

# Yuto Watanabe

*Ph.D. student @ University of California San Diego*

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## Research interests

Control theory; convex and nonconvex optimization; duality in fundamental control theory; networked systems.

## Education

Sept. 2024 – present	University of California San Diego Ph.D. student at the ECE department (GPA: 4.0/4.0) Advisor: Prof. Yang Zheng	📍 CA, USA
Apr. 2024 – Aug. 2024	Kyoto University Funded by the JSPS Research Fellowship for Young Scientists (DC1) Advisor: Prof. Toshiyuki Ohtsuka, Prof. Kazunori Sakurama	📍 Kyoto, Japan
Apr. 2022 – Mar. 2024	Kyoto University Master of Informatics (GPA: 3.9/4.0) Advisor: Prof. Kazunori Sakurama, Prof. Toshiyuki Ohtsuka	📍 Kyoto, Japan
Apr. 2018 – Mar. 2022	Kyoto University B.E. in Mechanical Engineering	📍 Kyoto, Japan

## Publications

### Journal articles

- J4. **Y. Watanabe**, S. Fushimi, and K. Sakurama, “Convex reformulation of LMI-based distributed controller design with a class of non-block-diagonal Lyapunov functions,” *IEEE Transactions on Automatic Control*, 2026 (accepted).
- J3. **Y. Watanabe** and K. Sakurama, “Distributed optimization of clique-wise coupled problems via three-operator splitting,” *IEEE Transactions on Automatic Control*, 2026 (accepted).
- J2. S. Fushimi, **Y. Watanabe**, and K. Sakurama, “Design of distributed controller for discrete-time systems via the integration of extended LMI and clique-wise decomposition,” *IEEE Control Systems Letters*, vol. 8, pp. 3171-3176, 2024.
- J1. **Y. Watanabe**, K. Sakurama, and H.-S. Ahn, “Gradient-based distributed controller design over directed networks,” *IEEE Transactions on Control of Network Systems*, vol. 11, no. 4, pp. 1998-2009, Dec. 2024.

## Peer-reviewed conference papers

- C4 **Y. Watanabe**, C.-F. Pai, and Y. Zheng, “Semidefinite programming duality in infinite-horizon linear quadratic games,” *the 64th IEEE Conference on Decision and Control (CDC)*, Rio de Janeiro, Brazil (accepted). <https://arxiv.org/abs/2504.02201>
- C3. **Y. Watanabe** and K. Sakurama, “Distributed optimization of clique-wise coupled problems,” in *the 62nd IEEE Conference on Decision and Control (CDC)*, Singapore, 2023, pp. 296–302.
- C2. **Y. Watanabe** and K. Sakurama, “Accelerated distributed projected gradient descent for convex optimization with clique-wise coupled constraints,” in *the 22nd IFAC World Congress*, Yokohama, Japan, 2023.
- C1. **Y. Watanabe** and K. Sakurama, “Distributed dynamic matching of two groups of agents with different sensing ranges,” in *the 61st IEEE Conference on Decision and Control (CDC)*, Cancun, Mexico, 2022, pp. 5916–5921.

## Papers under review

1. C.-F. Pai, **Y. Watanabe**, Y. Tang, and Y. Zheng, “Policy Optimization for Mixed  $\mathcal{H}_2/\mathcal{H}_{\infty}$  Control: Benign Nonconvexity and Global Optimality”, submitted to *Automatica* (under review).
2. **Y. Watanabe**, F.-Y. Liao, and Y. Zheng, “Policy Optimization in Robust Control: Weak Convexity and Subgradient Methods”, submitted to *ACC2026*. <https://arxiv.org/abs/2509.25633>
3. **Y. Watanabe** and Y. Zheng, ”Revisiting strong duality, hidden convexity, and gradient dominance in the linear quadratic regulator”, submitted to *SIAM Journal on Control and Optimization* (under review). <https://arxiv.org/abs/2503.10964>

## Awards

2025 **IEEE CSS Student Travel & Workshop Support Programs of CDC 2025**.

2024 **SCI Outstanding Student Presentation Award**, SCI'24, Osaka, Japan.

**SICE Outstanding Student Award**, the Society of Instrument and Control Engineers (SICE).

- This award is given to the first-rank student in the department every year.

**UC San Diego, ECE department fellowship.**

2023 **Funai Overseas Scholarship**.

- This scholarship will cover two years of graduate school tuition plus a stipend of 3,000USD a month for living expenses. (Only for the UK, it will cover three years.)

**JSPS Research Fellowship for Young Scientist (Tokubetsu Kenkyuin) DC1.**

- A governmental three-year fellowship for Ph.D. students at Japanese institutions. The acceptance rate is approximately 14.3%.

**IEEE CSS Student Travel & Workshop Support Programs of CDC 2023.**

**SCI Outstanding Student Presentation Award**, SCI'23, Kyoto, Japan.

**The 2023 ISCIE Young Investigators Award**, The Institute of Systems, Control and Information Engineers, Japan.

- This award is given to around five outstanding young researchers in the Japanese control community.

## Review experiences

IEEE Transactions on Automatic Control, IEEE Transactions on Control of Network Systems, IEEE Control Systems Letters, IEEE CDC, IEEE ACC.

## Experiences

Oct. 2022 – Aug. 2024 **Student Member** of Advanced Mathematical Science for Mobility Society. The joint project of Kyoto University and Toyota Motor Corporation.

Apr. 2022 – Jul. 2022 **Teaching Assistant** at Kyoto University, Kyoto Japan. Teaching assistant of the Practice of Basic Informatics Class.

Mar. 2022 – Nov. 2022 **Office Assistant** at Kyoto University, Kyoto Japan. Translation of a monograph on multi-agent control into Japanese.

## Skills

Languages English: IELTS (Academic) overall score: 7.5 (Jan 2024).  
Japanese: Mother tongue.

Coding MATLAB, Python, and L<sup>A</sup>T<sub>E</sub>X.

## Misc

- Hobbies: Running (my best time: 3:40:27 at Kyoto marathon 2023), juggling, Sci-fi novels, etc.
- I am a first-generation student. (Both my parents have neither a bachelor's degree nor higher.)