# Research Achievement 業績リスト

## Kenji Kashima 加嶋 健司

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# Contents 目次

Publication 学術論文等	1
International Journal 国際論文誌	1
Domestic Journal 国内論文誌	7
Refereed International Conference 査読付き国際会議	9
Book 原著・編著書	17
Review Articles 総説・学術資料等	18
Awards 受賞歴	19
主な招待講演	20

# Publication 学術論文等

### International Journal 国際論文誌

60. Takuya Ikeda, Tomofumi Ohtsuka, **Kenji Kashima**,

"Matrix Pontryagin principle approach to controllability metrics maximization under sparsity constraints," to appear in *Automatica* 

59. Kaito Ito, Kenji Kashima,

"Maximum entropy optimal density control of discrete-time linear systems and Schrödinger bridges," *IEEE Transactions on Automatic Control*, Vol. **69**, Issue 3, pp. 1536/1551, 2024

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58. Ran Wang, Ye Tien, Kenji Kashima,

"Density estimation based soft actor-critic: deep reinforcement learning for static output feedback control with measurement noise,"

Advanced Robotics, Vol. xx, Issue xx, pp. xxxx/xxxx, 2024

DOI: 10.1080/01691864.2024.2309621

57. Ran Wang, Kenji Kashima,

"Deep reinforcement learning for continuous-time self-triggered control with experimental evaluation," *Advanced Robotics*, Vol. **37**, Issue 16, pp. 1012/1024, 2023

DOI: 10.1080/01691864.2023.2229886

### 56. Ryotaro Shima, Ryuta Moriyasu, Sho Kawaguchi, Kenji Kashima,

"Differentiable sparse optimal control,"

IEEE Control Systems Letters, Vol. 7, pp. 3126/3131, 2023

DOI: 10.1109/LCSYS.2023.3289269

### 55. Kaito Ito, Kenji Kashima,

"Entropic model predictive optimal transport for underactuated linear systems,"

IEEE Control Systems Letters, Vol. 7, pp. 2261/2266, 2023

DOI: 10.1109/LCSYS.2023.3288474

### 54. Tomohito Omori, Kenji Kashima,

"Combinatorial optimization approach to client scheduling for federated learning,"

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#### 53. Selected as Editor's Choice

#### Kaito Ito, **Kenji Kashima**,

"Entropic model predictive optimal transport over dynamical systems,"

Automatica, Vol. 152, 110980, 2023

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### 52. Kaito Ito, Yu Kawano, Kenji Kashima,

"An LMI framework for contraction-based nonlinear control design by derivatives of Gaussian process regression,"

Automatica, Vol. 151, 110928, 2023

DOI: j.automatica.2023.110928

### 51. Kunwoo Lee, Yusuke Umezu, Kaiki Konno, Kenji Kashima,

"Observability Gramian for Bayesian inference in nonlinear systems with its industrial application,"

IEEE Control Systems Letters, Vol. 7, pp. 871/876, 2023

DOI: 10.1109/LCSYS.2022.3227452

### 50. SICE Best Paper Award

### Kaito Ito, Kenji Kashima,

"Kullback-Leibler control for discrete-time nonlinear systems on continuous spaces,"

SICE Journal of Control, Measurement, and System Integration, Vol. 15, Issue 2, pp. 119/129, 2022

DOI: 10.1080/18824889.2022.2095827

### 49. Takuya Ikeda, Kenji Kashima,

"Sparse control node scheduling in networked systems based on approximate controllability metrics,"

IEEE Transactions on Control of Network Systems, Vol. 9, Issue 3, pp. 1166/1177, 2022

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### 48. Takuya Ikeda, Kazunori Sakurama, Kenji Kashima,

"Multiple sparsity constrained control node scheduling with application to rebalancing of mobility networks,"

IEEE Transactions on Automatic Control, Vol. 67, Issue 8, pp. 4314/4321, 2022

DOI: 10.1109/TAC.2021.3115441

### 47. Genki Sugiura, Kaito Ito, Kenji Kashima,

"Bayesian differential privacy for linear dynamical systems,"

IEEE Control Systems Letters, Vol. 6, pp. 869/901, 2022

DOI: 10.1109/LCSYS.2021.3087096

### 46. Ryuta Moriyasu, Taro Ikeda, Sho Kawaguchi, Kenji Kashima,

"Structured Hammerstein-Wiener model learning for model predictive control,"

IEEE Control Systems Letters, Vol. 6, pp. 397/402, 2022

DOI: 10.1109/LCSYS.2021.3077201

### 45. Kaito Ito, Yu Kawano, Kenji Kashima,

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### 44. SICE Best Paper Award, Takeda Prize

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"Stochastic model-based assessment of power systems subject to extreme wind power fluctuation,"

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### 43. Yu Kawano, Kenji Kashima, Ming Cao,

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### 42. Kaito Ito, Takuya Ikeda, Kenji Kashima,

"Sparse optimal stochastic control,"

Automatica, Vol. 125, 109438, 2021

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### 41. Daisuke Iwai\*, Hidetoshi Izawa\*, **Kenji Kashima**\*, Tatsuyuki Ueda, Kosuke Sato, (\* contributed equally)

"Speeded-up focus control of electrically tunable lens by sparse optimization,"

Scientific Reports, 9, 12365, 2019

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### 40. Takuya Ikeda, Masaaki Nagahara, Kenji Kashima,

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#### 39. Takuya Ikeda, Kenji Kashima,

"On sparse optimal control for general linear systems,"

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DOI: 10.1109/TAC.2018.2842145

### 38. Kenji Kashima, Hiroki Aoyama, Yoshito Ohta,

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### 36. Naomi Kuze, Daichi Kominami, Kenji Kashima, Tomoaki Hashimoto, Masayuki Murata,

"Self-organizing control mechanism based on collective decision-making for information uncertainty,"

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35. Naomi Kuze, Daichi Kominami, Kenji Kashima, Tomoaki Hashimoto, Masayuki Murata,

"Hierarchical optimal control method for controlling large-scale self-organizing networks,"

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34. Jun Tsukamoto, Daisuke Iwai, Kenji Kashima,

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33. Yuta Okumura, Kenji Kashima, Yoshito Ohta,

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32. Kenji Kashima,

"Noise response data reveal novel controllability Gramian for nonlinear network dynamics,"

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29. Takayuki Ishizaki, Kenji Kashima, Antoine Girard, Jun-ichi Imura, Luonan Chen, Kazuyuki Aihara,

"Clustered model reduction of positive directed networks,"

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28. Kenji Kashima, Toshiyuki Ogawa, Tatsunari Sakurai,

"Selective pattern formation control: Spatial spectrum consensus and Turing instability approach,"

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27. Takayuki Ishizaki, Henrik Sandberg, Kenji Kashima, Jun-ichi Imura, Kazuyuki Aihara,

"Dissipativity-preserving model reduction for large-scale distributed control systems,"

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26. Masaki Inoue, Jun-ichi Imura, Kenji Kashima, Masayasu Suzuki, Kazuyuki Aihara,

"Absolute instability of Lur'e systems and its application to oscillation analysis of uncertain genetic networks,"

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25. Kenji Kashima, Masakazu Kato, Jun-ichi Imura, Kazuyuki Aihara,

"Probabilistic evaluation of interconnectable capacity for wind power generation,"

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24. Takayuki Ishizaki, Kenji Kashima, Jun-ichi Imura, Kazuyuki Aihara,

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23. Takayuki Ishizaki, Kenji Kashima, Jun-ichi Imura, Atsushi Kato, Hiroshi Morita, Kazuyuki Aihara,

"Distributed parameter modeling and finite-frequency loop-shaping of electromagnetic molding machine,"

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22. Caterina Thomaseth, Patrick Marc Weber, Thomas Hamm, Kenji Kashima, Nicole Radde,

"Modeling sphingomyelin synthase 1 driven reaction at the Golgi apparatus can explain data by inclusion of a positive feedback mechanism,"

Journal of Theoretical Biology, Vol. 337, Issue 11, pp. 174/180, 2013

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21. Kenji Kashima, Yutaka Takahashi, Jun-ichi Imura,

"On the convergence rate of diffusion in the bidirectional Erdös-Rényi networks: an  $H^2$ -norm perspective,"

Physica A, Vol. 392, Issue 21, pp. 5461/5472, 2013

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20. Masaki Inoue, Jun-ichi Imura, Kenji Kashima, Kazuyuki Aihara,

"Robust bifurcation analysis of systems with dynamic uncertainties,"

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19. Kenji Kashima, Reiichiro Kawai,

"On weak approximation of stochastic differential equations through hard bounds by mathematical programming,"

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18. Kenji Kashima, Yasuyuki Kawamura, Jun-ichi Imura,

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17. Kenji Kashima, Reiichiro Kawai,

"A weak approximation of stochastic differential equations with jumps through tempered polynomial optimization,"

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16. Kenji Kashima, Reiichiro Kawai,

"An optimization approach to weak approximation of stochastic differential equations with jumps,"

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15. Jun-ichi Imura, Kenji Kashima, Masami Kusano, Tsukasa Ikeda, Tomohiro Morohoshi,

"Piecewise affine systems approach to control of biological networks,"

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### 14. Kenji Kashima, Jun-ichi Imura,

"Local stability analysis of heterogeneous equilibrium patterns observed in Delta-Notch interaction,"

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### 13. Takayuki Ishizaki, **Kenji Kashima**, Jun-ichi Imura,

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### 11. Ravi Gondhalekar, Jun-ichi Imura, Kenji Kashima,

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### 10. Kazunori Nishio, Kenji Kashima, Jun-ichi Imura,

"Effects of time delay in feedback control of linear quantum systems,"

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#### 9. **Kenji Kashima**, Naoki Yamamoto,

"Control of quantum systems despite feedback delay,"

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#### 8. Kenji Kashima,

"A new expression for the  $H^2$  performance limit based on state-space representation,"

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### 7. Kenji Kashima, Yutaka Yamamoto,

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### 6. Kenji Kashima, Yutaka Yamamoto,

"On standard  $H^{\infty}$  control problems for systems with infinitely many unstable poles,"

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### 5. **Kenji Kashima**, Yutaka Yamamoto, Hitay Özbay,

"Parameterization of suboptimal solutions of the Nehari problem for infinite-dimensional systems,"

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### 4. Kenji Kashima, Yutaka Yamamoto,

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3. Kenji Kashima, Hitay Özbay, Yutaka Yamamoto,

"A Hamiltonian-based solution to the mixed sensitivity optimization problem for stable pseudorational plants," *Systems and Control Letters*, Vol. **54**, Issue 11, pp. 1063/1068, 2005

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### Domestic Journal 国内論文誌

22. 森安 竜大, 橋本 俊哉, 日下部 信一, 加嶋 健司,

"軌道の位相的性質を保証する非線形動的システム学習"

日本ロボット学会誌, Vol. 39, Issue 3, pp. 259/262, 2021

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21. 伊藤海斗,林輝,加嶋健司,加藤政一,

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20. 南 裕樹, 加嶋健司,

"システムの直列分解に基づく動的量子化器設計,"

計測自動制御学会論文誌, Vol. 52, Issue 1, pp. 46/51, 2016

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19. 塚本 潤, 岩井 大輔, 加嶋 健司,

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16. 亀本 大貴, 橋本 智昭, 加嶋 健司, 大塚 敏之,

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#### 15. 2014 年度 システム制御情報学会 学会賞 論文賞

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### 14. 2014 年度 システム制御情報学会 学会賞 産業技術賞

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12. 石崎 孝幸, 加嶋 健司, 井村 順一, 合原 一幸,

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"大規模テプリッツ型方程式に対する定常反復法の制御理論的考察と磁場解析への応用."

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計測自動制御学会論文誌, Vol. 46, Issue 12, pp. 774/782, 2010

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- 2022. 計測自動制御学会 論文賞 武田賞
- 2021. 計測自動制御学会制御部門 マルチシンポジウム賞 基礎分野
- 2019. 2019 IEEE CSS Roberto Tempo Best CDC Paper Award
- 2016. 計測自動制御学会 論文賞 武田賞
- 2015. 計測自動制御学会 論文賞
- 2014. システム制御情報学会 学会賞 産業技術賞
- 2014. システム制御情報学会 学会賞 論文賞
- 2013. 計測自動制御学会 制御部門大会賞
- 2012. システム制御情報学会 学会賞 論文賞
- ・ 2012. 計測自動制御学会 制御部門 パイオニア賞 大規模系・分布定数系のシステム制御理論とその応用に関する一連の研究に対して
- 2011. SICE Annual Conference International Award
- 2010. 計測自動制御学会 論文賞
- 2010. Humboldt Research Fellowship for Experienced Researchers Alexander von Humboldt Foundation (Germany)
- 2008. 計測自動制御学会 制御部門大会賞
- その他
  - 2012 大阪大学総長奨励賞
  - 2011 大阪大学総長による表彰
  - 2007システム制御情報学会学会賞奨励賞
  - 2006 計測自動制御学会 学術奨励賞研究奨励賞

### 主な招待講演

### 3. Kenji Kashima,

"Guided Self-Organization in Engineering and Science,"

Keynote Speech by 2016 SICE Takeda Award Winner, Tsukuba, Japan, 2016

### 2. Kenji Kashima,

"Selective Pattern Formation of Reaction-Diffusion Systems,"

9th Workshop on Control of Distributed Parameter Systems, Beijing, China, 2015

### 1. Kenji Kashima,

"Smith-Predictor type Structure for a Class of Infinite-Dimensional Systems: Optimal Control and Performance Limitation Formula."

Semi-Plenary Talk in 19th. Int'l Symp. on Mathematical Theory of Networks and Systems (MTNS), Budapest, Hungary, 2010

#### 9. 加嶋 健司.

"機械学習と調和する制御理論,"

第4回 SICE ポストコロナ未来社会ワークショップ人間行動と社会のモデリング, 2020

### 8. 加嶋 健司、

"システム制御理論と機械学習,"

情報論的学習理論と機械学習研究会 (IBISML) 第 41 回研究会, 2020

### 7. 加嶋 健司,

"機械学習と調和する制御理論,"

自動車技術会・自動車制御とモデル部門委員会「サイバーフィジカルシステムと人間社会・AI」, 2020

### 6. 加嶋 健司,

"大規模ネットワークの可制御性,"

電子情報通信学会 2017 年ソサイエティ大会, 2017

### 5. 加嶋 健司、

"モデル低次元化の基礎理論と研究動向,"

第 59 回システム制御情報学会研究発表講演会,チュートリアル講演,大阪,2015

### 4. 加嶋 健司.

"線形系の合意形成と反応拡散系におけるパターン形成,"

第56回システム制御情報学会研究発表講演会,招待講演,京都,2012

### 3. 加嶋 健司,

"動的システムの空間構造:均質性とスケーラビリティ"

第12回制御部門大会、パイオニア賞受賞記念講演、奈良、2012

### 2. 加嶋 健司,

"量子力学系のフィルタリングと制御,"

第2回制御理論ワーキングセミナー(計測自動制御学会中部支部主催),名古屋,2008

### 1. 加嶋 健司,

"量子力学系のフィルタリングと制御,"

第52回システム制御情報学会研究発表講演会,招待講演,京都,2008