

# Masaaki Nagahara *Full Professor, The University of Kitakyushu, Japan*

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## Summary

Prof. Masaaki Nagahara received the bachelor's degree in engineering from Kobe University in 1998, and the master's degree and the Doctoral degree in informatics from Kyoto University in 2000 and 2003, respectively, under the supervision of Prof. Yutaka Yamamoto. He is currently a Full Professor with the Institute of Environmental Science and Technology, The University of Kitakyushu. He has been also a Visiting Professor with IIT Bombay since 2016.

He received two remarkable international awards: George S. Axelby Outstanding Paper Award in 2018 and Transition to Practice Award in 2012, from the IEEE Control Systems Society. Also, he received many awards from Japanese research societies such as Young Authors Award in 1999, Best Paper Award in 2012, and the Best Book Authors Award in 2016 from SICE, the Best Tutorial Paper Award from the IEICE Communications Society in 2014.

His research interests include systems and con-

trol theory, machine learning, signal processing, and their applications to drones, autonomous vehicles, and energy management systems. He is author or co-author of more than 100 publications in top journals (e.g. IEEE Trans. on Automatic Control, IEEE Trans. on Signal Processing, Automatica, etc) and top conferences (e.g. IEEE CDC, IEEE ICASSP, IFAC WC, etc). He has given more than 40 Plenary/Invited/Tutorial lectures. He successfully conducted research teams as the principal investigator with funded grants mainly from Japanese government (MEXT). He has 5 granted patents by the USPTO for audio/image processing systems and power systems.

He is a senior member of the IEEE. He has been serving as AE for Conference Editorial Board, IEEE Control Systems Society (2013–), AE of SICE Journal of Control, Measurement, and System Integration (2015–), and AE of Asian Journal of Control (2019–), to name a few.

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## Main Fields of Interest

Systems and Control Theory and Applications, Machine Learning and Control, Signal Processing, Autonomous Drones and Vehicles, Energy Management Systems

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## Education

- March 2003: **PhD**, *Informatics, Kyoto University, Japan*

Thesis Title: Multirate digital signal processing via sampled-data  $H^\infty$  optimization

Advisor: Prof. Yutaka Yamamoto

- March 2000: **Master Degree**, *Informatics, Kyoto University, Japan*
- March 1998: **Bachelor Degree**, *Engineering, Kobe University, Japan*

## Current and Previous Academic Positions

- April 2016–present: **Full Professor**

Institute of Environmental Science and Technology, The University of Kitakyushu, Japan

- October 2016–present: **Visiting Professor**

Systems & Control Engineering (SysCon), Indian Institute of Technology (IIT) Bombay, India

- October 2012–March 2016: **Senior Lecturer**

Graduate School of Informatics, Kyoto University, Japan

- April 2007–October 2012: **Assistant Professor**

Graduate School of Informatics, Kyoto University, Japan

- April 2005–August 2012: **Adjunct Lecturer**

School of Engineering Science, Osaka University, Japan

- April 2003–March 2007: **Associate Researcher**

Graduate School of Informatics, Kyoto University, Japan

## Short-term Positions

- As a visiting researcher, I have visited **Indian Institute of Technology Bombay** (India), **Indian Institute of Technology Hyderabad** (India), **Indian Institute of Technology Kharagpur** (India), **Paderborn University** (Germany), **Technical University of Berlin** (Germany), **University of Newcastle** (Australia), **Aalborg University** (Denmark), and **Texas Tech University** (USA).

## Awards

- **George S. Axelby Outstanding Paper Award** in 2018 from the IEEE Control Systems Society for the following published paper:
  - M. Nagahara, D. E. Quevedo, and D. Nesic, Maximum Hands-off Control: A Paradigm of Control Effort Minimization, *IEEE Transactions on Automatic Control*, Vol. 61, No. 3, pp. 735-747, 2016.

This is an international award, which is annually presented to the best paper (in the two recent years) in the leading journal *IEEE Transactions on Automatic Control*.

- **Transition to Practice Award** in 2012 from the IEEE Control Systems Society for the introduction and development of the sound-processing technology incorporated in a large number of LSI chips by SANYO Semiconductor. This is an international award, which is annually presented to a distinguished contributor to the transition of control and systems theory to practical, industrial, or commercial systems.
- **Best Book Authors Award** in 2016 from the SICE for the published book
  - S. Azuma, M. Nagahara, H. Ishii, N. Hayashi, K. Sakurama, and T. Hatanaka, *Control of Multi-agent Systems*, Corona Publishing, 2015.
- **Best Tutorial Paper Award** in 2014 from the IEICE Communications Society for the quality of the following tutorial paper:

- K. Hayashi, M. Nagahara, and T. Tanaka, A User’s Guide to Compressed Sensing for Communications Systems, *IEICE Trans. on Communications*, Vol. E96-B, No. 3, pp. 685-712, Mar. 2013.

This award is annually presented to the best-quality tutorial paper published in the journal.

- **Best Paper Award** in 2012 from the SICE for the quality of a research paper, “ $H^\infty$  design of periodically nonuniform interpolation and decimation for non-band-limited signals,” published in *SICE Journal of Control, Measurement, and System Integration*. This award is annually presented to high-quality papers published in the journal.
- **Senior member of IEEE** in 2014 presented by the IEEE. Senior member is the highest grade for which IEEE members can apply.
- **Outstanding Reviewer** from *Automatica* in 2015.
- **Young Authors Award** from SICE in 1999.

## Collaborators from Outside Japan

- **Australia:** Prof. Dragan Nešić (The University of Melbourne), Prof. Brian D. O. Anderson (Australian National University)
- **India:** Prof. Dabasish Chatterjee (Indian Institute of Technology Bombay), Prof. Srikant Sukumar (Indian Institute of Technology Bombay), Prof. D. Manjunath (Indian Institute of Technology Bombay), Prof. Mathukumalli Vidyasagar (Indian Institute of Technology Hyderabad)
- **United States:** Prof. Pramod P. Khargonekar (University of California Irvine), Prof. Clyde F. Martin (Texas Tech University),
- **Europe:** Prof. Daniel E. Quevedo (University of Paderborn, Germany), Prof. Jan Østergaard (Aalborg University, Denmark)

## Collaboration with Industry

- **Toyota**, topic: engine control (2017–2018)
- **Kitayushu Power**, topic: energy management (2017)
- **Fujitsu Laboratories**, Japan, topic: machine learning (2016–2018)
- **Panasonic**, topic: power systems (2008–2016)

## Publications

### Books (written in Japanese)

1. M. Nagahara, K. Okano, M. Ogura, and M. Wakaiki, *Networked Control*, Corona Publishing, 2019. ISBN 978-4-339-03227-7
2. M. Kawata, S. Azuma, H. Ichikawa, T. Urakubo, T. Ohtsuka, T. Kai, S. Kunitatsu, K. Sawada, M. Nagahara, and H. Minami, *Control Engineering Learned with Inverted Pendulums*, Morikita Publishing, 2017. ISBN 978-4627792210

3. **M. Nagahara**, *Sparse Modeling*, Corona Publishing, 2016. ISBN 978-4-339-03222-2
4. S. Azuma, **M. Nagahara**, H. Ishii, N. Hayashi, K. Sakurama, and T. Hatanaka, *Control of Multi-agent Systems*, Corona Publishing, 2015. ISBN 978-4-339-03322-9

### Book Chapters

1. Y. Yamamoto and **M. Nagahara**, Digital Control, *Wiley Encyclopedia of Electrical and Electronics Engineering*, J. G. Webster (Ed.), Wiley, Feb. 2018. Online ISBN: 9780471346081
2. K. Yamamoto, Y. Yamamoto, and **M. Nagahara**, Hypertracking Beyond the Nyquist Frequency, *Emerging Applications of Control and Systems Theory*, A Festschrift in Honor of M. Vidyasagar, pp. 369-379, Springer, 2018. ISBN 978-3-319-67068-3
3. **M. Nagahara**, K. Hamaguchi, and Y. Yamamoto, Active noise control with sampled-data filtered-x adaptive algorithm, *Mathematical System Theory*, A Festschrift in Honor of Uwe Helmke on the Occasion of his Sixtieth Birthday, pp. 275-290, CreateSpace, 2013. ISBN 978-1470044008
4. **M. Nagahara**, Min-max design of FIR digital filters by semidefinite programming, *Applications of Digital Signal Processing*, pp. 193-210, InTech, Nov. 2011. ISBN 978-953-307-406-1
5. **M. Nagahara**, YY filter — a paradigm of digital signal processing, *Perspectives in Mathematical System Theory, Control, and Signal Processing*, pp. 331-340, Springer, 2010. ISBN 978-3-540-93917-7
6. **M. Nagahara**, Sound source separation, Audio signal compression, Synthesizer, Digital signal processing, *Encyclopedia of Sound*, Maruzen, 2006. (in Japanese) ISBN 978-4621076606
7. Y. Yamamoto and **M. Nagahara**, Digital filter design via sampled-data control theory, *Control and Modeling of Complex Systems: Cybernetics in the 21st Century*, pp. 31-43, Birkhauser, Dec. 2002. ISBN 978-1-4612-0023-9

### Journal Articles

1. **M. Nagahara**, D. Chatterjee, N. Challapalli, and M. Vidyasagar, CLOT norm minimization for continuous hands-off control, *Automatica*, 2019 (to appear)
2. T. Iwata, Y. Oishi, and **M. Nagahara**, Realization of sparse control using the model predictive control scheme, *SICE Transactions*, Vol. 56, No. 3, 2020 (in Japanese)
3. K. Nakashima, T. Matsuda, **M. Nagahara**, and T. Takine, Multihop TDMA-based wireless networked control systems robust against bursty packet losses: a two-path approach, *IEICE Transactions on Communications*, 2019
4. H. Sasahara, **M. Nagahara**, K. Hayashi, and Y. Yamamoto, Self-Interference Suppression based on Sampled-Data  $H^\infty$  Control for Baseband Signal Subspaces, *SICE Journal of Control, Measurement, and System Integration*, Vol. 12, No. 5, pp. 182-189, Sept 2019
5. T. Ikeda, **M. Nagahara**, and K. Kashima, Maximum Hands-off Distributed Control for Consensus of Multi-Agent Systems with Sampled-data State Observation, *IEEE Transactions on Control of Network Systems*, Vol. 6, No. 2, pp. 852-862, June 2019
6. T. Ikeda and **M. Nagahara**, Time-Optimal Hands-off Control for Linear Time-Invariant Systems, *Automatica*, Vol. 99, pp. 54-58, 2019

7. N. Hayashi and **M. Nagahara**, Distributed Proximal Minimization Algorithm for Constrained Convex Optimization over Strongly Connected Networks, *IEICE Transactions on Fundamentals of Electronics, Communications and Computer Sciences*, Vol. E102-A, No. 02, Feb. 2019.
8. S. Ohno, Y. Ishihara, and **M. Nagahara**, Min-Max Design of Error Feedback Quantizers without Overloading, *IEEE Transactions on Circuits and Systems I: Regular Papers*, Vol. 65, No. 4, pp. 1395-1405, Apr. 2018
9. T. Ikeda and **M. Nagahara**, Discrete-valued Model Predictive Control using Sum-of-Absolute-Values Optimization, *Asian Journal of Control*, Vol. 20, No. 1, pp. 196-206, 2018
10. S. Ohno, T. Shiraki, M. R. Tariq, and **M. Nagahara**, Mean Squared Error Analysis of Quantizers with Error Feedback, *IEEE Transactions on Signal Processing*, Vol. 65, No. 22, pp. 5970-5981, Nov. 2017
11. H. Sasahara, K. Hayashi, and **M. Nagahara**, Multiuser Detection based on MAP Estimation with Sum-of-Absolute-Values Relaxation, *IEEE Transactions on Signal Processing*, vol. 65, no. 21, pp. 5621-5634, Nov. 2017.
12. T. Ikeda, **M. Nagahara**, and S. Ono, Discrete-Valued Control of Linear Time-Invariant Systems by Sum-of-Absolute-Values Optimization, *IEEE Transactions on Automatic Control*, Vol. 62, No. 6, pp. 2750-2763, June 2017.
13. N. Hayashi, **M. Nagahara**, and Y. Yamamoto, Robust AC Voltage Regulation of Microgrids in Islanded Mode with Sinusoidal Internal Model, *SICE Journal of Control, Measurement, and System Integration*, Vol. 10, No. 2 p. 62-69, 2017.
14. H. Sasahara, K. Hayashi and **M. Nagahara**, Symbol Detection for Faster-Than-Nyquist Signaling by Sum-of-Absolute-Values Optimization, *IEEE Signal Processing Letters*, vol. 23, no. 12, pp. 1853-1857, Dec. 2016.
15. **M. Nagahara**, J. Ostergaard, D. E. Quevedo, Discrete-time hands-off control by sparse optimization, *EURASIP Journal on Advances in Signal Processing*, 2016:76, Dec. 2016.
16. D. Chatterjee, **M. Nagahara**, D. E. Quevedo, and K. S. M. Rao, Characterization of maximum hands-off control, *Systems & Control Letters*, vol. 94, pp. 31-36, Aug. 2016.
17. **M. Nagahara** and Y. Yamamoto, Digital repetitive controller design via sampled-data delayed signal reconstruction, *Automatica*, Vol. 65, pp. 203-209, 2016.
18. T. Ikeda and **M. Nagahara**, Value function in maximum hands-off control for linear systems, *Automatica*, vol. 64, pp. 190-195, Feb. 2016
19. **M. Nagahara**, D. E. Quevedo, and D. Nesic, Maximum hands-off control: a paradigm of control effort minimization, *IEEE Transactions on Automatic Control* Vol. 61, No. 3, pp. 735-747, 2016.
20. **M. Nagahara**, Discrete Signal Reconstruction by Sum of Absolute Values, *IEEE Signal Processing Letters*, Vol. 22, no. 10, pp. 1575-1579, Oct. 2015.
21. H. Sasahara, **M. Nagahara**, K. Hayashi, and Y. Yamamoto, Digital Cancellation of Self-Interference for Single-Frequency Full-Duplex Relay Stations via Sampled-Data Control, *SICE Journal of Control, Measurement, and System Integration*, Vol. 8, No. 5, pp. 321-327, 2015.
22. **M. Nagahara** and C. F. Martin,  $L^1$  Control Theoretic Smoothing Splines, *IEEE Signal Processing Letters*, vol. 21, no. 11, pp. 1394-1397, Nov. 2014.

23. **M. Nagahara**, D. E. Quevedo, and J. Østergaard, Sparse Packetized Predictive Control for Networked Control over Erasure Channels, *IEEE Transactions on Automatic Control* Vol. 59, No. 7, pp. 1899–1905, July 2014.
24. **M. Nagahara** and Y. Yamamoto,  $H^\infty$ -optimal fractional delay filters, *IEEE Transactions on Signal Processing* Vol. 61, No. 18, pp. 4473–4480, 2013.
25. **M. Nagahara** and C. F. Martin, Monotone Smoothing Splines Using General Linear Systems, *Asian Journal of Control*, Vol. 5, No. 2, pp. 461–468, Mar. 2013.
26. K. Hayashi, **M. Nagahara**, and T. Tanaka, A User's Guide to Compressed Sensing for Communications Systems, invited paper, *IEICE Trans. on Communications*, Vol. E96-B, No. 3, pp. 685–712, Mar. 2013.
27. **M. Nagahara** and Y. Yamamoto, Frequency domain min-max optimization of noise-shaping delta-sigma modulators, *IEEE Transactions on Signal Processing* Vol. 60, No. 6, pp. 2828–2839, 2012.
28. Y. Yamamoto, **M. Nagahara** and P. P. Khargonekar, A Brief Overview of Signal Reconstruction via Sampled-Data  $H^\infty$  Optimization, *Applied and Computational Mathematics*, Vol. 11, No. 1, pp. 3–18, 2012.
29. **M. Nagahara**, T. Matsuda, and K. Hayashi, Compressive Sampling for Remote Control Systems, *IEICE Trans. on Fundamentals*, Vol. E95-A, No. 4, pp. 713–722, Apr. 2012.
30. Y. Yamamoto, **M. Nagahara**, and P. P. Khargonekar, Signal Reconstruction via  $H^\infty$  Sampled-Data Control Theory — Beyond the Shannon Paradigm, *IEEE Transactions on Signal Processing*, Vol. 60, No. 2, pp. 613–625, Feb. 2012.
31. S. Miyazaki, T. Kudoh, **M. Nagahara**, N. Hayashi, and Y. Yamamoto, Power Balancing Control for Energy Management Systems, *Panasonic Technical Journal*, Vol. 57, No. 4, pp. 17–22, Jan. 2012. (in Japanese)
32. T. Matsuda, **M. Nagahara**, and K. Hayashi, Link quality classifier with compressed sensing based on  $l_1$ - $l_2$  optimization, *IEEE Communications Letters*, vol. 15, no. 10, pp. 1117–1119, Oct. 2011.
33. **M. Nagahara**, M. Ogura, and Y. Yamamoto,  $H^\infty$  design of periodically nonuniform interpolation and decimation for non-band-limited signals, *SICE Journal of Control, Measurement, and System Integration*, Vol. 4, No. 5, pp. 341–348, 2011.
34. **M. Nagahara** and Y. Yamamoto,  $H^\infty$  optimal approximation for causal spline interpolation, *Signal Processing*, Vol. 91, No. 2, pp. 176–184, 2011.
35. K. Kashima, Y. Yamamoto and **M. Nagahara**, Optimal wavelet expansion via sampled-data control theory, *IEEE Signal Processing Letters*, Vol. 11, Issue 2, pp. 79–82, 2004.
36. Y. Yamamoto, B. D. O. Anderson, **M. Nagahara** and Y. Koyanagi, Optimizing FIR approximation for discrete-time IIR filters, *IEEE Signal Processing Letters*, Vol. 10, Issue 9, pp. 273–276, 2003.
37. **M. Nagahara**, Y. Yamamoto, Sampled-data  $H^\infty$  design for digital communication systems, *Transactions of ISCIE*, Vol. 16, No. 1, pp. 38–43, 2003 (in Japanese)
38. Y. Wakasa, D. Yasufuku, **M. Nagahara** and Y. Yamamoto, Sampled-data design of interpolators using the cutting-plane method, *SICE Transactions*, Vol. 38, No. 5, pp. 462–468, 2002 (in Japanese)
39. **M. Nagahara** and Y. Yamamoto, Sampled-data  $H^\infty$  design of interpolators, *Transactions of ISCIE*, Vol. 14, No. 10, pp. 483–489, 2001 (in Japanese)

## Refereed Conference Proceedings

1. M. Kishida, **M. Nagahara**, and D. Chatterjee, Discrete-time maximum hands-off control with minimum switches, *2019 IEEE Conference on Decision and Control (CDC)*, pp. 529-534, Nice, France, 11 Dec 2019.
2. S. Azuma and **M. Nagahara**, Majority determination on binary-valued communication networks, *2019 IEEE Conference on Decision and Control (CDC)*, pp. 885-889, Nice, France, 11 Dec 2019.
3. M. Barforooshan, **M. Nagahara**, and J. Ostergaard, Sparse packetized predictive control over communication networks with packet dropouts and time delays, *2019 IEEE Conference on Decision and Control (CDC)*, pp. 8272-8277, Nice, France, 13 Dec 2019.
4. K. Nakashima, T. Matsuda, **M. Nagahara**, and T. Takine, Control Vector Selection with State Clustering for Wireless Networked Control Systems, *IEEE 90th Vehicular Technology Conference: VTC2019-Fall*, Honolulu, Hawaii, USA, pp.1-5, 22-25 September 2019.
5. Y. Fujimoto, T. Tokushige, **M. Nagahara**, Bayesian LPV-FIR identification of wheelchair dynamics, *SICE Annual Conference*, Hiroshima, 12 Sept, pp. 1036-1039, 2019.
6. Y. Fujimoto, F. Abe, **M. Nagahara**, Room impulse response estimation with kernel-based regularization, *SICE Annual Conference*, Hiroshima, 11 Sept, pp. 528-531, 2019.
7. S. M. Rayyan and **M. Nagahara**, State-Space Realization of Linear Time-Invariant Systems with Maximum Measure of Quality, *12th Asian Control Conference (ASCC)*, pp. 1376-1379, 12 June 2019.
8. **M. Nagahara** and D. Chatterjee, Continuity of the Combined  $L^1$ - $L^2$  Optimal Control for Linear Systems, *5th Indian Control Conference (ICC)*, pp. 506-509, Delhi, Jan, 2019.
9. Y. Yamamoto, K. Yamamoto, and **M. Nagahara**, Sampled-data Filters with Compactly Supported Acquisition Prefilters, *2018 IEEE Conference on Decision and Control (CDC)*, pp. 6650-6655, Miami Beach, 19 Dec 2018.
10. M. Kishida, M. Barforooshan, and **M. Nagahara**, Maximum Hands-Off Control for Discrete-time Linear Systems Subject to Polytopic Uncertainties, *7th IFAC Workshop on Distributed Estimation and Control in Networked Systems (NecSys2018)*, pp. 355-360, Groningen, Aug. 2018.
11. K. Fujimoto, J. Muramatsu, and M. nagahara, Dynamical Model of Overconfidence Phenomena Due to ZE-type Confirmation Bias,, *IEEE International Conference on Systems, Man, and Cybernetics (SMC2018)*, 7-10 Oct 2018.
12. **M. Nagahara** and D. Chatterjee, Optimal Control with Sparsity Constraints in the Frequency Domain, *SICE Annual Conference*, pp. 398-400, Nara, 12 Sept, 2018.
13. N. Hayashi and **M. Nagahara**, Consensus-Based Distributed Event-Triggered Sparse Modeling, *SICE Annual Conference*, pp. 1801-1805, Nara, 14 Sept, 2018.
14. K. Nakashima, T. Matsuda, **M. Nagahara**, and T. Takine, Control Vector Selection with Delay Estimation in Wireless Networked Control Systems, *IEEE International Conference on Consumer Electronics*, Taichung, Taiwan, pp. 81-82, 19-21 May 2018.
15. K. Yamamoto, **M. Nagahara**, Y. Yamamoto, Signal Reconstruction with Generalized Sampling, *56th IEEE Conference on Decision and Control (CDC2017)*, Melbourne, Australia, Dec. 12-15, 2017.
16. **M. Nagahara**, S. Takahashi, H. Higuchi, and T. Takebayashi, Sparse Optimization of Physical Distribution Systems based on Maximum Hands-off Control, *2017 International Symposium on Nonlinear Theory & Its Applications (NOLTA2017)*, Cancun, Mexico, Dec. 4-7, 2017.

17. K. Nakashima, T. Matsuda, **M. Nagahara**, and T. Takine, Cross-Layer Design of an LQG Controller in Multihop TDMA-Based Wireless Networked Control Systems, *IEEE 28th Annual International Symposium on Personal, Indoor, and Mobile Radio Communications (PIMRC)*, Montreal, QC, Canada, October 8-13, 2017.
18. **M. Nagahara**, N. Challapalli, and M. Vidyasagar, CLOT Optimization for Distributed Hands-Off Control with Continuity, *SICE Annual Conference*, Sept. 21, 2017.
19. K. Yamamoto, Y. Yamamoto, and **M. Nagahara**, Hypertracking Beyond the Nyquist Frequency, *Emerging Applications of Control and System Theory (EACST 2017)*, Dallas, Texas, USA, Sept. 2017.
20. K. Yamamoto, Y. Yamamoto, and **M. Nagahara**, Simultaneous rejection of signals below and above the Nyquist frequency, *1st IEEE Conference on Control Technology and Applications (CCTA)*, Hawaii, USA, Aug. 29, 2017.
21. N. Challapalli, **M. Nagahara**, and M. Vidyasagar, Continuous Hands-off Control by CLOT Norm Minimization, *20th IFAC World Congress 2017*, pp. 15019-15024, Toulouse, France, July 14, 2017.
22. H. Sasahara, K. Hayashi, **M. Nagahara**, Symbol Detection for Faster-than-Nyquist Signaling by Sum-of-Absolute-Values Optimization, *42nd IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP 2017)*, 2017.
23. S. Ohno, T. Shiraki, M. R. Tariq, **M. Nagahara**, Rate-distortion analysis of delta-sigma modulators, *42nd IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP 2017)*, 2017.
24. Y. Yamamoto, K. Yamamoto and **M. Nagahara**, Tracking of signals beyond the Nyquist frequency, *55th IEEE Conference on Decision and Control (CDC)*, Las Vegas, NV, 2016, pp. 4003-4008.
25. T. Ikeda, **M. Nagahara** and K. Kashima, Consensus by maximum hands-off distributed control with sampled-data state observation, *55th IEEE Conference on Decision and Control (CDC)*, Las Vegas, NV, 2016, pp. 962-966.
26. M. R. Tariq, S. Ohno and **M. Nagahara**, Synthesis of IIR error feedback filters for  $\Delta \Sigma$  modulators using approximation, *2016 Asia-Pacific Signal and Information Processing Association Annual Summit and Conference (APSIPA)*, Jeju, 2016.
27. R. Hayakawa, K. Hayashi, H. Sasahara, and **M. Nagahara**, Massive Overloaded MIMO Signal Detection via Convex Optimization with Proximal Splitting, *The 2016 European Signal Processing Conference (EUSIPCO)*, Aug.-Sept. 2016.
28. T. Ikeda, **M. Nagahara** and D. E. Quevedo, Quantized self-triggered control by sum-of-absolute-values optimization, *22nd International Symposium on Mathematical Theory of Networks and Systems (MTNS)*, Minneapolis, Jul. 2016.
29. H. Sasahara, K. Hayashi, **M. Nagahara**, and Y. Yamamoto, Control Theoretical Approach for Single-Frequency Full-Duplex Wireless Relaying, *22nd International Symposium on Mathematical Theory of Networks and Systems (MTNS)*, Minneapolis, Jul. 2016.
30. T. Ikeda and **M. Nagahara**, Fundamental analysis of sparse optimal control and its application to discrete-valued control, *2016 American Control Conference (ACC)*, Boston, Jul. 2016.
31. T. Ikeda and **M. Nagahara**, Maximum hands-off control without normality assumption, *2016 American Control Conference (ACC)*, Boston, Jul. 2016.
32. H. Sasahara, K. Hayashi, and **M. Nagahara**, Multiuser Detection by MAP Estimation with Sum-of-Absolute-Values Relaxation, *IEEE International Conference on Communications (ICC) 2016*, May 2016.



33. T. Ikeda and **M. Nagahara**, Computation of maximum hands-off control, *SICE International Symposium on Control Systems 2016*, Nagoya, Mar. 9, 2016.
34. H. Sasahara, K. Hayashi, and **M. Nagahara**, Faster-than-Nyquist Signaling by Sum-of-Absolute-Values, *SICE International Symposium on Control Systems 2016*, Nagoya, Mar. 2016.
35. H. Sasahara, **M. Nagahara**, K. Hayashi, Y. Yamamoto, Sampled-data  $H^\infty$  optimization for self-interference suppression in baseband signal subspaces, *54th IEEE Conference on Decision and Control (CDC)*, Osaka, pp. 7244-7249, Dec. 18, 2015.
36. H. Sasahara, **M. Nagahara**, K. Hayashi, Y. Yamamoto, Time-domain equalization for single-frequency full-duplex wireless relay using  $H_2$  optimal control, *47th ISCIE International Symposium on Stochastic Systems Theory and Its Applications (SSS'15)*, Hawaii, Dec. 5, 2015.
37. T. Ikeda and **M. Nagahara**, Discrete model predictive control by sum-of-absolute-values optimization, *47th ISCIE International Symposium on Stochastic Systems Theory and Its Applications (SSS'15)*, Hawaii, Dec. 5, 2015.
38. M. Ogura, **M. Nagahara**, and V. M. Preciado,  $L^1$ -optimal disturbance rejection for disease spread over time-varying networks, *The First International Symposium on Swarm Behavior and Bio-Inspired Robotics (SWARM2015)*, pp. 377-378, October 28-30, Kyoto, 2015.
39. H. Sasahara, **M. Nagahara**, K. Hayashi, and Y. Yamamoto, Loop-Back Interference Suppression for OFDM Signals via Sampled-Data Control *10th Asian Control Conference (ASCC)*, paper ID: 1570072769, pp. 1-4, May-Jun. 2015.
40. T. Ikeda and **M. Nagahara**, Continuity of the Value Function in Sparse Optimal Control, *10th Asian Control Conference (ASCC)*, paper ID: 1570074957, pp. 1-4, May-Jun. 2015.
41. H. Sasahara, **M. Nagahara**, K. Hayashi, and Y. Yamamoto, Communication Performance Analysis of Sampled-Data  $H^\infty$  Optimal Coupling Wave Canceler *SICE International Symposium on Control Systems*, 513-5 (2 pages), Mar. 2015.
42. T. Ikeda and **M. Nagahara**, Value Functions in Sparse Optimal and  $L^1$  Optimal Controls, *SICE International Symposium on Control Systems*, 513-3 (6 pages), Mar. 2015.
43. **M. Nagahara**, H. Sasahara, K. Hayashi, and Y. Yamamoto, Sampled-data  $H^\infty$  design of coupling wave cancelers in single-frequency full-duplex relay stations, *SICE Annual Conference 2014*, pp. 401-406, Sept. 2014.
44. **M. Nagahara** and Y. Yamamoto, FIR digital filter design by sampled-data  $H^\infty$  discretization, *19th IFAC World Congress*, pp. 3110-3115, Aug. 2014.
45. **M. Nagahara**, D. E. Quevedo, and D. Nesic, Maximum-hands-off control and  $L^1$  optimality, *52nd IEEE Conference on Decision and Control (CDC)*, pp. 3825-3830, Dec. 2013.
46. **M. Nagahara** and Y. Yamamoto, Optimal discretization of analog filters via sampled-data  $H^\infty$  control theory, *2013 IEEE Multi-Conference on Systems and Control (MSC 2013)*, pp. 527-532, Aug. 2013.
47. **M. Nagahara** and C. F. Martin,  $L^1$ -optimal splines for outlier rejection, *The 59th World Statistics Congress*, pp. 1137-1142, Aug. 2013.
48. **M. Nagahara**, D. E. Quevedo, and J. Ostergaard, Packetized predictive control for rate-limited networks via sparse representation, *51st IEEE Conference on Decision and Control (CDC)*, pp. 1362-1367, Dec. 2012.

49. **M. Nagahara**, Y. Yamamoto, S. Miyazaki, T. Kudoh, and N. Hayashi,  $H^\infty$  control of microgrids involving gas turbine engines and batteries, *51st IEEE Conference on Decision and Control (CDC)*, pp. 4241-4246, Dec. 2012.
50. **M. Nagahara**, D. Quevedo, and J. Ostergaard, Sparsely-packetized predictive control by orthogonal matching pursuit *Mathematical Theory of Networks and Systems (MTNS2012)*, paper ID: 0156 (3 pages), Jul. 2012.
51. **M. Nagahara** and Y. Yamamoto,  $H^\infty$  optimal fractional delay filters with application to pitch shifting, *2012 IFAC Workshop on Time Delay Systems*, pp. 61-66, Jun. 2012.
52. **M. Nagahara**, D. E. Quevedo, T. Matsuda, and K. Hayashi, Compressive sampling for networked feedback control, *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, pp. 2733-2736, Mar. 2012.
53. **M. Nagahara**, D. E. Quevedo, J. Ostergaard, T. Matsuda, and K. Hayashi, Sparse Command Generator for Remote Control, *The 9th IEEE International Conference on Control & Automation (ICCA)*, pp. 1055-1059, Dec. 2011.
54. **M. Nagahara**, K. Hanibuchi, and Y. Yamamoto, Pitch Shifting by H-Infinity-Optimal Variable Fractional Delay Filters, *IFAC 18th World Congress*, pp. 4386-4391, Aug. 2011.
55. **M. Nagahara**, D. E. Quevedo Sparse Representations for Packetized Predictive Networked Control, *IFAC 18th World Congress*, pp. 84-89, Aug. 2011.
56. **M. Nagahara**, K. Hanibuchi, and Y. Yamamoto, Duration-invariant pitch-shifting for stringed instruments, *3rd International Conference on Control and Optimization with Industrial Applications (COIA)*, paper ID: MAI-EE01 (2 pages), Aug. 2011.
57. **M. Nagahara**, C. F. Martin, and Y. Yamamoto, Quadratic programming for monotone control theoretic splines, *SICE Annual Conference 2010*, pp. 531-534, Taipei, 2010
58. **M. Nagahara** and Y. Yamamoto, Robust Repetitive Control by Sampled-Data H-Infinity Filters, *48th IEEE Conference on Decision and Control and 28th Chinese Control Conference (CDC/CCC)*, pp. 8136-8141, 2009.
59. **M. Nagahara**, M. Ogura, and Y. Yamamoto, A Novel Approach to Repetitive Control via Sampled-data  $H^\infty$  Filters, *the 7th Asian Control Conference (ASCC)*, pp. 160-165, Aug. 2009.
60. **M. Nagahara** and Y. Yamamoto, Optimal Design of Delta-Sigma Modulators via Generalized KYP Lemma, *ICROS-SICE International Joint Conference 2009 (ICASS-SICE2009)*, pp. 4376-4379, Aug. 2009.
61. **M. Nagahara**, K. I. Sato, and Y. Yamamoto,  $H^2/H^\infty$  Approach to the Histogram Method for Density Estimation, *ICROS-SICE International Joint Conference 2009 (ICASS-SICE2009)*, pp. 1230-1233, Aug. 2009.
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63. **M. Nagahara**, K. Sato, and Y. Yamamoto,  $H^\infty$  optimal nonparametric density estimation from quantized samples, *The 40th ISCTE International Symposium on Stochastic Systems Theory and Its Applications (SSS)*, Nov. 2008.

64. **M. Nagahara**, M. Ogura, and Y. Yamamoto, Interpolation of nonuniform decimated signals via sampled-data  $H^\infty$  optimization, *SICE Annual Conference*, pp. 1151-1154, Aug. 2008.
65. **M. Nagahara** and Y. Yamamoto, and Pramod P. Khargonekar, Stability of signal reconstruction filters via cardinal exponential splines, *IFAC World Congress*, pp. 1414-1419, Jul. 2008.
66. **M. Nagahara** and Y. Yamamoto, Hybrid design of filtered-x adaptive algorithm via sampled-data control theory, *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, pp. 353-356, Apr. 2008.
67. M. Ogura, **M. Nagahara** and Y. Yamamoto, Optimal wavelet expansion via sampled-data  $H^\infty$  control theory, *SICE Annual Conference*, pp. 1422-1426, Oct. 2007.
68. **M. Nagahara** and Y. Yamamoto, Causal spline interpolation by  $H^\infty$  optimization, *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, Vol. III, pp. 1469-1472, Apr. 2007.
69. **M. Nagahara**, T. Wada and Y. Yamamoto, Causal spline interpolation by  $H^\infty$  optimization, *SICE-ICCAS 2006*, pp. 4160-4163, Oct. 2006.
70. **M. Nagahara**, T. Wada and Y. Yamamoto, Design of delta-sigma converters via sampled-data  $H^\infty$  optimization, *Mathematical Theory of Networks and Systems*, MTNS2006, paper ID: FrP09.3 (9 pages), Jul. 2006.
71. **M. Nagahara**, T. Wada and Y. Yamamoto, Design of oversampling delta-sigma DA converters via  $H^\infty$  optimization, *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, Vol. III, pp. 612-615, May, 2006.
72. H. Kakemizu, **M. Nagahara**, A. Kobayashi and Y. Yamamoto, Noise reduction of JPEG images by sampled-data  $\infty$  optimal epsilon filters, *SICE Annual Conference*, pp. 1080-1085, Aug. 2005.
73. **M. Nagahara** and Y. Yamamoto, Optimal design of fractional delay FIR filters without band-limiting assumption, *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, pp. 221-224, Mar. 2005.
74. Y. Ohta and **M. Nagahara**, On the computation of value sets of multi-linear functions, *2004 CCA/ISIC/CACSD*, pp. 161-166, Taipei, Sept. 2004.
75. G. Ooi, **M. Nagahara** and Y. Yamamoto, Repetitive control via sampled-data  $H^\infty$  control, *IFAC Workshop on Periodic Control Systems*, pp. 561-565, Aug. 2004.
76. S. Ashida, H. Kakemizu, **M. Nagahara** and Y. Yamamoto, Sampled-data audio signal compression with Huffman coding, *SICE Annual Conference*, pp. 972-976, Sapporo, Aug. 2004.
77. **M. Nagahara** and Y. Yamamoto, Optimal design of fractional delay filters, *42nd IEEE Conference on Decision and Control (CDC)*, pp. 6539-6544, Maui, Dec. 2003.
78. S. Ashida, **M. Nagahara** and Y. Yamamoto, Audio signal compression via sampled-data control theory, *SICE Annual Conference*, pp. 1182-1185, Fukui, Aug. 2003.
79. Y. Wakasa, D. Yasufuku, **M. Nagahara** and Y. Yamamoto, Sampled-data design of interpolators using the cutting-plane method, *41st IEEE Conference on Decision and Control (CDC)*, pp. 2564-2569, Las Vegas, Dec. 2002.
80. Y. Yamamoto, B. D. O. Anderson and **M. Nagahara**, Approximating sampled-data systems with applications to digital redesign, *41st IEEE Conference on Decision and Control (CDC)*, pp. 3724-3729, Las Vegas, Dec. 2002.

81. J. Shimada, M. Kawakami, S. Endoh, F. Ikeda, **M. Nagahara** and Y. Yamamoto, The basis of magnetic navigation system for surgery,, *Computer Assisted Radiology and Surgery (CARS)*, Proc. of the 16th International Congress and Exhibition, p. 1088 June 26-29, 2002.
82. Y. Yamamoto, B. D. O. Anderson, **M. Nagahara** and Y. Koyanagi, Optimal FIR approximation for discrete-time IIR filters, *4th Asian Control Conference (ASCC)*, pp. 2008-2013, Singapore, Sept. 2002.
83. K. Kashima, Y. Yamamoto and **M. Nagahara**, Optimal wavelet expansion via sampled-data control, *40th IEEE Conference on Decision and Control (CDC)*, pp. 4788-4793, Orlando, Dec. 2001.
84. **M. Nagahara** and Y. Yamamoto, Design for digital communication systems via sampled data  $H^\infty$  control, *IFAC Workshop on Periodic Control Systems*, pp. 211-216, Cernobbio-Como, Aug. 2001.
85. **M. Nagahara** and Y. Yamamoto, A new design for sample-rate converters, *39th IEEE Conference on Decision and Control (CDC)* , pp. 4296-4301, Sydney, Dec. 2000.
86. Y. Yamamoto, **M. Nagahara** and H. Fujioka, Multirate signal reconstruction and filter design via sampled-data  $H^\infty$  control, *Mathematical Theory of Networks and Systems (MTNS)*, CD-ROM, Perpignan, Jun. 2000.

## Review Papers (written in Japanese)

1. **M. Nagahara**, Control and optimization over networks, *Systems,Control, and Information*, Vol. 63, No. 11, pp. 449-454, 2019.
2. **M. Nagahara**, Technologies of artificial intelligence and automatic control for vehicles, *Automotive Technology*, Vol. 7, No. 2, pp. 45-47, 2019.
3. T. Hatanaka and **M. Nagahara**, Systems and control technology for Society 5.0, *Journal of the Society of Instrument and Control Engineers*, Vol. 58, No. 8, pp. 579-582, 2019.
4. **M. Nagahara**, Dynamical sparse modeling and networked control, *The Journal of the Institute of Image Information and Television Engineers*, Vol. 73, No. 3, pp. 451-453, 2019.
5. S. Honda and **M. Nagahara**, Activities of SICE towards realization of Society5.0, *Oukan (Transdisciplinary Federation of Science and Technology)*, Vol. 12, No. 1, pp. 43-51, 2018.
6. **M. Nagahara**, Optimal control and sparse modeling, *IEICE ESS Fundamentals Review*, Vol. 10, No. 3, pp. 176-185, 2017.
7. **M. Nagahara**, Convex optimization for sparse modeling, *Systems,Control, and Information*, Vol. 61, No. 1, pp. 20-28, 2016.
8. Y. Tanaka and **M. Nagahara**, Control and signal processing over networks, *Journal of the Society of Instrument and Control Engineers*, Vol. 55, No. 11, pp. 924-929, 2016.
9. **M. Nagahara**, Sparse modeling for networked control, *Journal of the Society of Instrument and Control Engineers*, Vol. 55, No. 11, pp. 978-983, 2016.
10. Y. Yamamoto and **M. Nagahara**, Sampled-data control and its applications to digital signal processing, *Systems,Control, and Information*, Vol. 56, No. 9, pp. 468-473, 2012.
11. Y. Yamamoto and **M. Nagahara**, How to write ISCIE papers in L<sup>A</sup>T<sub>E</sub>X, *Systems,Control, and Information*, Vol. 56, No. 7, pp. 367-374, 2012.
12. **M. Nagahara**, Discrete-time control, *Systems,Control, and Information*, Vol. 56, No. 6, pp. 298-301, 2012.

13. **M. Nagahara**, State-space representation and stability, Vol. 56, No. 4, pp. 176–179, 2012.
14. Y. Yamamoto and **M. Nagahara**, Control theory and signal processing, *The Journal of the Institute of Image Information and Television Engineers*, Vol. 61, No. 12, pp. 1710–1715, 2007.
15. **M. Nagahara**, Between analog and digital, *Systems, Control, and Information*, Vol. 51, No. 4, pp. 189–190, 2007.
16. Y. Yamamoto and **M. Nagahara**, Introduction to sampled-data control systems: design considering the intersample behavior, *Bulletin of the Iron and Steel Institute of Japan*, Vol. 8, No. 5, pp. 297–302, 2003.
17. **M. Nagahara** and Y. Yamamoto, Robust design of digital communication systems via sampled-data control, *Journal of the Society of Instrument and Control Engineers*, Vol. 41, No. 7, pp. 491–495, 2002.
18. Y. Yamamoto and **M. Nagahara**, Digital signal processing via sampled-data control, *Systems, Control, and Information*, Vol. 45, No. 4, pp. 162–167, 2001.

## Plenary/Invited/Tutorial Lectures

1. **Invited Speaker** in 2019 SICE Symposium on Industrial Applications, Tokyo, Japan, 31/October/2019.
2. **Invited Lecture** at Tokyo Denki University, Tokyo, Japan, 29/October/2019.
3. **Tutorial Lecture** in 2019 IEEE Conference on Control Technology and Applications (CCTA), Hong Kong, 21/August/2019.
4. **Invited Lecture** at Tokyo Denki University, Tokyo, Japan, 26/June/2019.
5. **Invited Lecture** at University of Paderborn, Germany, 27/February/2019.
6. **Invited Lecture** at Technische Universität Berlin, Germany, 13/February/2019.
7. **Invited Speaker** in Workshop on "Current trends and Future directions in Control", IIT Bombay Diamond Jubilee Workshop, India, 16/January/2019.
8. **Invited Lecture** at Fujitsu Laboratories, Kawasaki, Japan, 12/June/2018.
9. **Plenary Lecture** in Symposium on Measurement, Control, and Systems Engineering, The Iron and Steel Institute of Japan, Hitachi, Japan, 16/November/2017.
10. **Plenary Speaker** in Design Gaia, IEICE Technical Committee on VLSI, Kumamoto, Japan, 7/November/2017.
11. **Plenary Speaker** in Modeling Decisions for Artificial Intelligence (MDAI2017), Kitakyushu, Japan, October 2017.
12. **Tutorial Lecture** in SICE Annual Conference 2017, Kanazawa, Japan, 19/October/2017.
13. **Invited Lecture** at Nagoya University, Nagoya, Japan, 31/May/2017.
14. **Invited Lecture** at Osaka University, Osaka, Japan, 1/May/2017.
15. **Tutorial Lecture** in SICE Control Division Multi Symposium, Okayama, Japan, 6/March/2017.
16. **Invited Lecture** at Indian Institute of Technology Bombay, India, 15/February/2017, 1/March/2017.

17. **Invited Speaker** in Control Forum, The Iron and Steel Institute of Japan, Amagasaki, Japan, 23/January/2017.
18. **Invited Speaker** at Higashi-Fuji Technical Center, Toyota Motor Corporation, Higashi-Fuji, Japan, 25/November/2016.
19. **Tutorial Lecture** in IEICE Technical Committee on Reliable Communication and Control (RCC), Kyoto, 21/November/2016.
20. **Invited Lecture** at Nara Institute of Science and Technology, Nara, Japan, 7/November/2016.
21. **Plenary Lecture** in 48th ISCIE International Symposium on Stochastic Systems Theory and Its Applications (SSS), Fukuoka, Japan, 4/November/2016.
22. **Tutorial Lecture** in SICE Seminar on Control of Multi-agent Systems, Tokyo, Japan, 29-30/September/2016.
23. **Invited Lecture** at Osaka University, 29/August/2016.
24. **Invited Speaker** in RACOT (Recent Advances in Control Theory), Fukuoka, Japan, 25/June/2016.
25. **Tutorial Lecture** in Annual Conference of the Institute of Systems, Control and Information Engineers (SCI'16), Kyoto, Japan, 26/May/2016.
26. **Invited Lecture** at Indian Institute of Technology Bombay, India, 20/May/2016.
27. **Tutorial Lecture** in SICE Multi-Symposium on Control Systems, Nagoya, Japan, 10/March/2016.
28. **Invited Speaker** in IEICE Technical Committee on Signal Processing, Osaka, Japan, 18/January/2016.
29. **Tutorial Lecture** in Japan Joint Automatic Control Conference, Kobe, Japan, 14/November/2015.
30. **Invited Lecture** at Osaka Electro-Communication University, Osaka, Japan, 26/October/2015.
31. **Invited Lecture** at Hiroshima University, Hiroshima, Japan, 9/October/2015.
32. **Tutorial Lecture** in SICE Technical Committee on Control and Signal Processing over Networks, Kyoto, Japan, 29/September/2015.
33. **Invited Lecture** at Aalborg University, Denmark, 24/September/2015.
34. **Tutorial Lecture** in IEICE Society Conference 2015, Sendai, Japan, 9/September/2015.
35. **Invited Speaker** in IEICE SmartCom2014, Singapore, 31/October/2014.
36. **Tutorial Lecture** in 21st International Symposium on Mathematical Theory of Networks and Systems (MTNS2014), Groningen, The Netherlands, 8/July/2014.
37. **Invited Speaker** in Joint IEEE CSS-Graduate School of Informatics, Kyoto U. Workshop on Systems and Control, Kyoto, Japan, 9/May/2013.
38. **Invited Speaker** in Technical Committee on Reliable Robust Radio (RRR), Nagoya, Japan, 3/August/2012.
39. **Invited Lecture** at Niigata University, Niigata, Japan, 25/November/2011.
40. **Invited Panelist** in IEICE Society Conference 2011, Sapporo, Japan, 15/September/2011.
41. **Tutorial Lecture** in IEICE Society Conference 2011, Sapporo, Japan, 13/September/2011.

42. **Invited Panelist** in IEICE Technical Committee on Reliable Communication and Control (RCC), 28/July/2010.
43. **Invited Speaker**, YYFest 2010, Symposium on Systems, Control, and Signal Processing in Honor of Yutaka Yamamoto on the Occasion of his 60's Birthday, Kyoto, Japan, 29/March/2010.
44. **Invited Panelist** in IEICE Society Conference 2009, Niigata, Japan, 18/September/2009.

## Externally Funded Research Grants

1. April 2019–March 2022: **Co-investigator**, *Construction and Verification of Optimal Operation and Control of Soil-Heat Exchange Systems by Deep Reinforcement Learning*, MEXT Grant-in-Aid for Scientific Research (B), Japan (3 years, JPY17,420,000, PI: Prof. Yasuyuki Shiraishi)
2. April 2017–March 2019: **Principal Investigator**, *Dynamical Sparse Modeling by Optimal Control Theory and Statistical Learning* MEXT Fund for the Promotion of Joint International Research (Fostering Joint International Research), Japan (2years, JPY13,520,000)
3. April 2016–March 2018]: **Principal Investigator**, *Dynamical Sparse Modeling and Its Applications to Bio-Mechanics*, MEXT Grant-in-Aid for Scientific Research on Innovative Areas (Research in a proposed research area), Japan (2 years, JPY4,810,000)
4. April 2015–March 2017: **Principal Investigator**, *Design of Super-distributed Control Systems for Unreliable Multi-agents and Its Application to Disaster Area Survey*, MEXT Grant-in-Aid for Challenging Exploratory Research, Japan (2 years, JPY3,900,000)
5. April 2015–March 2019: **Principal Investigator**, *Sparse Optimal Control Theory for Green Technology*, MEXT Grant-in-Aid for Scientific Research (B), Japan (4 years, JPY16,900,000)
6. April 2014–March 2016: **Principal Investigator**, *Sparse Modelling for Biomechanics by Sparse Optimal Control Theory*, MEXT Grant-in-Aid for Scientific Research on Innovative Areas (Research in a proposed research area), Japan (2 years, JPY4,550,000)
7. April 2014–March 2018: **Research Collaborator**, *Communication Protocol Design for Wireless Control Systems*, MEXT Grant-in-Aid for Young Scientists (B), Japan (4 years, JPY4,030,000, PI: Prof. Megumi Kaneko)
8. March 2014–March 2015: **Principal Investigator**, *Low-power and Reliable Communications for Radio Control based on Sparse Optimisation*, Okawa Foundation for Information and Telecommunications, Research Grant, Japan (1 year, JPY1000,000)
9. April 2013–May 2014: **Principal Investigator**, *Phonetic Analysis and Learning System Design for Utai of Noh Music*, KAWAI Foundation for Sound Technology & Music, Research Grant, Japan (1 year, JPY500,000)
10. April 2012–March 2015: **Co-Investigator**, *System Theory for Mon-stationary Signals via Sampled-Data Control Theory and Its Applications*, MEXT Grant-in-Aid for Scientific Research (B), Japan (3 years, JPY18,590,000, PI: Prof. Yutaka Yamamoto)
11. April 2012–March 2015: **Principal Investigator**, *Reliable Communications for Networked Control Systems Based on Sparse Representation*, MEXT Grant-in-Aid for Scientific Research (C), Japan (3 years, JPY5590,000)

12. April 2010–March 2012: **Principal Investigator**, *Optimal Discretization of Infinite-dimensional Controllers based on Sampled-data Control Theory*, MEXT Grants-in-Aid for Young Scientist (B), Japan (2 years, JPY3770,000)
13. April 2010–March 2013: **Co-Investigator**, *Study of Numerical Analysis via Control Theory*, MEXT Grant-in-Aid for Challenging Exploratory Research, Japan (3 years, JPY3,640,000, PI: Prof. Yutaka Yamamoto)
14. April 2009–March 2012: **Co-Investigator**, *Hybrid Signal Processing via Sampled-data Control Theory*, MEXT Grant-in-Aid for Scientific Research (B), Japan (3 years, JPY17,940,000, PI: Prof. Yutaka Yamamoto)
15. April 2006–March 2009: **Co-Investigator**, *New methodology in Signal Processing via Sampled-data Control Theory and Its Development in New Non-stationary System Theory*, MEXT Grant-in-Aid for Scientific Research (B), Japan (3 years, JPY17,280,000, PI: Prof. Yutaka Yamamoto)
16. April 2005–March 2008: **Co-Investigator**, *Research on Finite Dimensional Conditions for Control of Distributed Parameter Systems*, MEXT Grant-in-Aid for Exploratory Research, Japan (3 years, JPY3,300,000, PI: Prof. Yutaka Yamamoto)
17. April 2004–March 2007: **Principal Investigator**, *Novel Multimedia Signal Processing with Analog Performance*, MEXT Grants-in-Aid for Young Scientist (B), Japan (3 years, JPY3500,000)
18. April 2003–March 2016: **Co-Investigator**, *General Theory of Digital Signal Processing via-Sampled Data Control Theory and Its Applications*, Japan (3 years, JPY13,400,000, PI: Prof. Yutaka Yamamoto)
19. April 2002–March 2003: **Principal Investigator**, *Digital Signal Processing with Analog Performance based on Sampled-data Control Theory*, JSPS Research fellow (DC2), Japan (1 year, JPY1000,000)
20. April 2002–March 2005: **Co-Investigator**, *System Theory for Numerical Analysis*, MEXT Grant-in-Aid for Exploratory Research, Japan (3 years, JPY3,100,000)

## Patents (USA)

### Granted Patents

1. Method and system for power system stabilization using prediction confidence based on high-frequency components of power command value, Patent number: 9780562, Type: Grant, Filed: October 8, 2015, Date of Patent: October 3, 2017, Assignee: Panasonic Corporation, Inventors: Kenichi Watanabe, Seiya Miyazaki, Takahiro Kudoh, Yutaka Yamamoto, **Masaaki Nagahara**, Gou Nishida.
2. Method for designing power controller, power controller, and power control device, Patent number: 9407162, Type: Grant, Filed: April 1, 2013, Date of Patent: August 2, 2016, Assignee: Panasonic Corporation, Inventors: Takahiro Kudoh, Tatsuto Kinjo, Seiya Miyazaki, Yutaka Yamamoto, **Masaaki Nagahara**, Naoki Hayashi.
3. Method for designing a control apparatus and control apparatus, Patent number: 9158300, Type: Grant, Filed: May 28, 2012, Date of Patent: October 13, 2015, Assignee: Panasonic Corporation, Inventors: Seiya Miyazaki, Takahiro Kudoh, Yutaka Yamamoto, **Masaaki Nagahara**.
4. Method and apparatus for removing image noise, Patent number: 8611680, Type: Grant, Filed: November 11, 2008, Date of Patent: December 17, 2013, Assignee: Kyoto University, Inventors: Yutaka Yamamoto, **Masaaki Nagahara**, Akira Kobayashi.



5. Method for designing audio signal processing system for hearing aid, audio signal processing system for hearing aid, and hearing aid, Patent number: 8488823, Type: Grant, Filed: August 3, 2009, Date of Patent: July 16, 2013, Assignee: Kyoto University, Inventors: Yutaka Yamamoto, **Masaaki Nagahara**.

## Published Applications

1. Power system stabilization method, power system stabilization system, and power supply device, Publication number: 20160028234, Type: Application, Filed: October 8, 2015, Publication date: January 28, 2016, Inventors: Kenichi Watanabe, Seiya Miyazaki, Takahiro Kudoh, Yutaka Yamamoto, **Masaaki Nagahara**, Gou Nishida.
2. Method for designing power controller, power controller, and power control device, Publication number: 20150131346, Type: Application, Filed: April 1, 2013, Publication date: May 14, 2015, Applicant: Panasonic Corporation, Inventors: Takahiro Kudoh, Tatsuto Kinjo, Seiya Miyazaki, Yutaka Yamamoto, **Masaaki Nagahara**, Naoki Hayashi.
3. Method for designing a control apparatus and control apparatus, Publication number: 20130150993, Type: Application, Filed: May 28, 2012, Publication date: June 13, 2013, Inventors: Seiya Miyazaki, Takahiro Kudoh, Yutaka Yamamoto, **Masaaki Nagahara**.
4. Method and apparatus for removing image noise, Publication number: 20110002552, Type: Application, Filed: November 26, 2008, Publication date: January 6, 2011, Applicant: Kyoto University, Inventors: Yutaka Yamamoto, **Masaaki Nagahara**, Akira Kobayashi.

## Professional Activities and Service

- **2019–present** Associate Editor of *Asian Journal of Control*
- **2019–present** Program Co-Chair, 7th SICE Multi-symposium on Control Systems
- **2019–present** Advisor, AI Technical Committee, Association of Instrumentation Engineers, Japan
- **2019** International Program Committee Member, 6th Indian Control Conference (ICC2019)
- **2018–present** Member of IEEE CSS Technical Committees on Networks and Communications
- **2018–2019** Program Committee Member, 3rd International Symposium on Swarm Behavior and Bio-Inspired Robotics (SWARM2019)
- **2018–2019** Committee Chair of SICE Research Committee on Systems and Control for Society 5.0
- **2018–2019** Committee Vice Chair of SICE Research Committee on Event-triggered Control for IoT
- **2018–2019** Local Committee Member, 12th Asian Control Conference (ASCC2019)
- **2017–present** Division Secretary of SICE Kyushu Branch
- **2016–present** Member of Hibikino Research Group for Social Embedding of AI Technologies (HiSEAT), Japan
- **2016–present** Member of Research Group of Energy Management, Kitakyushu Foundation for the Advancement of Industry, Science and Technology, Japan
- **2015–present** Associate Editor of *SICE Journal of Control, Measurement, and System Integration* (JCMSI)

- **2015–2016** Secretary of IEEE Signal Processing Society (SPS) Kansai Chapter
- **2015–2016** General Affairs Chair of SICE Kansai Chapter
- **2015–2016** Committee Chair of SICE Research Committee on Control and Signal Processing on Networks
- **2015–2016** Local Committee Member, 54th IEEE Conference on Decision and Control (CDC2015)
- **2014–present** Member of IFAC Technical Committee 2.1 Control Design
- **2014–present** Affiliate Member of IEEE Signal Processing Society, Signal Processing Theory and Methods (SPTM) Technical Committee
- **2014–present** Member of Technical Committee on Reliable and Robust Communication and Control (RRRC), IEICE, Japan
- **2014–2015** Program Committee Member, 1st International Symposium on Swarm Behavior and Bio-Inspired Robotics (SWARM2019)
- **2014–2015** Local Committee Member, ISCIE Annual Conference of the Institute of Systems, Control and Information Engineers (SCI'15)
- **2014–2015** Guest Associate Editor, Special Section on Signal Processing for Sensing and Diagnosis, IEICE Trans. Fundamentals
- **2013–present** Associate Editor for *Conference Editorial Board, IEEE Control Systems Society*
- **2013–2014** Local Committee Member, ISCIE Annual Conference of the Institute of Systems, Control and Information Engineers (SCI'14)
- **2013–2014** Local Committee Member, 29th IEICE Signal Processing Symposium (SIP2014)
- **2013** Program Committee Member, 6th International Congress on Image and Signal Processing (CISP 2013) and the 6th International Conference on BioMedical Engineering and Informatics (BMEI 2013)
- **2013** Organizing Committee Member, 28th IEICE Signal Processing Symposium (SIP2013)
- **2013** Program Committee Member, 56th Japan Joint Automatic Control Conference
- **2012–2013** Member of SICE Research Committee on Distributed Decision Making for Large Scale Social Systems
- **2012** Organizing Committee Member, 27th IEICE Signal Processing Symposium (SIP2012)
- **2012** Organizing Committee Member, 55th Japan Joint Automatic Control Conference
- **2012** Program Committee Member, 5th International Congress on Image and Signal Processing (CISP 2012)
- **2011–2017** Member of Technical Committee on Signal Processing (SIP), IEICE, Japan
- **2011** Organizing Committee Member, 26th IEICE Signal Processing Symposium (SIP2011)
- **2011** Program Committee Member, 54th Japan Joint Automatic Control Conference
- **2010–2014** Member of Technical Committee on Reliable Robust Radio Control Technology (RRRC), IEICE, Japan

- **2010** International Program Committee Member, International Symposium on Mathematical Theory of Networks and Systems (MTNS 2010)
- **2009–2013** Member of Editorial Board of Systems, Control and Information, ISCIE, Japan
- **2009–2010** Local Committee Member, YY Fest 2010
- **2009** Program Committee Member, CACS International Automatic Control Conference (IACC2009)
- **2004–2006** Member of Editorial Board of Systems, Control and Information, ISCIE, Japan
- **2004–2006** Local Committee Member, International Symposium on Mathematical Theory of Networks and Systems (MTNS 2006)

## Courses Taught

- **2019–present** Information Mathematics (The University of Kitakyushu, undergraduate level)
- **2019–present** Experiments in Information System Engineering III (The University of Kitakyushu, undergraduate level)
- **2019–present** Sparse Modeling (The University of Kitakyushu, graduate level)
- **2019–present** Introduction to Environmental Technology (The University of Kitakyushu, undergraduate level)
- **2017–2018** Applied Control Engineering (The University of Kitakyushu, graduate level)
- **2016–2018** Experiments in Information and Media Engineering III (The University of Kitakyushu, undergraduate level)
- **2016–present** Exercises in Programming II (The University of Kitakyushu, undergraduate level)
- **2016–2018** Exercises in Data Structures and Algorithms (The University of Kitakyushu, undergraduate level)
- **2016–2019** Image Processing (The University of Kitakyushu, graduate level)
- **2016–2018** Discrete Mathematics (The University of Kitakyushu, undergraduate level)
- **2012–2016** Topics in Control Theory (Kyoto University, graduate level)
- **2012–2016** Mathematical Description of Natural Phenomena (Kyoto University, undergraduate level)
- **2009–2016** Modern Control Theory (Kyoto University, undergraduate level)
- **2006–2016** Complex Systems Synthesis (Kyoto University, graduate level)
- **2013** Seminar on Data Analysis of Sound (Kyoto University, undergraduate level)
- **2013** System Analysis Laboratory (Kyoto University, undergraduate level)
- **2013** Linear Control Theory (Kyoto University, undergraduate level)
- **2005–2012** Numerical Analysis (Osaka University, undergraduate level)

- **2002–2012** Experiments in Applied Mathematics and Physics (Kyoto University, undergraduate level)
- **2004–2016** Seminar on Applied Mathematics and Physics (Kyoto University, undergraduate level)
- **2007** Experiments in Physics (Kyoto University, undergraduate level)
- **2005** Numerical Computation Seminar (Kyoto University, undergraduate level)

## Languages

- Japanese: **Native**   English: **Fluent**

## Citizenship

- Japanese

Last updated: December 31, 2019  
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