

RIKU ARAKAWA

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Ubiquitous Sensing, Computational Interaction, Human-AI Co-adaptation, Health

I study how ubiquitous but imperfect sensing (e.g., human activity recognition) can enable reliable AI assistants in the physical world to support human agency. I combine human-AI interaction design with computational models that adapt through interaction to overcome uncertainty in the system and the user. In collaboration with health experts, I design and deploy sensing-based assistants for real-world health and well-being contexts involving patients, caregivers, and clinicians.

EDUCATION

- 2021– Present** **Carnegie Mellon University, School of Computer Science**
Ph.D. student in Human-Computer Interaction Institute
Advisor: Dr. Mayank Goel
- 2019–21** **The University of Tokyo, School of Information Science and Technology**
M.S. in Information Physics & Computing (GPA 4.0/4.0, Dean's Award)
Advisor: Dr. Masahiko Inami
Thesis: *Mindless Computing through Auditory Intervention*
- 2015–19** **The University of Tokyo, School of Engineering**
B.E. in Mathematical Engineering & Information Physics (GPA 3.89/4.0)
Advisor: Dr. Hiroshi Saruwatari and Dr. Shoichi Koyama
Thesis: *DNN-Based Voice Conversion and Its Quality Improvements by Audio Data Augmentation*

SELECTED HONORS AND AWARDS

Research Fellowships and Grants

- 2024** Quad Fellowship
2023 Center for Machine Learning and Health Fellowship (CMU CMLH)
2022 Snap Research Fellowship
2022–26 Masason Foundation Scholarship
2021–22 Funai Overseas Scholarship
2021 Research Fellowship for Young Scientists (JSPS DC1)

Academic Honors and Awards

- 2026** ACM CHI Honorable Mention Award x2
2025 ACM UbiComp/ISWC Gaetano Borriello Outstanding Student Award
2025 ACM UbiComp/ISWC Best Doctoral Colloquium Contribution Award
2025 12th Heidelberg Laureate Forum
2024 ACM UbiComp/ISWC HASCA Workshop Best Paper and Presentation Awards
2023 ACM CHI Honorable Mention Award + Honorable Case Study Recognition
2021 ACM CHI Honorable Mention Award
2021 Dean's Award from The University of Tokyo
2020 ACM CHI Best Paper Award

Misc.

- 2025** MIT Technology Review Innovators Under 35 Japan (computing)
2024 Forbes Asia 30 under 30 (healthcare and science)

PUBLICATIONS

Peer-Reviewed Journal Papers

- [J.10] Prasoon Patidar, **Riku Arakawa**, Ricardo Graça, Rúben Moutinho, Adriano Soares, Ana Vasconcelos, Filippo Talami, Joana Couto da Silva, Inês Silva, Cristina Mendes Santos, Mayank Goel, Yuvraj Agarwal. *OrganicHAR: Towards Activity Discovery in Organic Settings for Privacy Preserving Sensors using Efficient Video Analysis*. **PACM IMWUT 2025 (UbiComp'26)**
- [J.9] **Riku Arakawa**, Manami Nakagawa, Hiromu Yakura. *UbiLearn: Supporting English-as-a-Foreign-Language Learners in Reflecting on Conversations Using a Smartwatch*. **PACM HCI 2025 (MobileHCI'25)**
- [J.8] **Riku Arakawa**, Kiyosu Maeda, Hiromu Yakura (equal contribution). *ConverSearch: Supporting Experts in Human Behavior Analysis of Conversational Videos with a Multimodal Scene Search Tool*. **ACM TiiS 2024**
- [J.7] **Riku Arakawa**, Jill Fain Lehman, Mayank Goel. *PrISM-Q&A: Step-Aware Voice Assistant on a Smartwatch Enabled by Multimodal Procedure Tracking and Large Language Models*. **PACM IMWUT 2024 (UbiComp'25)**
- [J.6] **Riku Arakawa**, Bing Zhou, Gurunandan Krishnan, Mayank Goel, Shree K. Nayar. *MI-Poser: Human Body Pose Tracking using Magnetic and Inertial Sensor Fusion with Metal Interference Mitigation*. **PACM IMWUT 2023 (UbiComp'23)**
- [J.5] **Riku Arakawa**, Karan Ahuja, Kristie Mak, Gwendolyn Thompson, Sam Shaaban, Oliver Lindhiem, Mayank Goel. *LemurDx: Using Unconstrained Passive Sensing for an Objective Measurement of Hyperactivity in Children with no Parent Input*. **PACM IMWUT 2023 (UbiComp'23)**
- [J.4] **Riku Arakawa**, Hiromu Yakura, Vimal Mollyn, Suzanne Nie, Emma Russell, Dustin P. Dimeo, Haarika A. Reddy, Alexander K. Maytin, Bryan T. Carroll, Jill Fain Lehman, Mayank Goel. *PrISM-Tracker: A Framework for Multimodal Procedure Tracking Using Wearable Sensors and State Transition Information with User-Driven Handling of Errors and Uncertainty*. **PACM IMWUT 2022 (UbiComp'23)**
- [J.3] Chengshuo Xia, Xinrui Fang, **Riku Arakawa**, and Yuta Sugiura. *VoLearn: A Cross-Modal Operable Motion-Learning System Combined with Virtual Avatar and Auditory Feedback*. **PACM IMWUT 2022 (UbiComp'22)**
- [J.2] Yohei Kiguchi, Melvyn Weeks, **Riku Arakawa**. *Predicting Winners and Losers under Time-Of-Use Tariffs Using Smart Meter Data*. **Energy 2021**
- [J.1] **Riku Arakawa**, Hiromu Yakura (equal contribution). *Reaction or Speculation: Building Computational Support for Users in Catching-Up Series Based on an Emerging Media Consumption Phenomenon*. **ACM CSCW 2021**



Peer-Reviewed Conference Papers

- [C.25] **Riku Arakawa***, Shreya Bali*, Anupama Sitaraman, Woosuk Seo, Sam Shaaban, Oliver Lindheim, Traci M. Kennedy, Mayank Goel (*: equal contribution). *CalmReminder: A Design Probe for Parental Engagement with Children with Hyperactivity, Augmented by Real-Time Motion Sensing with a Watch*. **ACM CHI 2026**
- [C.24] 🍷 Shreya Bali, **Riku Arakawa**, Peace Odiase, Sherry Wu, Mayank Goel. *Evidotes: Integrating Scientific Evidence and Anecdotes to Support Uncertainties Triggered by Peer Health Posts*. **ACM CHI 2026**
- [C.23] 🍷 Taejun Kim, Vimal Mollyn, **Riku Arakawa**, Chris Harrison. *HiFiGaze: Improving Eye Tracking Accuracy Using Screen Content Knowledge*. **ACM CHI 2026**
- [C.22] **Riku Arakawa**, Prasoon Patidar, Will Page, Jill Fain Lehman, Mayank Goel. *Scaling Context-Aware Task Assistants that Learn from Demonstration and Adapt through Mixed-Initiative Dialogue*. **ACM UIST 2025**
- [C.21] Haozhe Zhou, **Riku Arakawa**, Yuvraj Agarwal, Mayank Goel. *IMUCoCo: Enabling Flexible On-Body IMU Placement for Human Pose Estimation and Activity Recognition*. **ACM UIST 2025**
- [C.20] **Riku Arakawa**, Hiromu Yakura, Mayank Goel. *PrISM-Observer: Intervention Agent to Help Users Perform Everyday Procedures Sensed using a Smartwatch*. **ACM UIST 2024**
- [C.19] **Riku Arakawa**, Hiromu Yakura (equal contribution). *Coaching Copilot: Blended Form of an LLM-Powered Chatbot and a Human Coach to Effectively Support Self-Reflection for Leadership Growth*. **ACM CUI 2024**
- [C.18] **Riku Arakawa**, Mathieu Parvaix, Chiong Lai, Hakan Erdogan, Alex Olwal. *Quantifying the Effect of Simulator-Based Data Augmentation for Speech Recognition on Augmented Reality Glasses*. **IEEE ICASSP 2024**

- [C.17] **Riku Arakawa***, Hiromu Yakura*, Masataka Goto (*: equal contribution). *CatAlyst: Domain-Extensible Intervention for Preventing Task Procrastination Using Large Generative Models*. **ACM CHI 2023**
- [C.16] 🍷 Vimal Mollyn, **Riku Arakawa**, Mayank Goel, Chris Harrison, Karan Ahuja. *IMUPoser: Body Pose Estimation using Phones, Watches, and Earbuds*. **ACM CHI 2023**
- [C.15] Tianhong Catherine Yu, **Riku Arakawa**, James McCann, Mayank Goel. *uKnit: A Position-Aware Reconfigurable Machine-Knitted Wearable for Gestural Interaction and Passive Sensing using Electrical Impedance Tomography*. **ACM CHI 2023**
- [C.14] **Riku Arakawa**, Mayank Goel, Chris Harrison, Karan Ahuja. *RGBDGaze: Gaze Tracking on Smartphones with RGB and Depth Data*. **ACM ICMI 2022**
- [C.13] Kiyosu Maeda, **Riku Arakawa**, Jun Rekimoto. *CalmResponses: Displaying Collective Audience Reactions in Remote Communication*. **ACM IMX 2022**
- [C.12] **Riku Arakawa***, Hiromu Yakura*, Sosuke Kobayashi (*: equal contribution). *VocabEncounter: NMT-powered Vocabulary Learning by Presenting Computer-Generated Usages of Foreign Words into Users' Daily Lives*. **ACM CHI 2022**
- [C.11] **Riku Arakawa***, Hiromu Yakura*, Masataka Goto (*: equal contribution). *BeParrot: Efficient Interface for Transcribing Unclear Speech via Respeaking*. **ACM IUI 2022**
- [C.10] Iori Yanokura, Naoki Wake, Kazuhiro Sasabuchi, **Riku Arakawa**, Kei Okada, Jun Takamatsu, Masayuki Inaba, Katsushi Ikeuchi. *A Multimodal Learning-from-Observation Towards All-at-once Robot Teaching using Task Cohesion*. **IEEE/SICE SII 2022**
- [C.9] **Riku Arakawa**, Zendai Kashino, Shinnosuke Takamichi, Adrien Verhulst, Masahiko Inami. *Digital Speech Makeup: Voice Conversion Based Altered Auditory Feedback for Transforming Self-Representation*. **ACM ICMI 2021**
- [C.8] 🍷 **Riku Arakawa**, Hiromu Yakura (equal contribution). *Mindless Attractor: A False-Positive Resistant Intervention for Drawing Attention Using Auditory Perturbation*. **ACM CHI 2021**
- [C.7] Hideki Shimobayashi, Tomoya Sasaki, Arata Horie, **Riku Arakawa**, Zendai Kashino, Masahiko Inami. *Independent Control of Supernumerary Appendages Exploiting Upper Limb Redundancy*. **ACM AHs 2021**
- [C.6] Naoki Wake, **Riku Arakawa**, Iori Yanokura, Takuya Kiyokawa, Kazuhiro Sasabuchi, Jun Takamatsu, Katsushi Ikeuchi. *Learning-from-Observation Framework: One-Shot Robot Teaching for Grasp-Manipulation-Release Household Operations*. **IEEE/SICE SII 2021**
- [C.5] **Riku Arakawa**, Azumi Maekawa, Zendai Kashino, Masahiko Inami. *Hand with Sensing Sphere: Body-Centered Spatial Interactions with a Hand-Worn Spherical Camera*. **ACM SUI 2020**
- [C.4] **Riku Arakawa**, Hiromu Yakura (equal contribution). *Mimicker-in-the-Browser: A Novel Interaction Using Mimicry to Augment the Browsing Experience*. **ACM ICMI 2020**
- [C.3] **Riku Arakawa**, Hiromu Yakura (equal contribution). *INWARD: A Computer-Supported Tool for Video-Reflection Improves Efficiency and Effectiveness in Executive Coaching*. **ACM CHI 2020**
- [C.2] 🏆 Fabrice Matulic, **Riku Arakawa**, Brian Vogel, Daniel Vogel. *PenSight: Enhanced Interaction with a Pen-Top Camera*. **ACM CHI 2020**
- [C.1] **Riku Arakawa**, Hiromu Yakura (equal contribution). *REsCUE: A framework for REal-time feedback on behavioral CUEs using multimodal anomaly detection*. **ACM CHI 2019**

Peer-Reviewed Workshop/Poster/Demo Papers

- [W.11] 🏆 **Riku Arakawa**. *Health Assistants for Everyday Care: Reliable Human-AI Collaboration under Imperfect Sensing*. **ACM Ubicomp 2025 Doctoral Colloquium**
- [W.10] **Riku Arakawa***, Franklin Mingzhe Li*, Nandi Zhang, Mina Huh, Amy Pavel, Ryo Suzuki, Patrick Carrington, Yukang Yan (*: equal contribution). *Accessible Cyber-Physical Activities*. **ACM UIST 2025**
- [W.9] **Riku Arakawa***, Hiromu Yakura*, Kei Akuzawa, Shizuma Kubo (*: equal contribution). *AI for Meeting Minutes: Promises and Challenges in Designing Human-AI Collaboration on a Production SaaS Platform*. **ACM CHI 2025 Case Study**
- [W.8] 🏆 **Riku Arakawa**, Mayank Goel. *Unified Framework for Procedural Task Assistants powered by Human Activity Recognition*. **ACM Ubicomp 2024 HASCA workshop**

- [W.7]  **Riku Arakawa**, Hiromu Yakura (equal contribution). *AI for human assessment: What do professional assessors need?. ACM CHI 2023 Case Study*
- [W.6] **Riku Arakawa**, Hiromu Yakura (equal contribution). *Human-AI communication for human-human communication: Applying interpretable unsupervised anomaly detection to executive coaching. IJCAI 2022 CHAI workshop*
- [W.5] **Riku Arakawa**, Hiromu Yakura (equal contribution). *AI for human assessment: What do professional assessors need?. ACM CHI 2022 TRAIT workshop*
- [W.4]  **Riku Arakawa**, Yang Zhang. *Low-Cost Millimeter-Wave Interactive Sensing through Origami Reflectors. CHIIoT Workshop 2021*
- [W.3] **Riku Arakawa**, Shintaro Shiba (equal contribution). *Exploration of Reinforcement Learning for Event Camera using Car-like Robots. IEEE ICRA 2020 Unconventional Sensors in Robotics workshop*
- [W.2] **Riku Arakawa**, Shinnosuke Takamichi, Hiroshi Saruwatari. *Implementation of DNN-based real-time voice conversion and its improvements by audio data augmentation and mask-shaped device. The 10th ISCA Speech Synthesis Workshop*
- [Po.2] **Riku Arakawa***, Yudai Tanaka*, Hiromu Kawarasaki, Kiyosu Maeda (*: equal contribution). *BulkScreen: Saliency-Based Automatic Shape Representation of Digital Images with a Vertical Pin Array Screen. ACM TEI 2020 Work-in-Progress*
- [W.1] **Riku Arakawa**, Sosuke Kobayashi, Yuya Unno, Yuta Tsuboi, Shin-ichi Maeda. *DQN-TAMER: Human-in-the-Loop Reinforcement Learning with Intractable Feedback. IEEE ICRA 2019 RT-DUNE workshop*
- [Po.1] **Riku Arakawa**, Shinnosuke Takamichi, Hiroshi Saruwatari. *TransVoice: Real-Time Voice Conversion for Augmenting Near-Field Speech Communication. ACM UIST 2019 Poster*

PATENTS

- [Pa.9] Egocentric human body pose tracking. US 2024-0103610
- [Pa.8] Speech information extraction device and its program. JP 2024-008068 (7507528)
- [Pa.7] Video information retrieval device, method, program, and utilization method. JP 2023-142598 (7591311)
- [Pa.6] Vocabulary learning support system and program. JP 2022-068248
- [Pa.5] System and program. JP 2022-036531 (7288530)
- [Pa.4] Speech information document device. JP 2022-142035 (7223469)
- [Pa.3] Speech conversion device, speech conversion method, and speech conversion program. JP 2021-033129
- [Pa.2] Image sensor, image processing unit, image processing method, and program. JP 2020-198535 (7393851)
- [Pa.1] Monitoring equipment, monitoring system, monitoring method, and monitoring program. JP 2020-091527 (6867701)

ACADEMIC SERVICE

Organizing Committee

- 2027 ACM CHI Web Chair
- 2025 ACM UIST Paper Chair Assistant
- 2025 ACM CHI Paper Chair Assistant

Program Committee

- 2026 ACM CHI Computational Interaction Subcommittee
- 2025 ACM UbiComp/ISWC Posters and Demos Tracks + BeyondSound Workshop
- 2022–24 ACM CHI LBW

In addition, I constantly serve as an external reviewer for ACM CHI, UIST, IMWUT, UbiComp/ISWC, MobileHCI, CSCW, DIS, IEEE ICRA, ICASSP, *etc.* (150+)

TEACHING EXPERIENCE

- 2025** **Teaching Assistant @ Carnegie Mellon University**, Pennsylvania, USA.
Human-AI Interaction Using Sensing Systems (Dr. Mayank Goel and Dr. Yuvraj Agarwal)
- 2024** **Teaching Assistant @ Carnegie Mellon University**, Pennsylvania, USA.
Machine Learning and Sensing for Healthcare (Dr. Mayank Goel and Dr. Justin Chan)
- 2023** **Teaching Assistant @ Carnegie Mellon University**, Pennsylvania, USA.
Programming User Interface (Dr. Scott Hudson)
- 2019** **Teaching Assistant @ The University of Tokyo**, Tokyo, Japan.
First-Year Seminar for Natural Sciences Students: Virtual Reality (Dr. Atsushi Hiyama)

PROFESSIONAL EXPERIENCE

- 2024** **Research Intern @ Meta**, New York, USA.
Wearable AI research mentored by Dr. Julian Ramos and Dr. Eiji Hayashi
- 2023** **Research Intern @ Google**, California, USA.
Sound processing research mentored by Dr. Mathieu Parvaix and Dr. Alex Olwal [C.18]
- 2022** **Research Intern @ Snap**, New York, USA.
EMF sensing research mentored by Dr. Bing Zhou and Dr. Shree K. Nayar [J.6]
- 2020** **Research Intern @ HiLab**, Remote.
MM-wave interactive sensing research mentored by Dr. Yang Zhang [W.4]
- 2019–20** **Research Engineer @ Microsoft**, Tokyo, Japan.
Learning-from-Demonstration research mentored by Dr. Katsushi Ikeuchi [C.6, C.10]
- 2019** **Student Fellow Researcher @ Preferred Networks**, Tokyo, Japan.
Pen+Tablet interaction research mentored by Dr. Fabrice Matulic [C.2]
- 2017–18** **Project Engineer @ Preferred Networks**, Tokyo, Japan.
Interactive reinforcement learning research mentored by Dr. Sosuke Kobayashi [W.1]