

Topic-Setting Program to Advance Cutting-Edge

Humanities and Social Sciences Research

(Program Title)

## Progress Report

(Summary of Final Report)

[Interdisciplinary Research on Collaborative Arts with Audience: Analyzing  
Resonance of Light, Sound, and Body in Sociology, Aesthetics, and Engineering]

Core-Researcher: Keiichi Yamazaki

Institution: Saitama University

Academic Unit: Graduate School of Humanities and Social Sciences

Position: Professor

Research Period: FY 2018- FY 2021

## 1. Basic information of the research project

Research Area	Integration of Technological Innovation, Japanese Aesthetics and Sensibility
Project Title	Interdisciplinary Research on Collaborative Arts with Audience: Analyzing Resonance of Light, Sound, and Body in Sociology, Aesthetics, and Engineering
Institution	Saitama University
Core-Researcher (Name, Academic Unit & Position)	Keiichi Yamazaki, Saitama University, Graduate School of Humanities and Social Sciences, Professor
Project Period	FY 2018 - FY 2021
Appropriations Plan (¥)	FY 2018 2,000,000 JPY
	FY 2019 3,825,000 JPY
	FY 2020 3,150,000 JPY
	FY 2021 1,150,000 JPY

## 2. Purpose of research

This research aims to create a new art space and practice within it, where performers and audience can interact with each other through the resonance of light, sound, and bodies under the guidance of Japanese traditional culture. Moreover, this interdisciplinary research which studies the value of communal enjoyment of people involves researchers from the humanities and engineering. Sociology, aesthetics, study of Japanese culture and information science are integrated in this research to study the value of communal enjoyment. Through accessing and analyzing the data, the research aims to develop a new field of humanities and social sciences.

## 3. Outline of research (Including members of research)

Based on (1) sociology, (2) information science, (3) aesthetics, and (4) study of Japanese culture, the research aims to create a new art space and practice within it, where performers and audience can interact with each other through the resonance of light, sound, and bodies under the guidance of Japanese traditional culture. Moreover, researchers from the humanities and engineering conduct an interdisciplinary investigation into the value of communal enjoyment.

(1) From the perspective of ethnomethodology in sociology, the research focuses on the interaction between many people. Light, sound, and vibrations produced by (2) and (3) resonate with the body, so that performers, art, and audience can interact with each other. Moreover, interactions among the audience occur spontaneously. In this study, the sociological analysis focuses on these interactions to construct a new theory of interactive audience and appreciation.

(2) Besides light and sound, there is a system being developed through which the movements of the performers can be transmitted by sensors to the audience. The spectators are then able to control the light and vibrations emitted from the devices. In addition to the one-on-one sensing and resonance system between the performer and the audience, other systems are also being developed, including a system for sensing the

behaviors among groups of audience and a system for reflecting the devices from the audience and the performers. Furthermore, since the natural responses from the audience can be synchronized or not, a system that incorporates them into the performance on stage and the overall theater space is developed and realized for idol concerts and kabuki performances.

(3) Sachiko Kodama participates in this research using advanced technology to create interactive art. Kodama's work in which magnetic fluid changes in response to the sound and movements of the audience, are highly acclaimed worldwide. They are seen as an expression of light and shadow, black and white, which reflects Japanese aesthetics. This research expresses the beauty ideals of traditional Japanese crafts via an experimental exhibition area and through that reflects Japanese sensibility, such as color and light. The Japanese art space with resonance of light, sound, and body is created through integration of Kodama's art with the devices developed in (2) and (4) the culture of light and shadow in kabuki.

(4) The space is created with kabuki and contemporary pop cultural performances in mind, in which light and shadow, performers and audience can interact. Although the audience's shouting is considered a cacophonous interruption of the performance in other cultures, it is an integral part of traditional Japanese theatre culture and the aim was to integrate this into contemporary art performances.

Japanese culture and sensibility together with physical resonance in (2) are studied in the research for creating a new Japanese culture and sensibility.

This research is conducted by 4 groups:

Group 1 analyzes the interaction between the audience, stage, and art (Keiichi Yamazaki, Keiko Ikeda, Akiko Yamazaki). Group 2 focuses on the interactive technology development and experiment (Yoshinori Kobayashi, Yoshinori Kuno, Hisato Fukuda, Makoto Katsurada). Group 3 is about interactive art and exhibition (Toshino Iguchi, Yukiko Kato, Sachiko Kodama, Takemi Kuresawa). Group 4 is looking at the historical and social analysis of Japanese art space/ audience interaction (Tove Bjoerk, Kikuko Toyama, Takayuki Hioki, Ryusuke Seike).

#### **4. Results and outcomes of the research**

The results of this research are published in the following three formats in collaboration between Saitama University and University of Electro-Communications: (1) stage performance of the Japanese "*New Taketori Monogatari*", (2) International symposium "Art, Museum, and Interaction in the Age of Pandemics", and (3) a series of books on liberal arts.

As for (1), the Japanese stage performance "*New Taketori Monogatari*" was performed on March 7, 2021. The play was monitored by the following 4 groups: group 1 for analyzing the interaction between the audience, stage and art, group 2 for interactive technology, group 3 for interactive art and exhibition (Sachiko Kodama, University of Electro-Communications group), and group 4 for historical and social analysis of Japanese artistic space cooperating with audience.

##### **1) Development of devices for remote interactive experiments in a brewery on traditional Japanese arts**

Based on the communication and visualization of the individual behaviors of group members, we have developed an assistant system to promote the internal connections. The remote communication support system can acquire and present a variety of information to different situations, no matter if it is a crowded space in real time or a dispersed one consisting of scattered individuals online.

The system aims to solve the problem that an audience can lose the sense of being on site or coexisting

physically when communicating with many people online. For example, a penlight-type device is used to color pictures that accentuate scenes in the story. In addition, certain words in the story float as strips of paper on the screen, and the audience can participate in the performance by touching these strips with the penlight-type device. When the audience touches a strange or interesting word, an impromptu storytelling can be performed by the professional *rakugo* performer using the strip's keyword. A new theatrical experience is created, in which the audience, whether local or remote, can participate in the scenes and the stage.

## **2) Performance of "New *Taketori Monogatari*", a remote stage on the theme of traditional Japanese performance art in a brewery**

The experimental play "New *Taketori Monogatari*" explores a new aspect of the relationship between the performers and the audience by examining the relationship between theater and geisha entertainment, using the latest information technology. Starting from an episode of Princess Kaguya's suitor, the work talks about the expansion of time and space, the web of relationships expanded through trade, and the social issue of how to respond to a world going through an irreversible transformation. We used the space of Ogose Brewery as the stage. In this space, there are 5 performers who do their monodrama simultaneously. The audience can watch in any order they like and communicate with the performer in any way they wish. This way of using space is based on traditional festivals which are the origin of Japanese theater and underground theater that developed in the latter half of the 20th century. It attempts to see what can happen if the audience are freed from chairs in modern theater.

Through digital devices, the five performers manage to communicate and cooperate with the audience on site and online. Performers can choose their own style of communication. Two performers chose the community style through which the performer communicates with the audience as an individual, rather than a role. The style allowed them to communicate with the audience on site but had little effect on the work itself. One performer let the interaction with the audience affect his acting to some extent, and two actors chose to improvise according to the signal the audience emitted. These two last instances showed that true co-creation between performers and audience is possible.

As for (2), on March 26, 2021, the international symposium "Art Museum and Interaction in the Age of Pandemic" was held together by the 4 groups, including the group for the analysis of the interaction between the audience, stage and art, the group for the development and experiment of interactive technology, the group for interactive art and exhibition (Saitama University) (Sachiko Kodama, University of Electro-Communications Group), and the group for historical and social analysis of Japanese art space/ audience interaction (Speech 7, 8, 9, 10). Moreover, we presented a sociological analysis of the interaction between the audience and exhibits taking examples from Japan, England, and France. We also discussed the differences in the way people appreciate art in museums comparing Europe and Japan. The topic that how museums respond to pandemic situations (remote viewing, use of archives, etc.) was also discussed and compared internationally.

As for (3), in "Production and Aesthetic Analysis of Interactive Art " (Saitama University) (University of Electro-Communications), the members in the aesthetics department conducted historical and aesthetic exploration while involving sociology and natural science (Paper 4, 5, 6, 7, 8).

The results of the research were also published or presented orally at international conferences of information technology and aesthetics (Paper 1,2, Speech 2, 3, 4, 5, 6).

The results are listed as follows:

## ○Book (1)

- ① Keiichi Yamazaki, Toshino Iguchi, and Shiho Hasegawa, “*Studies in Liberal Arts, vol.13: Collaborative Constructions of Arts with Audience I*”, Faculty of Liberal Arts, Saitama University 2021.3.31

## ○Paper (9)

- ① Yukiko Kato, “Between Life and Non-Life: Sachiko Kodama’s Black and Bridget Riley’s Pink”, *ICA 2019 Belgrade - 21st International Congress of Aesthetics Proceeding*, 2019, pp.1462-1467. (published as the best paper on *AM Journal of Art and Media Studies* (vol. 19 (Contemporary Aesthetics of Visual Arts)),: 109-115. 2019/09)
- ② Shiho Hasegawa, “A Study of Biological Concept in Architectural Thoughts: A Comparison between ‘Der Raum als Membran’ (1926) and ‘Metabolism’ (1960)”, *ICA 2019 Belgrade - 21st International Congress of Aesthetics Proceeding*, 2019, pp.1981-1990. (to be published on *Serbian Architectural Journal* as a selected paper)
- ③ Hikaru Furukawa, Jinglong Yuan, Ichen Chen, Keiichi Yamazaki, “A survey of university students' music experience as idol fans”, *Saitama University review. Faculty of Liberal Arts No.55 (2)*, 2020, pp.237-258. (Japanese)
- ④ Toshino Iguchi, “*Fusion of Colored Light and Music in the Media Art History: Ždeněk Pešánek and Alexander László*”, Keiichi Yamazaki, Toshino Iguchi, and Shiho Hasegawa, “*Studies in Liberal Arts, vol.13: Collaborative Constructions of Arts with Audience I*”, Faculty of Liberal Arts, Saitama University 2021.3.31, p.9-24
- ⑤ Sachiko Kodama, “On Dazzling – Magnetic Fluid Sculpture”, Keiichi Yamazaki, Toshino Iguchi, and Shiho Hasegawa, “*Studies in Liberal Arts, vol.13: Collaborative Constructions of Arts with Audience I*”, Faculty of Liberal Arts, Saitama University 2021.3.31, p.25-30
- ⑥ Yukiko Kato, “Between Life and Non-life: Sachiko Kodama’s Black and Bridget Riley’s Pink”, Keiichi Yamazaki, Toshino Iguchi, and Shiho Hasegawa, “*Studies in Liberal Arts, vol.13: Collaborative Constructions of Arts with Audience I*”, Faculty of Liberal Arts, Saitama University 2021.3.31p.31-40
- ⑦ Takemi Kuresawa, “Food” and “Energy” in problem-solving type Expo: From the viewpoint of media representation, Keiichi Yamazaki, Toshino Iguchi, and Shiho Hasegawa, “*Studies in Liberal Arts, vol.13: Collaborative Constructions of Arts with Audience I*”, Faculty of Liberal Arts, Saitama University 2021.3.31, p.41-54
- ⑧ Shiho Hasegawa, “A Study of the Biological Concept in Architectural Thought: A Comparison Between ‘Der Raum als Membran’ (1926) and ‘Metabolism’ (1960)”, Keiichi Yamazaki, Toshino Iguchi, and Shiho Hasegawa, “*Studies in Liberal Arts, vol.13: Collaborative Constructions of Arts with Audience I*”, Faculty of Liberal Arts, Saitama University 2021.3.31, p.55-68
- ⑨ Hisato Kobayashi、 Sachiko Kodama, “Tevrin: Development of sound and interactive CG generation system as an instrument using a 3D motion sensor”, *Information Processing Society of Japan (Proceeding)*, pp.579-581、 2021/3/12.

## ○Speech (10)

- ① Yoshinori Kobayashi, “Practical Human Behavior Sensing and Its Application to Interactive Systems”, Technical Committee on Smart Info-media Systems (SIS), IEICE technical report vol.119 no.458, SIS2019-48, 2020, pp.63-66. [Invited Speech]
- ② Toshino Iguchi, “Originality and Cultural Identity in Graphic Design Between Globalism and Localism”, ICA 2019 Belgrade - 21st International Congress of Aesthetics (2019/7/22-26, University of Belgrade) [Oral Speech]
- ③ Yukiko Kato, “Between Life and Non-Life: Sachiko Kodama’s Black and Bridget Riley’s Pink”, ICA 2019 Belgrade - 21st International Congress of Aesthetics (2019/7/22-26, University of Belgrade) [Oral Speech]
- ④ Shiho Hasegawa, “A Study of Biological Concept in Architectural Thoughts: A Comparison between ‘Der Raum als Membran’ (1926) and ‘Metabolism’ (1960)”, ICA 2019 Belgrade - 21st International Congress of Aesthetics (2019/7/22-26, University of Belgrade) [Oral Speech]
- ⑤ Negar Kaghazchi, Sachiko Kodama, Masakatsu Kaneko: A Digital Picture Book Prototype with a Freely Navigable Interface: Focusing on the Role of Visual Cues in Storytelling, NICOGRAPH2019 (2019/11/2~4, Nagoya City University) [Oral Speech]
- ⑥ Akiko Yamazaki and Keiichi Yamazaki, “Social Interaction with visitors: mobile guide robot/s in museum”, Video Conference, The Ecole du Louvre and the UQAM network (2020/11/12, The Louvre, Orsay, Centre Pompidou among others) and Canadian researchers and curators (MBAM)),
- ⑦ Yukiko Kato, Toshino Iguchi, Kayin Chen, “Eye Trackers and the Sense of Reality: An Experiment in Watching Interactive Art”, Art Museum and Interaction in the Age of Pandemic, (2012/03/26, Saitama University)
- ⑧ Sachiko Kodama, Tove Björk, Yoshinori Kobayashi, “Art appreciation via the Internet: Focusing on remote viewing experiments of plays directed by new media art”, Art Museum and Interaction in the Age of Pandemic, (2012/03/26, Saitama University)
- ⑨ Akiko Yamazaki, Keiichi Yamazaki, “Mobility and appreciation”, Art Museum and Interaction in the Age of Pandemic, (2012/03/26, Saitama University)
- ⑩ Yusuke Arano, “Recruited Guiding”, Art Museum and Interaction in the Age of Pandemic, (2012/03/26, Saitama University)

## ○Patents (3)

- ① INFORMATION TRANSFER REINFORCEMENT SYSTEM (Japanese Patents)  
[Inventors] KUNO YOSHINORI, OTSU KOYO, TAKAHASHI HIDEKAZU, FUKUDA HISATO, KOBAYASHI YOSHINORI, YAMAZAKI KEIICHI, MARUI TOMOTAKA  
[Application number] 2017-243919 (Dec.20,2017)  
[Publication number] 2019-080894 (May.30,2019)  
[Registration number] 6531257 (May 30,2019)
- ② PRESENTATION DEVICE AND PRESENTATION METHOD FOR INFORMATION TRANSFER FIELD USING SIMILARITY BETWEEN PERFORMER MOTION/VOICE AND AUDIENCE MOTION/VOICE (Japanese Patents)  
[Inventors] KUNO YOSHINORI, OTSU KOYO, TAKAHASHI HIDEKAZU, FUKUDA

HISATO, KOBAYASHI YOSHINORI, YAMAZAKI KEIICHI, MARUI TOMOTAKA

[Application number] 2018-084602(Apr.25,2018)

[Publication number] 2019-080899(May 30,2019)

[Registration number] 6531258(May 31,2019)

③LIGHT EMITTING DEVICE OPERATION COMPARISON METHOD AND LIGHT EMITTING  
DEVICE OPERATION COMPARISON SYSTEM(Japanese Patents)

[Inventors] KUNO YOSHINORI, OTSU KOYO, TAKAHASHI HIDEKAZU, FUKUDA

HISATO, KOBAYASHI YOSHINORI, YAMAZAKI KEIICHI, MARUI TOMOTAKA

[Application number] 2018-162218(Aug.31,2018)

[Publication number] 2020-035245(Mar.05,2020)

○Others (1)

① Performance Video, “ Shin-*Taketori Monogatari*”, 2021/3/7.

HP : <https://newtaketori.web.fc2.com/>