技術」, Vol. 60, No. 9, to appear, 2021.
[13] 山内, 畑中, 藤田, "剛体運動の受動性と視覚フィードバック制御," システム/制御/情報, 特集号「受動性に基づくロボット制御」, Vol. 64, No. 12, pp. 465–470, 2020.
[12] 井上, 畑中, "エネルギー管理のためのサイバーフィジカルシステムの系統的設計," 計測と制御, Vol. 58, No. 8, pp. 612–617, 2019.

[11] 畑中，永原, “総論: Society 5.0 のためのシステム制御技術,” 計測と制御, Vol. 58, No. 8, pp. 579–582, 2019.
[10] T. Hatanaka, N. Chopra, J. Yamauchi, M. Doi, Y. Kawai and M. Fujita, “A Passivity-Based System Design of Semi-autonomous Cooperative Robotic Swarm,” ASME DSC Magazine, Vol. 5, No. 2, pp. 14–18, 2017.
[9] 畑中, “システム制御の役割って何だろう,” 巻頭言, Azbil Technical Review, pp. 1, 2017.
[8] 畑中, JST 研究開発戦略センター 2015 年研究開発俯瞰報告書 (システム科学分野), 2015.
[7] 畑中, “制御実験の授業を作ってみて,” 計測と制御, Vol. 53, No. 3, pp. 159–164, 2015.
[6] 畑中, “マルチエージェントシステムの制御-VI 分散最適化,” システム/制御/情報, 連載講座「マルチエージェント制御」, No. 3, pp. 125–132, 2014.
[5] 畑中, 藤田, “システム科学技術のための分散協調最適化とポテンシャルゲーム,” 計測と制御, Vol. 50, No. 1, pp. pp. 49–54, 2012.
[4] 畑中, システム制御情報学会誌国際会議報告 (2009 ACC), システム/制御/情報,Vol. 53, No. 10, 2009.
[3] 飯野, 畑中, 藤田, “センサネットワークと制御理論,” 計測と制御, Vol. 47, No. 8, pp.649–656, 2008.
[2] 畑中, 鷹羽, “不確かな拘束システムに対する確率的出力許容集合の構成,” システム/制御/情報,Vol. 51, No. 11, pp. 499–505, 2007.
[1] 向井, 畑中, 藤田, “ハイブリッドシステムの制御-IV モデル予測制御,” システム/制御/情報,Vol. 51, No. 11, pp.512–519, 2007.

Journal Article

[75] J. Yamauchi, M. Saito, M. Omainska, T. Hatanaka, and M. Fujita, “Cooperative Visual Pursuit Control with Learning of Target Motion via Distributed Gaussian Processes under Varying Visibility,” SICE Journal of Control, Measurement, and System Integration, to be published, 2023.
[74] P. Chanfreut, J.M. Maestre, T. Hatanaka, and E.F. Camacho, “Fast Clustering for Multi-agent Model Predictive Control,” IEEE Transactions on Control of Network Systems, to be published, 2022.
[73] Z. Lu, S. Yamashita, J. Yamauchi, and T. Hatanaka, “Distributed Online Assignment of Charging Stations in Persistent Coverage Control Tasks Based on LP Relaxation and ADMM,” SICE Journal of Control, Measurement, and System Integration, to appear, 2022.
[72] 中山, 種村, 千田, 東, 畑中, “人間とビークル群の協調制御系における制御性能を考慮したデータ駆動型グラフ構造探索,” 第 9 回制御部門マルチシンポジウム特集号, 計測自動制御学会論文集, vol. 59, no. 3, to appear, 2023.
[71] T. Oshima, S. Yamashita, J. Yamauchi, T. Ibuki, M. Seto, and T. Hatanaka, “Loop-shaped Distributed Learning of an Object with Data-independent Performance Certificates,” Special Issue on Control Technology for Networked and Distributed Robotics, Advanced Robotics, to be published, 2023.
[70] T. Hatanaka, J. Yamauchi, M. Fujita, and H. Handa, “Contemporary Issues and Advances in Human-Robot Collaborations,” Cyber-Physical-Human Systems: Fundamentals and Applications, A. Annaswamy, P.P. Khargonekar, F. Lamnabhi-Lagarrigue, and S.K. Spurgeon (eds.), IEEE Press Series on Technology Management, Innovation, and Leadership, Wiley, to be published, 2023.
[69] 山内, 足立, 中山, 畑中, 藤田, “制御バリア関数に基づくロボットの安全性を考慮した球面上での持続的被覆制御,” 電気学会論文誌 C, vol. 142, no. 12, to appear, 2022.
[68] 山下, 土屋, 畑中, “一般化主双対勾配法と制御バリア関数に基づく実時間照明最適化,” 計測自動制御学会論文集, Vol. 58, No. 10, pp. 481–490, 2022.
[67] T. Shimizu, S. Yamashita, T. Hatanaka, K. Uto, M. Mammarella, and F. Dabbene, “Angle-aware Coverage Control for 3D Map Reconstruction with Drone Networks,” IEEE Control Systems Letters, Vol. 6, pp. 1831–1836, 2022.
[66] 山下, 入舟, 畑中, 和佐, 平田, 内田, “同調バイアスを有する集団避難行動のモデル化と受動性に基づくナッジ設計,” 計測自動制御学会論文集, Vol. 58, No. 3, pp. 120–128, 2021.
[65] H. Dan, T. Hatanaka, J. Yamauchi, T. Shimizu, and M. Fujita, “Persistent Object Search and Surveillance Control with Safety Certificates for Drone Networks Based on Control Barrier Functions,” Frontiers in Robotics and AI, section Robotic Control Systems, Vol. 8, pp. 333–345, 2021.

[64] 村尾, 小塩, 河合, 山内, 畑中, 藤田, “受動性に基づく人間–剛体ネットワークの動的協調制御,” 電気学会論文誌 C, Vol. 141, No. 11, pp. 1165–1174, 2021.
[63] M. Omainska, J. Yamauchi, T. Beckers, T. Hatanaka, S. Hirche, and M. Fujita, “Gaussian Process-Based Visual Pursuit Control with Unknown Target Motion Learning in Three Dimensions,” SICE Journal of Control, Measurement, and System Integration, pp. 116–127, 2021.
[62] M. Yamashita, N. Hayashi, T. Hatanaka, and S. Takai, “Logarithmic Regret for Distributed Online Subgradient Method over Unbalanced Directed Networks,” IEICE Transactions, Vol.E104-A, No.08, pp.1019–1026, 2021.
[61] N. Tasaka, S. Satoh, T. Hatanaka and K. Yamada, “Stochastic Stabilization of the Rigid Body Motion of A Spacecraft on $SE(3)$,” International Journal of Control, Vol. 94, No. 5, pp. 1166–1173, 2021.
[60] 山内, 玄長, 舩田, 畑中, 藤田, “情報信頼度とエネルギー管理を考慮した視野重複を保証する持続的視覚被覆制御,” 電気学会論文誌 C, Vol. 141 No. 3, pp. 417–425, 2021.
[59] S. Yamashita, M. Li, and T. Hatanaka, “Robustification of Continuous-Time ADMM against Communication Delays under Non-Strict Convexity: A Passivity-Based Approach,” SICE Journal of Control, Measurement, and System Integration, Vol. 13, No. 6, pp. 299–305, 2020.
[58] T. Hatanaka, R. Funada and M. Fujita, “Visual Surveillance of Human Activities via Gradient-based Coverage Control on Matrix Manifolds,” IEEE Transactions on Control Systems Technology, Vol. 28, No. 6, pp. 2220–2234, 2020.
[57] T. Miyano, S. Yamashita, T. Hatanaka, K. Shibata, T. Jimbo, and M. Fujita, “Continuous-time Optimization Dynamics Mirroring ADMM Architecture and Passivity-Based Robustification against Delays,” IEEE Transactions on Control of Network Systems, vol. 7, no. 3, pp. 1296--1307, 2020.
[56] 山内, 原田, 畑中, 藤田, “ネットワーク化視覚運動オブザーバに基づく 3 次元空間内での協調追尾制御,” 計測自動制御学会論文集, vol. 56, no. 7, pp. 386–393, 2020.
[55] 檀，岡本，和佐，畑中，向井，飯野，“実時間フィードバックおよび信号最適化機能を有する交通流シミュレーション環境の構築と検証,” 計測自動制御学会論文集, vol. 56, no. 7, pp. 379–385, 2020 (in Japanese).
[54] M. Li, S. Yamashita, T. Hatanaka, and G. Chesi, “Smooth Dynamics for Distributed Constrained Optimization With Delays,” IEEE Control Systems Letters, vol. 4, no. 3, pp. 626-631, 2020.
[53] T. Hatanaka, T. Ikawa and N. Li, “A Passivity-Based Design of Cyber-Physical Building HVAC Energy Management Systems Integrating Optimization and Physical Dynamics,” Economically-enabled Energy Management: Interplay between Control Engineering and Economics, T. Hatanaka, Y. Wasa and K. Uchida(eds.), Springer-Verlag, pp. 309–341, 2020.
[52] 檀，岡本，畑中，向井，飯野，“マクロ交通流モデルに基づくサイバーフィジカル最適信号機制御とミクロ交通シミュレータを用いた検証,” 計測自動制御学会論文集, vol. 56, no. 3, pp. 106–115, 2020. **(2021 年度計測自動制御学会論文集論文賞)**
[51] S. Yamashita, T. Hatanaka, J. Yamauchi, and M. Fujita, “Passivity-Based Generalization of Primal-Dual Dynamics for Non-Strictly Convex Cost Functions,” Automatica, vol. 112, no. 2, 108712, 2020.
[50] 山内，土井，伊吹，畑中，藤田, “受動性に基づく 3 次元空間内での外乱を考慮した剛体運動同期制御,” 計測自動制御学会論文集, Vol. 55, No. 12, pp. 808–815, 2019.
[49] A.W. Farras, T. Hatanaka, T.W. Nguyen, R. Funada, J. Yamauchi and M. Fujita, “Distributed Dynamic Reference Governor for Constrained Semi-Autonomous Robotic Swarms with Communication Delays and Experimental Verification,” SICE Journal of Control, Measurement, and System Integration, Vol. 12, No. 6, pp. 237–245, 2019.
[48] 遠藤，鈴木，白石，畑中，福田，藤田，“JIT 予測モデル融合型データセンタ空調制御システムの開発と検証” 計測自動制御学会論文集, Vol. 55, No. 10, pp. 625–634, 2019.
[47] Y. Kusunoki, N. Hayashi, T. Hatanaka and K. Tatsumi, “Adaptive Stepsize Rule for Consensus Optimization by Supervisory Control Architecture,” Transactions of the Institute of Systems, Control and Information Engineers, Vol. 32, No. 9, pp. 338–348, 2019.
[46] 吉田，井上，畑中, “需要家の嗜好を取り入れた地域エネルギー管理—最適化をループに含んだ制御系の解析と設計,” システム制御情報学会論文誌, Vol. 32, No. 7, pp. 275–283, 2019.

[45] K. Yoshida, M. Inoue, and T. Hatanaka, “Instant MPC for Linear Systems and Dissipativity-Based Stability Analysis,” IEEE Control Systems Letters, Vol. 3, No. 4, pp. 811–816, 2019.
[44] 宮野，山下，畑中，柴田，神保，藤田, “連続時間 ADMM の提案と受動性に基づく収束性解析,” 計測自動制御学会論文集, Vol. 55, No. 4, pp. 286–293, 2019. **(2020 年度計測自動制御学会論文集論文賞・武田賞)**
[43] 遠藤, 石倉, 畑中, 児玉, 鈴木, 福田, 藤田, “ICT 機器連携システムを利用したデータセンタ空調機の実時間最適化,” 計測自動制御学会論文集, Vol. 55, No. 2, pp. 118–126, 2019.
[42] T. Hatanaka, N. Chopra, T. Ishizaki and N. Li, “Passivity-Based Distributed Optimization with Communication Delays Using PI Consensus Algorithm,” IEEE Transactions on Automatic Control, Vol. 63, No. 12, pp. 4421–4428, 2018.
[41] 岡本，手塚，向井，畑中，飯野，滑川, “各車両の運動を考慮したミクロ交通流モデルに基づくモデル予測型信号機制御の実行可能性および性能解析,” 計測自動制御学会論文集, Vol. 54, No. 12, pp. 849–856, 2018.
[40] H. Dan, T. Hatanaka and H. Shim, “A Modularized Design for Output Synchronization of LTI Dynamical Networks with Communication Delays,” SICE Journal of Control, Measurement, and System Integration, Vol. 11, No. 6, pp. 495–501, 2018.
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