

Kenji ITAO



PROFILE

Theorist specializing in the study of human history by applying statistical physics, complex systems theory, and evolutionary principles. Focused on universal mechanisms that govern the formation of social structures, I develop simplified models of human interactions grounded in anthropological observations to simulate social dynamics and explore the emergence of social structures. Actively engaged in international academic collaboration, I organize the Asian Cultural Evolution seminar, fostering cross-disciplinary connections among global researchers. Committed to advancing understanding in cultural and social evolution through innovative research and global engagement.

CONTACT DETAILS

✉ k.itaou@gmail.com
☎ +81 80 3448 0617
🌐 researchmap.jp/kenji_itaou
@ ORCID: 0000-0002-2215-1120

SKILLS

- Python and c++ programming
- Expertise in statistical physics, complex systems theory, cultural evolution.
- In-depth knowledge of human history and cultural anthropology

EXPERIENCE

1. ASSOCIATED RESEARCHER in *Research Institute for Humanity and Nature* **2025-pres.**
2. SPECIAL POSTDOCTORAL RESEARCHER in *RIKEN, Center for Brain Sciences* **2024-pres.**
3. RESEARCH FELLOWSHIP FOR YOUNG SCIENTISTS in *Japan Society for the Promotion of Science* **2021-2024**
4. GUEST RESEARCHER in *Max Planck Institute for Evolutionary Anthropology* **2022-2024**
5. RESEARCH ASSISTANT in *World-leading Innovative Graduate Study Program of Advanced Basic Science Course, University of Tokyo* **2019-2024**

EDUCATION

- Ph. D. in Multidisciplinary Sciences, *University of Tokyo.* **2021-2024**
◇ Title: *Principles of the Emergence of Diverse Human Social Structures: Constructing Universal Anthropology.*
◇ Supervisor: Prof. Koji Hukushima.
◇ Statistical physics, Complex systems theory, Cultural evolution.
- M.A. in Multidisciplinary Sciences, *University of Tokyo.* **2019-2021**
◇ Title: *Multilevel Evolution of Families and Societies.*
◇ Supervisor: Prof. Kunihiko Kaneko.
◇ Statistical physics, Complex systems theory, Cultural evolution.
- B.A. in Department of Integrated Sciences, *University of Tokyo.* **2015-2019**

AWARDS

1. **YOUNG SCIENTIST INITIATIVE AWARD** from *Society of Evolutionary Studies, Japan* **2025**
2. **INOUE RESEARCH AWARD FOR YOUNG SCIENTISTS** from *Inoue Foundation for Science* **2025**
3. **YOUNG SCIENTIST AWARD** from *Physical Society of Japan* **2025**
4. YOUNG SCIENTIST PRESENTATION AWARD from *Human Behavior and Evolution Society Japan* **2024**
5. **IKUSHI PRIZE** from *Japan Society for the Promotion of Science* **2024**
6. ICHIKO MEMORIAL AWARD (PH.D.) from *University of Tokyo* **2024**
7. LOCAL STUDENT PRESENTATION AWARD from *Physical Society of Japan* **2022**
8. **PRESIDENT AWARD** from *University of Tokyo* **2021**
9. YOUNG SCIENTIST PRESENTATION AWARD from *Cultural Evolution Society* **2021**
10. **STUDENT PRESENTER AWARD** from *Anthropological Society of Nippon* **2021**
11. ICHIKO MEMORIAL AWARD (M.A.) from *University of Tokyo* **2021**
12. YOUNG SCIENTIST PRESENTATION AWARD from *Human Behavior and Evolution Society Japan* **2020**



PUBLICATIONS

1. Kenji Itao and Kunihiko Kaneko. “Self-organized institutions in evolutionary dynamical-systems games.” *Proceedings of the National Academy of Sciences* 122.15 (2025): 1–11.
2. Kenji Itao and Kunihiko Kaneko. “Emergence of economic and social disparities through competitive gift-giving.” *PLOS Complex Systems* 1.1 (2024): 1–16.
3. Kenji Itao and Kunihiko Kaneko. “Formation of human kinship structures depending on population size and cultural mutation rate.” *Proceedings of the National Academy of Sciences* 121.33 (2024): 1–9.
4. Kenji Itao and Kunihiko Kaneko. “Transition of social organizations driven by gift relationship.” *Humanities and Social Sciences Communications* 10.1 (2023): 1–10.
5. Kenji Itao and Kunihiko Kaneko. “Emergence of kinship structures and descent systems: multi-level evolutionary simulation and empirical data analysis.” *Proceedings of the Royal Society B* 289.1969 (2022): 1–10.
6. Kenji Itao and Kunihiko Kaneko. “Evolution of family systems and resultant socio-economic structures.” *Humanities and Social Sciences Communications* 8.1 (2021): 1–11.
7. Kenji Itao and Kunihiko Kaneko. “Reply to Read and Parkin: our model correctly expresses the ethnographic nature of the cultural incest taboo and kinship structures.” *Proceedings of the National Academy of Sciences* 117.17 (2020): 9167–9168.
8. Kenji Itao and Kunihiko Kaneko. “Evolution of kinship structures driven by marriage tie and competition.” *Proceedings of the National Academy of Sciences* 117.5 (2020): 2378–2384.
9. Kenji Itao, Fumiya Omata, Yoshitaka Nishikawa, Tetsuro Oda, Toshiharu Sasaki, Cherrri Zhang, John Solomon Maninang, and Takayuki Yamaguchi. “Threshold phenomena with respect to the initiation of depopulation in a simple model of foot-and-mouth disease.” *Mathematical Biosciences and Engineering* 16.5 (2019): 5931–5946.

GRANTS AND FELLOWSHIPS

1. SPECIAL POSTDOCTORAL RESEARCHER in *RIKEN, Center for Brain Science* (JPY 3,000,000) **2024–pres.**
2. RESEARCH FELLOWSHIP FOR YOUNG SCIENTISTS in *Japan Society for the Promotion of Science* (JPY 1,300,000) **2021–2024**
3. RESEARCH ASSISTANT in *World-leading Innovative Graduate Study Program of Advanced Basic Science Course* **2019–2024**

ACADEMIC OUTREACH AND SEMINAR ORGANIZATION

1. SERIALIZED ARTICLES “INVITATION TO UNIVERSAL ANTHROPOLOGY” (in Japanese) at *Gendai Business, Kodansha* **2024–pres.**
<https://gendai.media/list/author/kenjiitao>
2. ASIAN CULTURAL EVOLUTION SEMINAR **2024–pres.**
<https://sites.google.com/view/aceseminar/home>
3. INTELLIGENCE AND CULTURAL EVOLUTION THEORY SEMINAR **2023–pres.**
<https://sites.google.com/view/icetseminar/home>



INVITED PRESENTATIONS

1. Kenji Itao. "SELF-ORGANIZED INSTITUTIONS IN EVOLUTIONARY DYNAMICAL SYSTEMS GAMES" at *International Conference on "Cooperative Strategies and Dynamics in Social Systems: from Human to Insect Societies"* (ICMMA 2025) **2026**
2. Kenji Itao. "SELF-ORGANIZED INSTITUTIONS IN EVOLUTIONARY DYNAMICAL SYSTEMS GAMES" at *Dynamics Days* **2025**
3. "SELF-ORGANIZED INSTITUTIONS IN EVOLUTIONARY DYNAMICAL SYSTEMS GAME" at *APCTP/G-LAMP Workshop on the Roles of Heterogeneity in Nonequilibrium* **2025**
4. "INVITATION TO THE UNIVERSAL ANTHROPOLOGY" at *The Biophysics Summer School for Young Scientists in Japan* **2025**
5. "PRINCIPLES OF THE EMERGENCE OF DIVERSE HUMAN SOCIAL STRUCTURES" at *The Physical Society of Japan, Young Scientist Award Commemorative Lecture* **2025**
6. "SELF-ORGANIZED INSTITUTIONS IN EVOLUTIONARY DYNAMICAL SYSTEMS GAME" at *Niels Bohr Institute, Copenhagen University* **2024**
7. "TWO UNIVERSAL PATHWAYS IN DEMOGRAPHIC TRANSITION" (in Japanese) at *National Institute of Population and Social Security Research* **2024**
8. "EVOLUTION OF KINSHIP STRUCTURES THROUGH MARRIAGE INTERACTIONS" at *Collective Phenomena in complex systems: problems inspired by Ecology and Evolution* **2023**
9. "METHODS OF MATHEMATICAL MODELING FOR SOCIAL PHENOMENA" (in Japanese) at *Center for Experimental Research in Social Sciences, Hokkaido University* **2022**
10. "TRANSITIONS OF SOCIAL ORGANIZATIONS DRIVEN GIFT-GIVING INTERACTIONS" (in Japanese) at *Network Science Workshop* **2022**
11. "EXPLAINING UNIVERSALITY AND DIVERSITY IN SOCIAL PHENOMENA USING EVOLUTIONARY SIMULATION" at *Niels Bohr Institute, Copenhagen University* **2022**
12. "EXPLAINING UNIVERSALITY AND DIVERSITY IN SOCIAL PHENOMENA USING EVOLUTIONARY SIMULATION" at *Complexity Science Hub Vienna* **2022**
13. "MULTI-LEVEL EVOLUTIONARY SIMULATION FOR ANTHROPOLOGY AND DEMOGRAPHY" at *Max Planck Institute for Demographic Research* **2022**
14. "MULTI-LEVEL EVOLUTIONARY SIMULATION FOR EVOLUTIONARY ANTHROPOLOGY" at *Max Planck Institute for Evolutionary Anthropology* **2022**
15. "EMERGENCE OF SOCIAL STRUCTURES IN MULTI-LEVEL EVOLUTIONARY MODELS" (in Japanese) at *Institute of Statistical Mathematics* **2021**
16. "MULTI-LEVEL EVOLUTIONARY MODELLING OF FAMILIES AND SOCIETIES FOR ANTHROPOLOGICAL PHENOMENA" at *Max Planck Institute for Evolutionary Anthropology* **2021**
17. "MULTI-LEVEL EVOLUTION OF FAMILIES AND SOCIETIES REVEALS THE UNIVERSALITY IN ANTHROPOLOGICAL PHENOMENA" at *Mathematical geographical modelling for environmental humanities* **2021**
18. "NUMERICAL ANALYSIS OF DEADLINE OF INITIATION OF DEPOPULATION FOR FOOT-AND-MOUTH DISEASE CONTROL" at *Innovative Mathematical Modeling for the Analysis of Infectious Disease Data* **2017**