Daisuke **Inoue**

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About me

Daisuke Inoue is a researcher at Toyota Central R&D Labs,. Inc. He received a B.E. degree in engineering from Osaka University in 2014 and an M.S. degree in informatics from Kyoto University in 2017. He received a Ph.D. degree in mathematical science from the University of Tokyo in 2024. His current research interests include control engineering, multi-agent systems, and swarm intelligence.

Experience

Toyota Central R&D Labs., Inc. *Aichi, Japan*

Research Engineer *Aug. 2017 - Present*

- Controller design for very large-scale systems
- Exploring applications of quantum annealing machines for control engineering

Kyoto University *Kyoto, Japan*

Teaching Assistant *July. 2016 - Mar. 2017*

- Teaching Assistant of Complex Analysis Class

Siemens Industry Software N.V. *Leuven, Belgium*

Research Internship *July. 2015 - Mar. 2016*

- Motion Controller Design for Airbus A330 based on 1-D & 3-D Co-simulation

Mitsubishi Heavy Industries, Ltd. *Kobe, Japan*

Internship *July. 2014*

- Development of Nuclear Power Plant Simulator

Education

The University of Tokyo *Tokyo, Japan*

Ph.D student *Mar. 2024*

- Thesis: Numerical Methods for Nonlinear Partial Differential Equations Arising from Large-Scale Multi-Agent Control Problems

Kyoto University *Kyoto, Japan*

M.S. in Informatics *Mar. 2017*

- Thesis: Stability Analysis of Networked Monotone Systems

Osaka University *Osaka, Japan*

B.S. in Engineering *Mar. 2014*

- Thesis: Stationary performance evaluation of control systems with random dither quantization

Selected Publication

Journal (Refereed)

Traffic signal optimization in large-scale urban road networks: an adaptive-predictive controller using Ising models *IEEE Access*

D. Inoue, H. Yamashita, K. Aihara, and H. Yoshida *2024*

Partially Centralized Model-Predictive Mean Field Games for Controlling Multi-Agent Systems *IFAC Journal of Systems and Control*

D. Inoue, Y. Ito, T. Kashiwabara, N. Saito, and H. Yoshida *2023*

A fictitious-play finite-difference method for linearly solvable mean field games *ESAIM: M2AN*

D. Inoue, Y. Ito, T. Kashiwabara, N. Saito, and H. Yoshida *2023*

Traffic Signal Optimization on a Square Lattice with Quantum Annealing — *Scientific Reports*, *2021*
D. Inoue, A. Okada, T, Matsumori, K. Aihara and H. Yoshida

Optimal Transport-based Coverage Control for Swarm Robot Systems: Generalization of the Voronoi Tessellation-based Method — *IEEE Control Systems Letters*, *2020*
D. Inoue, Y. Ito and H. Yoshida

Model Predictive Control for Finite Input Systems using the D-Wave Quantum Annealer — *Scientific Reports*, *2020*
D. Inoue, H. Yoshida

Conference (Refereed)

Stability Analysis of Logit Dynamics with Committed Minority and Internal/External Conformity Biases — *Proc. 22nd IFAC World Congress*, *Yokohama, Japan, 2023*
T. Miyano, Y. Ito, D. Inoue, S. Koide, and T. Hatanaka

Model Predictive Mean Field Games for Controlling Multi-Agent Systems — *2021 IEEE International Conference on Systems, Man, and Cybernetics*, *Melbourne, Australia, 2021*
D. Inoue, Y. Ito, T. Kashiwabara, N. Saito, and H. Yoshida

Optimal Transport-based Coverage Control for Swarm Robot Systems: Generalization of the Voronoi Tessellation-based Method — *American Control Conference 2021*, *New Orleans, USA, 2021*
D. Inoue, Y. Ito and H. Yoshida

Stochastic Self-Organizing Control for Swarm Robot Systems — *ICSI 2019*, *Chiang Mai, Thailand, 2019*
D. Inoue, D. Murai, and H. Yoshida

Distributed Range-based Localization for Swarm Robot Systems using Sensor-Fusion Technique — *SENSORNETS 2019*, *Prague, Czech Republic, 2020*
D. Inoue, D. Murai, Y. Ikuta and H. Yoshida

Replay attack detection in control systems with quantized signals — *European Control Conference 2015*, *Linz, Austria, 2015*
K. Kashima and D. Inoue

Stationary performance evaluation of control systems with random dither quantization — *European Control Conference 2014*, *Strasbourg, France, 2014*
K. Kashima and D. Inoue

Awards

- 2024 **Dean's Award, Graduate School of Mathematical Sciences**, The University of Tokyo
- 2017 **Repayment Exemption for Students with Excellent Grades**, Japan Student Services Organization
- 2016 **Best presentation award on The 59th Japan Automatic Control Conference**, The Society of Instrument and Control Engineer
- 2015 **Research Encouragement Award on The 58nd Annual Conference of the Institute of Systems, Control and Information Engineers**, The Institute of Systems, Control and Information Engineers
- 2014 **Research Encouragement Award on The 1st Multi-symposium on Control Systems**, The Society of Instrument and Control Engineers

Grants

- 2015 **Vulcanus in Europe (15,540 dollars)**, Selected students get to go to Europe to study the local language, and to have a working experience by EU-Japan Centre for Industrial Cooperation in Institute for International Studies and Training.