

RIKU ARAKAWA

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RESEARCH INTEREST

My focus is on developing and evaluating high-impact human-centered systems. I believe interactions through sensing users' context ubiquitously and intervening them suitably are key for changing our daily lives in a pervasive manner. My recent works are across human behavior analysis, wearable sensing systems, human-AI collaboration, and persuasive technologies. I actively adopt wide spectrum of ML techniques for HCI, such as computer vision, speech processing (recognition and synthesis), and natural language processing.

EDUCATION

Carnegie Mellon University Pittsburgh, PA, USA; 2021.9 - Current

School of Computer Science, Human-Computer Interaction Institute, Ph.D. Program

Adviser: Dr. Mayank Goel

The University of Tokyo Tokyo, Japan; 2019.4 - 2021.3

M.S. in Information Physics & Computing; GPA 4.0/4.0, Dean's Award

Adviser: Dr. Masahiko Inami

Master thesis: *Mindless Computing through Auditory Intervention*

The University of Tokyo Tokyo, Japan; 2015.4 - 2019.3

B.E. in Mathematical Engineering & Information Physics; GPA 3.89/4.0

Adviser: Dr. Hiroshi Saruwatari and Dr. Shoichi Koyama

Graduation thesis: *DNN-Based Voice Conversion and Its Quality Improvements by Audio Data Augmentation*

AWARDS AND HONORS

Scholarship, Fellowship, and Grant-in-Aid

- 2022 Masason Foundation Scholarship
- 2021 Funai Overseas Scholarship
- 2021 Kuma Creator Scholarship
- 2021 INNO-vation Program, Ministry of Internal Affairs and Communications, Japan
- 2021 Research Fellowship for Young Scientists (DC1), Japan Society for the Promotion of Science
- 2020 TOYOTA / Dwango AI Scholarship
- 2020 Fixstars Scholarship
- 2019 NEC C&C Grant for Attending International Conferences
- 2018 IPA Mitou Advanced Program, Ministry of Economy, Trade, and Industry, Japan

Academic Awards

- 2021 CHI 2021 Honorable Mention Awards (top 5%)
- 2021 Dean's Award for Academic Achievement at The University of Tokyo.
- 2021 1st CHIIoT Workshop Best Paper Award (top 1)
- 2020 CHI 2020 Best Paper Awards (top 1%)
- 2019 Best Student Presentation Award, The Acoustic Society of Japan 2019
- 2015 Tokyo Governor's Award for Academic Grades

Programming and Science Competitions Awards (selected from 20+)

- 2019 International Virtual Reality Contest, Laval Virtual prize & Unity prize
- 2018 James Dyson Award; 1st prize in Japan
- 2017 Stanford Health Hackathon; 3rd prize and best design award
- 2014 Asian Science Camp; Math prize

PEER-REVIEWED JOURNALS

[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. In Proceedings of the ACM on Interactive Mobile Wearable Ubiquitous Technology, Ubicomp (2022).

[J.2] Yohei Kiguchi, Melvyn Weeks, **Riku Arakawa**. Predicting Winners and Losers under Time-Of-Use Tariffs Using Smart Meter Data. Energy 236 (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. In Proceedings of the ACM on Human-Computer Interaction, CSCW (2021).

PEER-REVIEWED CONFERENCES

[C.13] Kiyosu Maeda, **Riku Arakawa**, Jun Rekimoto. CalmResponses: Displaying Collective Audience Reactions in Remote Communication. In Proceedings of the 2022 International Conference on Interactive Media Experience (IMX'22), Hybrid Event Portugal, June 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. In Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems (CHI'22), Hybrid Event USA, Apr. 2022.

[C.11] **Riku Arakawa** (*), Hiromu Yakura (*), Masataka Goto (*: equal contribution). BeParrot: Efficient Interface for Transcribing Unclear Speech via Respeaking. In Proceedings of the 2022 International Conference on Intelligent User Interface (IUI'22), Virtual Event Finland, Mar. 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. In Proceedings of the 2022 IEEE/SICE International Symposium on System Integration (SII'22), Virtual Event Norway, Jan. 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. In Proceedings of the 2021 International Conference on Multimodal Interaction (ICMI'21), Montreal Canada, Oct. 2021.

[C.8] **Riku Arakawa**, Hiromu Yakura (equal contribution). Mindless Attractor: A False-Positive Resistant Intervention for Drawing Attention Using Auditory Perturbation. In Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems (CHI'21), Virtual Event Japan, May. 2021. 🏆 **Honorable Mention**

[C.7] Hideki Shimobayashi, Tomoya Sasaki, Arata Horie, **Riku Arakawa**, Zendai Kashino, Masahiko Inami: Independent Control of Supernumerary Appendages Exploiting Upper Limb Redundancy. In Proceedings of the Augmented Humans International Conference (AHs'21), Virtual Event Finland, Feb. 2021.

[C.6] Naoki Wake, **Riku Arakawa**, Iori Yanokura, Takuya Kiyokawa, Kazuhiro Sasabuchi, Jun Takamatsu, Katsush Ikeuchi: Learning-from-Observation Framework: One-Shot Robot Teaching for Grasp-Manipulation Release Household Operations. In Proceedings of the 2021 IEEE/SICE International Symposium on System Integration (SII'21), Virtual Event Japan, Jan. 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. In Symposium on Spatial User Interaction (SUI'20), Virtual Event Canada, Oct. 2020.

[C.4] **Riku Arakawa**, Hiromu Yakura (equal contribution). Mimicker-in-the-Browser: A Novel Interaction Using Mimicry to Augment the Browsing Experience. In Proceedings of the 2020 International Conference on Multimodal Interaction (ICMI'20), Virtual Event Netherlands, Oct. 2020.

[C.3] **Riku Arakawa**, Hiromu Yakura (equal contribution). INWARD: A Computer-Supported Tool for Video Reflection Improves Efficiency and Effectiveness in Executive Coaching. In Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems (CHI'20), Virtual Event USA, Apr. 2020.

[C.2] Fabrice Matulic, **Riku Arakawa**, Brian Vogel, Daniel Vogel. PenSight: Enhanced Interaction with a PenTop Camera. In Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems (CHI'20), Virtual Event USA, Apr. 2020.

🏆 **Best Paper**

[C.1] **Riku Arakawa**, Hiromu Yakura (equal contribution). REsCUE: A framework for REal-time feedback on behavioral CUES using multimodal anomaly detection. In Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems (CHI'19), Glasgow Scotland, May 2019.

PEER-REVIEWED POSTERS, WORKSHOPS, AND DEMOS

[W.5] **Riku Arakawa**, Hiromu Yakura (equal contribution). AI for human assessment: What do professional assessors need? To Appear at Workshop on Trust and Reliance in AI-Human Teams (CHI'22), Hybrid Event USA, Apr. 2022.

[W.4] **Riku Arakawa**, Yang Zhang. Low-Cost Millimeter-Wave Interactive Sensing through Origami Reflectors. 1st Workshop on Computer Human Interaction in IoT Applications, Virtual Event The Netherlands, Feb. 2021. 🏆 **Best Paper**

[W.3] **Riku Arakawa**, Shintaro Shiba (equal contribution), Exploration of Reinforcement Learning for Event Camera using Car-like Robots. International Conference on Robotics and Automation 2020 (ICRA'20) Workshop on Unconventional Sensors in Robotics, Virtual Event France, May 2020.

[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. In Adjunct Publication of the 14th International Conference on Tangible, Embedded, and Embodied Interaction (TEI'20), Sydney, Feb. 2020.

[Po.1] **Riku Arakawa**, Shinnosuke Takamichi, Hiroshi Saruwatari. TransVoice: Real-Time Voice Conversion for Augmenting Near-Field Speech Communication. In Adjunct Publication of the 32nd Annual ACM Symposium on User Interface Software and Technology (UIST'19), New Orleans, Oct. 2019.

[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. In Proceedings of the 10th ISCA Speech Synthesis Workshop (SSW'10), Vienna, Sep. 2019.

[W.1] **Riku Arakawa**, Sosuke Kobayashi, Yuya Unno, Yuta Tsuboi, Shin-ichi Maeda. DQN-TAMER: Human in-the-Loop Reinforcement Learning with Intractable Feedback. International Conference on Robotics and Automation 2019 (ICRA'19) Workshop on Human-Robot Teaming Beyond Human Operational Speeds and Robot Teammates Operating in Dynamic Unstructured Environments (RT-DUNE), Montreal, May 2019.

PATENT

[Pa.3] Speech conversion device, speech conversion method, and speech conversion program. JP

[Pa.2] Image sensor, image processing unit, image processing method, and program. JP/US

[Pa.1] Monitoring equipment, monitoring system, monitoring method, and monitoring program. JP

ACADEMIC SERVICE

Program Committee

CHI LBW '22

Reviewer (30+) / *: including special recognitions for outstanding reviews

CHI '21, '22* / LBW '20, '21, '22 / Interactivity '21

CSCW '20, '21

UIST '21

MobileHCI '22

ICRA '21

TEACHING EXPERIENCE

Teaching Assistant, The University of Tokyo

First-Year Seminar for Natural Sciences Students: Virtual Reality (undergraduate)

2019.4 – 2019.7

RESEARCH EXPERIENCE

Research Intern @ HiLab, UCLA

mm-wave interactive sensing research advised by Dr. Yang Zhang

Tokyo, Japan (remote); 2020.7 – 2021.1

Research Engineer @ Microsoft Development Co., Ltd.

NLP research for learning from demonstration advised by Dr. Katsushi Ikeuchi

Tokyo, Japan; 2019.10 – 2020.12

Student Fellow Researcher @ Preferred Networks, Inc.

pen + tablet interaction research advised by Dr. Fabrice Matulic

Tokyo, Japan; 2019.7 – 2019.9

Project Engineer @ Preferred Networks, Inc.

interactive reinforcement learning research advised by Dr. Sosuke Kobayashi

Tokyo, Japan; 2017.5 – 2018.10