Yuto Watanabe

Ph.D. student @ University of California San Diego
y1watanabe[at]ucsd.edu. https://watanabeyuto.github.io/

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

J5. **Y. Watanabe** and Y. Zheng, "Revisiting strong duality, hidden convexity, and gradient dominance in the linear quadratic regulator," *SIAM Journal on Control and Optimization*, 2026 (accepted). https://arxiv.org/abs/2503.10964

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

C5 **Y. Watanabe**, F.-Y. Liao, and Y. Zheng, "Policy Optimization in Robust Control: Weak Convexity and Subgradient Methods", *American Control Conference 2026*. https://arxiv.org/abs/2509.25633 ***(The Best Student Paper Award Finalist)***

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," *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," *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," *the 61st IEEE Conference on Decision and Control (CDC)*, Cancun, Mexico, 2022, pp. 5916–5921.

Papers under review

1. **Y. Watanabe** and Y. Zheng, "Gradient Dominance in the Linear Quadratic Regulator: A Unified Analysis for Continuous-Time and Discrete-Time Systems." https://arxiv.org/abs/2602.22577

2. 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*.

Awards

2026 **The Best Student Paper Award Finalist**, American Control Conference 2026.

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, IFAC World Congress.

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 LaTeX.

Misc

- Hobbies: Running (my best time: 3:40:27 at Kyoto marathon), juggling, Sci-fi novels, etc.
- I am a first-generation student. (Neither of my parents has a bachelor's degree.)
- Courses I officially took at UCSD:
  ECE285 Game theory and Multiagent Systems (Prof. B. Touri), ECE285 Semidefinite and Sum-of-Squares Optimization (Prof. Y. Zheng), Math277A Nonsmooth Optimization (Prof. L. Ding), ECE250 Random Processes (Prof. P. Naghizadeh).