

Hirokazu Shirado

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Human-Computer Interaction Institute
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Professional experience

- 2019 – Assistant Professor
Human-Computer Interaction Institute; and
Societal Computing, Software and Societal Systems (affiliated faculty),
School of Computer Science,
Carnegie Mellon University, USA
- 2006 – 2014 Researcher
Intelligent Systems Laboratory, Sony Corporation, Japan
- 2011 – 2012 Visiting researcher
Department of Health Care Policy, Harvard Medical School, USA
- 2009 – 2011 Visiting researcher
Graduate School of System Design and Management, Keio University, Japan

Education

- 2019 Ph.D., Sociology
Yale University, USA
- 2018 M.A., MPhil, Sociology
Yale University, USA
- 2006 M.S., System and Mechanical Engineering
Keio University, Japan
- 2004 B.S., Mechanical Engineering
Keio University, Japan

Publications

Thesis

H. Shirado, Autonomous-agent interventions in human network cooperation and coordination.

Articles

H. Shirado, “Individual and collective learning in groups facing danger,” *Scientific Reports*, Vol. 12, No. 6210, doi:10.1038/s41598-022-10255-3, 2022.

E. Erikson and H. Shirado, “Networks, property, and the division of labor,” *American Sociological Review*, Vol. 86, No. 4, pp. 759-786, 2021.

H. Shirado and N.A. Christakis, “Network engineering using autonomous agents increases cooperation in human groups,” *iScience*, Vol. 23, No. 9, doi:10.1016/j.isci.2020.101438, 2020.

H. Shirado, F.W. Crawford, and N.A. Christakis, “Collective communication and behaviour in response to uncertain ‘Danger’ in scenario experiments,” *Proceedings of the Royal Society A*, Vol. 476, doi:10.1098/rspa.2019.0685, 2020.

H. Shirado, G. Iosifidis, N.A. Christakis, “Assortative mixing and resource inequality enhance collective welfare in sharing networks,” *PNAS: Proceedings of the National Academy of Science*, Vol. 116, pp. 22442-22444, 2019.

H. Shirado, G. Iosifidis, L. Tassiulas, N.A. Christakis, “Resource sharing in technologically defined social networks,” *Nature Communications*, doi:10.1038/s41467-019-08935-2, 2019.

H. Shirado and N.A. Christakis, “Locally noisy autonomous agents improve global human coordination in network experiments,” *Nature*, Vol. 545, pp. 370-374, 2017.

A. Nishi, H. Shirado, and N.A. Christakis, “Intermediate levels of network fluidity amplify economic growth and mitigate economic inequality in experimental social networks,” *Sociological Science*, Vol. 2, pp. 544-557, 2015.

A. Nishi, H. Shirado, D. Rand, and N.A. Christakis, “Inequality and visibility of wealth in experimental social networks,” *Nature*, Vol. 526, pp. 426-429, 2015.

H. Shirado, F. Fu, J.H. Fowler, and N.A. Christakis, “Quality versus quantity of social ties in experimental cooperative networks,” *Nature Communications*, Vol. 4, No. 2814, doi:10.1038/ncomms3814, 2013.

Y. Nonomura, T. Miura, T. Miyashita, Y. Asao, H. Shirado, et. al., “How to identify water from thickener aqueous solutions by touch,” *Journal of the Royal Society Interface*, doi:10.1098/rsif.2011.0577, 2011.

H. Shirado, M. Konyo, and T. Maeno, “Modeling of tactile texture recognition mechanism,” *Japan Society of Mechanical Engineers*, chapter C, Vol. 73, No. 733, pp. 2514-2522, 2007 (in Japanese).

H. Shirado, Y. Nonomura, and T. Maeno, “Development of artificial skin having human skin-like texture (Realization and evaluation of human skin-like texture by emulating surface pattern and elastic structure),” *Japan Society of Mechanical Engineers*, chapter C, Vol. 73, No. 726, pp. 541-546, 2007 (in Japanese).

H. Shirado and T. Maeno, “Modeling of texture perception mechanism for tactile display and sensor,” *Virtual Reality Society of Japan*, Vol. 9, No. 3, pp. 235-240, 2004 (in Japanese).

Conference proceedings

E. Erikson and H. Shirado, “Network structure and the division of labor,” *the Conference of the Society for the Advancement of Socio-Economics (SASE)*, 2019.

K. Nagasaka, A. Miyamoto, M. Nagano, H. Shirado, et. al., “Motion control of a virtual humanoid that can perform real physical interactions with a human, *IEEE/RSJ International Conference on Intelligent Robots and Systems*, pp. 2303-2310, 2008.

H. Shirado, Y. Nonomura, and T. Maeno, Realization of human skin-like texture by emulating surface shape pattern and elastic structure,” *Symposium on Haptic Interface for Virtual Environment and Teleoperator Systems*, pp. 295-296, 2006.

Y. Mukaibo, H. Shirado, M. Konyo and T. Maeno, “Development of texture sensor emulating the tissue structure and perceptual mechanism of human fingers,” *IEEE ICRA*, pp. 2576-2581, 2005.

H. Shirado and T. Maeno, “Modeling of human texture perception for tactile displays and sensors,” *World Haptics Conference*, pp. 57-58, 2005.

Books

M. Nakatani, Y. Kakehi, and H. Shirado, *Technology-Based Tactile Design*, Iwanami, 2011 (in Japanese).

Book chapters

H. Shirado and T. Maeno, *Tactile recognition mechanism and technology of tactile sensor and display*, Science & Technology, chapter 1, Vol. 3, 2010 (in Japanese).

Funding

2023 – 2028 “Using Machine Intelligence to Facilitate Intergroup Communication and Cooperation in Humans,” NSF CAREER (PI; \$450,738)

2020 – 2022 “Hybrid Human-AI Systems to Change Collective Behavior,” Robert Wood Johnson Foundation (Co-PI; \$42,832)

Awards and Honors

2023 NSF CAREER award

2022 Outstanding Article Publication Award, ASA Section on Mathematical Sociology

2020 Marvin B. Sussman Best Dissertation Award, Yale Sociology

2016 Seed Grant Program, The National Institute of Social Science, USA

- 2007 Incentive Award, Chemical Society of Japan
- 2005 Best Poster Award, World Haptics
- 2005 Scholarship Award, Japan Scholarship Foundation

Invited talks

- 2023 *Computational Social Science seminar*, MIT Media Lab, USA
- 2023 People + AI Research team, Google, USA
- 2022 *Computational Social Science seminar*, S3D, School of Computer Science, Carnegie Mellon University, USA
- 2022 Sony CSL, Japan
- 2022 Division of Psychology and Sociology, University of Tokyo, Japan
- 2022 Max Planck Institute of Animal Behavior and University Konstanz, Germany
- 2022 Max Planck Institute for Human Development, Germany
- 2022 *Human Nature Lab seminar*, Yale University, USA (Remote)
- 2021 *9th Computational Social Science*, Conference on Complex System, Lyon, France (Remote).
- 2021 *Civic AI Lab seminar*, University of Amsterdam, Netherlands (Remote).
- 2021 *CREST workshop*, University of Tokyo, Japan (Remote).
- 2021 *Human Nature Lab seminar*, Yale University, USA (Remote)
- 2021 *socialBRIDGES HCI conference*, Bundeswehr University Munich, Germany (Remote).
- 2020 *Kansai Social Psychology seminar*, Japan (Remote).
- 2020 *Center for Informed Democracy and Social-cybersecurity seminar*, Carnegie Mellon University, USA (Remote).
- 2020 University of Konstanz, Germany (Remote).
- 2020 Max-Planck Institute for Human Development, Germany (Remote).
- 2019 Princeton University, USA.
- 2019 Dartmouth College, USA.
- 2019 *ALIFE 2019*, Newcastle University, UK.
- 2019 *Workshop on Visualization and Control for Neural Dynamics*, National Institute for Physiological Science, Japan.
- 2018 *Conference on Artificial Intelligence and Social Science*, The University of Electro-Communications, Japan.
- 2018 *The 35th Annual Meeting of the Japanese Cognitive Science Society*, Ritsumeikan University, Japan.
- 2018 *Workshop on Collective Behavior, Social Media, and Systemic Risk*, Princeton University, USA.

- 2018 *Distributed, Collective Computation in Biological and Artificial Systems*, Howard Hughes Medical Institute, Janelia Research Campus, USA.
- 2017 *Association for the Advancement of Artificial Intelligence 2017 Spring Symposia*, Stanford University, USA.
- 2016 *Contexts of Social Inequality*, WZB Berlin Social Science Center, Germany.
- 2016 Graduate School of System Design and Management, Keio University, Japan.

Teaching: full courses offered

“Social Web,” Computer Science 05-320/820, Undergraduate and graduate course, Carnegie Mellon University, Spring 2020, 2021, 2022

“Social Data Science,” Computer Science 05-499/899-E, Undergraduate and graduate course, Carnegie Mellon University, Fall 2020, 2021

“Introduction to Human-Computer Interaction for Technology Executives,” Computer Science 05-863, Graduate course, Carnegie Mellon University, Fall 2022

“Social Perspectives in Human-Computer Interaction,” Computer Science 05-772, Graduate course, Carnegie Mellon University, Spring 2023

Service to profession

Intramural

2020-2021 Faculty Search Committee, Societal Computing, Institute for Software Research, Carnegie Mellon University

2021-2023 PhD Admissions Committee, Human-Computer Interaction Institute, Carnegie Mellon University

2022-2023 Award Committee, Human-Computer Interaction Institute, Carnegie Mellon University

Extramural

2019- Organizer, Summer Institute in Computational Social Science Tokyo site (SICSS-Tokyo)

2020- Member, Society for Computational Social Science of Japan

Ad-hoc reviews

American Sociological Review, European Sociological Review, IC2S2, iScience, Nature Communications, Nature Human Behavior, PLOS ONE, Science Advances, Scientific Reports, SIGCHI, IEEE Transactions on Network Science and Engineering

Extra training

2017 Summer Institute in Computational Social Science, Princeton University, USA

Media coverage

“Interdisciplinary case study: understanding the cooperation of humans and robots through the collaboration of social and computer scientists”, *iScience*, 2020

“Behaving better online”, *BBC*, 2018

“Bad bots do good: Random artificial intelligence helps people coordinate,” *Science*, 2017

“Pushy AI bots nudge humans to change behavior,” *Scientific American*, 2017

“Dumb robots that make mistakes actually help humans solve problems,” *The Verge*, 2017

“How bots acting randomly can help speed human problem-solving,” *Live Science*, 2017

“Working with robots helps people get along”, *Science of Us*, 2017

“Making the scene: inequality,” *PBS*, 2015

Languages

Fluent English

Native Japanese

References

Nicholas A. Christakis

Professor of Sociology, Medicine, and Ecology and Evolutionary Biology, Yale University

Co-director of Yale Institute for Network Science

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Emily Erikson

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