

# Junya Yamauchi

Assistant Professor

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## Academic Employment

Assistant Professor, Department of Systems and Control Engineering, Tokyo Institute of Technology,  
Apr. 20018–present

## Education

Dr. Eng., Department of Systems and Control Engineering, Tokyo Institute of Technology, March, 2018.

M. Eng., Department of Mechanical and Control Engineering, Tokyo Institute of Technology, March, 2015.

B. Eng., Department of Mechanical and Aerospace Engineering, Nagoya University, March, 2013

## Research Interests

Autonomy of Cyber-Physical Systems, Vision-based estimation and control

## Teaching

**2019** 工学リテラシー

**2018, 2019** システム創造設計

**2018, 2019** システム創造プロジェクト

## Awards

[9] 平成 30 年度海外大学重点校への教員派遣, 2018

[8] 平成 29 年度公益財団法人三豊科学技術振興協会国際交流助成, “Passivity-Based Control of Human-Robotic Networks with Inter-Robot Communication Delays and Experimental Verifications,” 2017

[7] SICE 第 3 回 制御部門マルチシンポジウム学生ポスターセッション優秀発表賞, “受動性に基づく人間-ロボティックネットワークによる協調制御と人間受動性の解析,” 2016

[6] 10th ASCC 2015 Best Paper Prize Award “Stochastic Performance Analysis of Visual Motion Observer and Experimental Verifications ”

[5] 平成 27 年度公益財団法人三豊科学技術振興協会国際交流助成 “Stochastic Performance Analysis of Visual Motion Observer and Experimental Verification,” 2015

## Journal Articles

[12] 山内淳矢, 玄長琢磨, 船田陸, 畑中健志, 藤田政之, TBA, under preparation, 2019

[11] 山内淳矢, 原田裕平, 畑中健志, 藤田政之, “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,” under preparation, 2019

[10] R. Funada, X. Cai, G. Notomista, M.W.S. Atman, J. Yamauchi, M. Fujita and M. Egerstedt, “Coordination of Robot Teams Over Long Distances From Georgia Tech to Tokyo Tech and Back; An 11,000km Multi-Robot Experiment,” IEEE Control Systems Magazine, under revision, 2019

[9] T. Ibuki, S. Wilson, J. Yamauchi, M. Fujita and M. Egerstedt, “Optimization Based Distributed Flocking Control for Multiple Rigid Bodies,” IEEE Robotics and Automation Letters, under revision, 2019

[8] 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, to appear, 2019 (DOI: 10.1016/j.automatica.2019.108712)

[7] 山内淳矢, 土井護, 伊吹竜也, 畑中健志, 藤田政之, “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, to appear, 2019

[6] 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 (DOI: 10.9746/jcmsi.12.237)

[5] M.W.S. Atman, T. Hatanaka, Z. Qu, N. Chopra, J. Yamauchi, M. Fujita, “Human-enabled Motion Synchronization for Semi-autonomous Robotic Swarm with A Passivity-short Human Operator,” Special Issue on Human-Centered Robotics, International Journal of Intelligent Robotics and Applications, Vol. 2, No. 2, pp. 235–251, 2018 (DOI: 10.1007/s41315-018-0056-8)

[4] 山内淳矢, M.W.S. Atman, 畑中健志, 藤田政之, “ロボット間の通信遅れを考慮した人間-ロボティクネットワークの協調制御：受動性アプローチ,” 計測自動制御学会論文集, Vol. 53, No. 12, pp. 663–670, 2017 (DOI:10.9746/sicetr.53.663)

[3] 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. 15, No. 2, pp. 14–18, 2017 (DOI: 10.1115/1.2017-Jun-6)

[2] T. Hatanaka, N. Chopra, J. Yamauchi and M. Fujita, “A Passivity-Based Approach to Human-Swarm Collaborations and Passivity Analysis of Human Operators,” Trends in Control and Decision-Making for Human-Robot Collaboration Systems, Y. Wang and F. Zhang (eds.), Springer-Verlag, pp. 325–355, 2017 (DOI:10.1007/978-3-319-40533-914)

[1] 山内淳矢, 佐藤訓志, 畑中健志, 藤田政之, “視覚運動オブザーバの確率的推定性能解析,” システム制御情報学会論文誌, Vol. 27, No. 11, pp. 443–451, 2014 (DOI:10.5687/iscie.27.443)

## Refereed Conference Publications

- [11] R. Funada, M. Santos, T. Gencho, J. Yamauchi, M. Fujita and M. Egerstedt, "Visual Coverage Maintenance for Quadcopters Using Nonsmooth Barrier Functions," Proc. 2020 International Conference on Robotics and Automation (ICRA), submitted, 2019
- [10] T. Ibuki, S. Wilson, J. Yamauchi, M. Fujita and M. Egerstedt, "Optimization Based Distributed Flocking Control for Multiple Rigid Bodies," Proc. 2020 International Conference on Robotics and Automation (ICRA), submitted, 2019
- [9] A.W. Farras, J. Yamauchi, T. Hatanaka and M. Fujita, "Safe Cooperative Control of Human Robotic Network Teaming with Control Barrier Function," Proc. the 2020 SICE International Symposium on Control Systems (ISCS), submitted, 2019
- [8] G. Notomista, X. Cai, J. Yamauchi and M. Egerstedt, "Passivity-Based Decentralized Control of Multi-Robot Systems with Delays Using Control Barrier Functions," Proc. of 2019 International Symposium on Multi-Robot and Multi-Agent Systems (MRS), USA, Aug. 22–23, FrPP6T1.1, 2019
- [7] R. Funada, M. Santos, J. Yamauchi, T. Hatanaka, M. Fujita and M. Egerstedt, "Visual Coverage Control for Teams of Quadcopters via Control Barrier Functions," Proc. of 2019 International Conference on Robotics and Automation (ICRA), May. 20–24, Montreal, Canada, pp. 3010–3016, 2019
- [6] M. W. S. Atman, K. Noda, R. Funada, J. Yamauchi, T. Hatanaka and M. Fujita, "On Passivity-Shortage of Human Operators for A Class of Semi-autonomous Robotic Swarms," Proc. of 2nd IFAC Conference on Cyber-Physical Human Systems, Dec. 14–15, Florida, USA, pp. 21–27, 2018
- [5] T. Hatanaka, A. W. Farras, J. Yamauchi and M. Fujita "A passivity-based approach to distributed reference management for constrained semi-autonomous robotic swarms with communication delays," Proc. of SICE Annual Conference 2018, Sep. 11–14, Nara, Japan, pp. 563–566, 2018
- [4] M.W.S. Atman, J. Hay, J. Yamauchi, T. Hatanaka and M. Fujita, "Two Variations of Passivity-Short-Based Semi-autonomous Robotic Swarms and Their Experimental Analysis," Proc. of SICE International Symposium on Control Systems (ISCS) 2018, Japan, pp. 12–19, 2018
- [3] J. Yamauchi, K. Kizaki, T. Ibuki, S. Satoh, T. Hatanaka and M. Fujita "Performance Analysis of Visual Feedback Leader-Following Pose Synchronization with Stochastic Uncertain Leader in Three Dimensions," Proc. 1st IEEE Conference on Control Technology and Applications, pp. 349–354, US, 2017. (DOI: 10.1109/CCTA.2017.8062487)
- [2] J. Yamauchi, M.W.S. Atman, T. Hatanaka, N. Chopra and M. Fujita, "Passivity-Based Control of Human-Robotic Networks with Inter-Robot Communication Delays and Experimental Verification," Proc. 2017 IEEE International Conference on Advanced Intelligent Mechatronics, pp. 628–633, Germany, 2017 (DOI: 10.1109/AIM.2017.8014087)
- [1] J. Yamauchi, S. Nakano, S. Satoh, T. Hatanaka and M. Fujita, "Stochastic Performance Analysis of Visual Motion Observer and Experimental Verifications," Proc. of 10th Asian Control Conference 2015, pp. 797–802, Kota Kinabalu, Malaysia, May 31–June 3, 2015 (DOI: 10.1109/ASCC.2015.7244515)

## 国内会議発表 (査読無)

- [4] 山内, 2018 年度第 2 回超スマート社会推進フォーラム, 東京, February, 22, 2019
- [3] 山内, 畑中, 藤田, “受動性に基づく人間-ロボティックネットワークによる協調制御と人間受動性の解析,” SICE 第 3 回 制御部門マルチシンポジウム, 愛知, March, 7-10, PS-15, 2016
- [2] 山内, 佐藤, 畑中, 藤田, “確率外乱を受ける対象運動に対する視覚オブザーバの推定性能解析,” SICE 第 1 回 制御部門マルチシンポジウム, 東京, March, 4-7, PS-22, 2014
- [1] 山内, 石川, 藤本, 早川, “相互作用するシステムに対する分散的な故障検出器の設計,” 第 57 回システム制御情報学会研究発表講演会, 神戸, 2013

## 外部資金

### 代表者

- [2] 科学研究費補助金 研究活動スタート支援 (課題番号: 18H05903) 題目: 持続的環境モニタリングに向けた協調自律モバイルセンサネットワークシステムの構築

### 分担者

- [1] 科学研究費補助金 基盤研究 B (分担) (課題番号: 18H01459) 題目: 人とロボット群の協調を実現する相互学習型分散制御システムの構築

## Project

- [3] 広域基礎研究塾 新研究挑戦奨励金, ドローン群による立体構造物の協調点検および点検項目の評価・抽出, 2019
- [2] イノベーションジャパン 2019 大学見本市, "超スマート社会に貢献する 5G・Robot・CPHS", 2019
- [1] 東京工業大学基礎研究機構広域基礎研究室, 2Q, 2019
- [0] 東京工業大学 工学院 統合 IoT 技術グループ

## Seminar

- [6] Passivity-Based Control of Human-Robotic Networks with Inter-Robot Communication Delays, Georgia Institute of Technology, USA, March 13, 2019
- [5] Passivity-Based Cooperative Control of Human-Robotic Network and Human Passivity Analysis, University of Stuttgart, Germany, November 21, 2018

- [4] Passivity-Based Cooperative Control of Human-Robotic Network and Human Passivity Analysis, Otto von Guericke University Magdeburg, Germany, November 13, 2018
- [3] Performance Analysis of Cooperative Visual Feedback Control for Uncertain Target Motion Tracking in 3-Dimensional Space, Technical University of Munich, Germany, September 26, 2018
- [2] Passivity-based Cooperative Control of Human-Robotic Network, Ulm University, Germany, June 27, 2017
- [1] Passivity-based Cooperative Control of Human-Robotic Network, Technical University of Munich, Germany, June 22, 2017