Curriculum Vitae: Dec, 2025

Hiroto Sato

Contact Information

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Education

March 2024	Ph.D. in Economics, The University of Tokyo, (*magna cum laude*)
March 2021	M.A.in Economics, The University of Tokyo
March 2019	B.A. in Economics Nagoya University

Research Interests

Information Economics, Social Learning, Search Theory, Information Design, Mechanism Design

Working Paper

"Managing Learning Structures" (coauthored with Ryo Shirakawa)

New!

We develop a simple model of a designer who manages a learning structure. Agents have partial private information about a common-value good. The designer wishes to allocate the good to as many agents as possible without using monetary transfers. We formulate this environment as a mechanism design problem that nests social learning models and characterize an optimal mechanism under general distributions over private information. The optimal mechanism can be summarized by two parameters: one purely adjusts the allocation probability, while the other governs the amount of learning implicitly induced by allocation. Although the designer always prefers to allocate the good, managing incentives for learning leads the optimal mechanism to withhold allocation even when allocation is socially efficient. Our analysis brings the perspective of managing learning structures to market design and introduces a mechanism design approach to social learning.

"Value of Information in Social Learning" (coauthored with Konan Shimizu)

R&R at *Journal of Economic Theory*

This study extends Blackwell's (1953) comparison of information to a sequential social learning model in which agents make decisions sequentially based on both private signals and observed actions of others. In this context, we introduce a new binary relation over information structures: an information structure is *more socially valuable* than another if it yields higher expected payoffs for *all* agents, regardless of their preferences. First, we establish that this binary relation is strictly stronger than the Blackwell order. Next, we provide a necessary

and sufficient condition for our binary relation and propose a simpler sufficient condition that is easier to verify.

"Feasible Search Behavior" (coauthored with Ryo Shirakawa)

Submitted.

Consider a situation wherein a decision maker sequentially searches for the best alternative among heterogeneous options with an arbitrary search order. The agent partially learns the value of an option when inspecting it. We characterize the set of all search behaviors which may arise under some information structure, which forms a polytope. Moreover, a single information structure induces all feasible search behaviors, which minimizes the agent's welfare among all information structures. Applications include information design and comparative statics.search.

"Persuaded Choice in Ordered Search" (coauthored with Ryo Shirakawa)

R&R at *Economic Theory*

In many economic situations, such as job search and online shopping, agents are sequentially searching for information to choose one of a few options. Information revealed through their search process affects the eventual choice outcomes of such economies. This study explores a Bayesian persuasion problem in Weitzman's (1979) ordered search models. We show that an optimal signal structure consists of three signals for any risk-neutral planner. Neither providing no information nor full information is optimal except for trivial cases. We further derive comparative statics results for the tight bounds of each option's chosen probability and find that Bayesian persuasion minimizes agents' welfare in many cases.

Publication

"Information Structures in College Admissions" (coauthored with Ryo Shirakawa)

Accepted at *Journal of Economic Behavior and Organization*.

Priority uncertainty is prevalent in practical matching markets. This study investigates the role of priority information structures in a simple decentralized college admissions model. The first main theorem characterizes equilibrium distributions of students across schools, which are implementable with a class of simple disclosure rules, cutoff signals. The cutoff signal induces an ex-ante fair allocation that is also the closest to being ex-post fair among the allocations achieving the same distribution. As an application, we consider an information design problem. The second main theorem shows that each equilibrium distribution is implementable as a unique equilibrium.

"Robust Implementation in Sequential Information Design under Supermodular Payoffs and Objective"

Review of Economic Design 2022
Review of Economic Design Nedim Okan Prize 2023

This paper studies sequential information design (Doval and Ely 2020) in which a designer can construct the

extensive form along with the information structure. In this framework, I investigate robust implementations against adversarial equilibrium selection, when players and the designer have a supermodular payoff function with dominant states and an outside option. The main results show that the optimal partially implementable outcome is fully implementable in sequential information design, which essentially coincides with the optimal partially implementable outcome in static information design. For economic applications such as global game of regime change, this paper proposes a way to robustly achieve the desired outcome in static information design by providing the extensive form and the information structure.

Awards & Grants

2024 - 2027	JSPS Research Fellowship for Young Scientists (PD), Japan Society for the Promotion of Science
2023	Review of Economic Design Nedim Okan Prize
2022-2024	JSPS Research Fellowship for Young Scientists (DC2), Japan Society for the Promotion of Science
2021-2024	Grant-in-Aid for JSPS Fellows, JSPS
2020-2024	World-leading Innovative Graduate Study of Advanced Economics, the University of Tokyo

Refereeing

Journal of Public Economic Theory, *Japanese Economic Review*

Teaching Experience

2020	Math Camp Day 4 (Dynamic Optimization), Graduate School of Economics *Instructor*
2020	Mathematics for Economics, Graduate School of Economics *Teaching assistant* for Prof. Akihiko Matsui (The University of Tokyo)

Presentations

2023	10th Annual Communication Theory Workshop, Waseda University
	Microeconomics Seminar, Nagoya university
	Japanese Economic Association Autumn Meeting, Kansai University
	Economics and Game Theory Seminar, Tokyo University of Science
2021	Microeconomics Seminar, The University of Tokyo

Biography

Birthday: January 27, 1997

Citizenship: Japanese