Research and Development Area of "Human and Information Ecosystem"
Research and Development Project Post-Evaluation Report

May 2024

Research and Development Project Name: Emotional AI in Cities: Cross Cultural Lessons from UK and Japan on Design for An Ethical Life

Principal Investigator: Peter Mantello (Professor, School of Asia Pacific Studies, Ritsumeikan Asia Pacific University).

Implementation Period: January 2020 to September 2023

A. Overall Evaluation

Evaluated as satisfactory.

Artificial intelligence (AI) is rapidly changing the way we work and live. One of the fastest-growing areas is called Emotional AI (EAI), which can sense, read, and evaluate human emotions. Emotional AI can be found in various applications such as cars, airplanes, classroom materials, smart toys, home assistants, online meetings, emails, social media, advertising kiosks, drive-through fast food menus, empathetic chatbots for online mental health consultation, care robots, and public and private security systems.

Emotional AI is designed to allow AI to read emotions by collecting unconscious response data such as heart rate, breathing, blood pressure, body temperature, voice tone, language choice, galvanic skin response (sweating due to psychological or physiological arousal like fear or stress, appearing as sweat gland activity in response to sympathetic nervous system activity), head and eye movements, and walking from biosensors, videos, conversations, and texts. However, emotions and styles of emotional expressions are not universal and can be influenced by culture, gender, ethnicity, and temporal/spatial factors.

This research project was driven by three research questions. First, in a world where emotional AI has been introduced, what steps are needed to enhance adaptability and social acceptance on the part of humans? Second, what is necessary for emotional AI to coexist ethically and harmoniously in diverse cultural and cross-border environments across various fields? Third, how can insights from the research be incorporated into regulatory and policy discussions about the role of emotional AI in future societies, and more specifically, the role of emotional AI in the culture of the societies to which it applies?

To address these three questions, this research project conducted a comparative study between Japan and the UK, focusing on societal surveillance, privacy, the conflict between freedom and security, corporate social responsibility, misinformation, information manipulation by citizens, governance, and the role of emotional AI in society. Eight milestones (stages) were established to guide the research. Furthermore, as part of this and future research projects, the overarching goal is to reconstruct the framework for technology and ethics, traditionally led predominantly by the United States, from the perspectives of both Japan and the UK. The above is an overview of this research project.

The goal of defining an ethically sound life coexisting with Emotional AI is highly important, and promising results were anticipated. However, based on the completion report of the research project and referenced papers, it seems that the investigation, analysis, and discussion have remained somewhat superficial so far. It is unfortunate that there is a lack of intriguing new discoveries or innovative insights. Further research is expected to deepen our understanding in this area. Understanding cultural differences in Emotional AI between Japan and the UK and proposing governance, guidelines, regulations, and business models based on these insights are major expectations for this research project. Achieving these goals is expected through further research in the future. Furthermore, in the future, it is advisable to set the creation of intellectual properties as part of the operational policy for upcoming research projects. The intellectual properties comprise discussing insights and challenges from the research project with stakeholders in administration, law, corporations, healthcare, etc., leading to dialogues with society and the general public. Due to the challenges of the COVID-19 pandemic, there were limited interactions with other projects in the HITE area. The unsatisfactory level of communication with other projects in the HITE program may have influenced the operational policy of the project and left the above-stated challenges for the future.

With regard to the descriptions of the research completion report of the research project, it is regrettable that the descriptions of respective surveys and discussions were just abstract and did not fully express the connection among the specific survey results, the implications that can be read from the results, and the insights described in the last part of the report. Also, there was no discussion on the different types of emotional recognition AI, such as natural language processing, speech recognition, facial expression recognition, and other elemental technologies. These will be issues for future research.

However, many academic papers have been produced as a result of this research project, which is highly commendable. Furthermore, it seems that this research project has made an important contribution to the HITE area in terms of its international significance.

While it may be challenging to grasp the raw outcomes obtained in respective work packages solely from descriptions in the research completion report, the successful publications of papers in reputable research journals suggest that satisfactory achievements have been made by the research project.

B. Item Evaluation

I.   Research and Development Project's Research and Development Content and its Results

1. The adequacy of the goals

Evaluated as adequate.

Implementing Emotional AI in society greatly affects our lives. Therefore, developing, managing, and adapting Emotional AI according to regional and cultural differences are crucial challenges. The framing of the problem to understand cultural differences in Emotional AI between Japan and the UK and establishing governance based on it is adequate. The eight milestones set in the project to initially grasp the current state of Emotional AI in Japan and the UK are also valid. Additionally, focusing on the perspectives of surveillance and privacy is also valid. However, the goals and scopes of the research project would have been much clearer if the differences between the prior collaborative research conducted by the principal investigator in Japan and the UK until 2019 (Emotional AI Lab, collaboration with Andrew McStay) and the progress made in this research project were explicitly explained.

2. Operation and activity status of the research and development project

Evaluated as appropriately conducted.

It is commendable that appropriate action was taken to some extent in addressing COVID-19, such as holding ZOOM meetings, and that a variety of research approaches were taken in each of the eight stages, including surveys for students and the public, interviews with businesses, and policy workshops. However, it is unclear how the results of the interviews conducted with major AI-related companies both domestically and internationally have been summarized and stated in the research completion paper. In this regard, achieving more appropriate project management is desired in future research activities. Furthermore, it is challenging to ascertain from the completion report's description whether the research progressed as planned in both Japan and the UK and how mutual activities were linked and influenced each other. Regarding future research, there is hope for more in-depth discussions to persist between Japan and the UK, taking into consideration historical backgrounds, especially in the realm of "cross-cultural research."

3. The status of achieving the goals and research and development outcomes of the research and development project

Evaluated as satisfactory.

The fact that 28 academic papers and 22 conference reports, both domestic and international, have been produced with great vigor is highly commendable. However, it is difficult to evaluate thoroughly due to the lack of clear relevance in each paper. Additionally, there was considerable expectation for concrete policy proposals, such as determining whether there are differences in the acceptance of Emotional AI between Japan and the UK, whether these differences stem from cultural disparities or algorithmic distinctions, and what governance should be established based on these findings. However, it appears that the research project did not achieve that level of specificity within its duration. The recognition targets of "Emotional AI" are categorized into text, speech, facial expressions, physiological information, etc. A comprehensive summary has been provided regarding the key considerations in information gathering and societal implementation. However, a disappointing aspect is that the definition of "Emotional AI" itself is not necessarily clear, and differences based on underlying technologies are not explicitly mentioned. Perhaps due to the ambiguity in this definition, the discussion seems to be limited to the general concept scope of AI, and the distinct development of discussions specific to this "Emotional AI" project is not adequately perceived. It is deemed crucial for future research projects to address these points more explicitly and to inquire about cultural differences between Japan and the UK. Furthermore, in the citizen workshop, there were interesting attempts such as exploring the reactions of participating citizens using narratives created based on Design Fiction (Design Fiction involves fictional prototypes and narrative worlds to give credibility to design ideas, examples include the iPad-like tablet device in the movie '2001: A Space Odyssey' and the 'Voight-Kampff empathy test' in 'Blade Runner'). However, having details about the results obtained and the analyses conducted as a case study would have been helpful. Is there a consensus among scientists on fundamental aspects such as what emotions are and how their expression differs culturally? If there is no consensus, can emotions be effectively addressed through AI computation? It is commendable that several important points were raised, such as the vulnerability of this current science of emotions, and it is expected that a more comprehensive and in-depth level of consideration will be provided in the future.

4. Potential for the Application and Expansion of Research and Development Achievements

Evaluated as potentially hopeful yet limited.

Given that emotional AI products have already been developed and the industry is growing, it is likely that the results of research in this area will be used in the future. However, research in emotional

AI is a crucial topic with significant potential for a broader impact on society. Unfortunately, this project alone has not yielded such crucial outcomes. We look forward to further research activities in the future. In addition, if the findings accumulated through academic research are made available as universally applicable concepts and analytical frameworks or as data sets, empirical fields, and research networks, it would make a significant contribution to future research in this field.

II.   Contributions to the Research and Development Project's Area

The activities and results of the research project are evaluated to have contributed satisfactorily to the goals of HITE research area.

How to live ethically well with Emotional AI and how to effectively utilize it, especially in cultures with diverse histories like Japan and the UK, are significant issues for the goals of the area. Considering security and potential malicious use, including them in the scope was a valuable contribution to the entire research area. However, it is unclear which papers each of the five insights at the end of the project's completion report is based on. Organizing the relationship between findings and insights from research results is the preferred step in this regard. The research and investigation on the current situation and measures related to emotional AI in our country could be improved for better accuracy. The impact of this research project and future studies on the societal acceptance of AI technology in Japanese society is a subject left to be explored in future research.

Research and Development Area of Human and Information Ecosystem
Results of Post-evaluation of Research and Development Projects in FY2023 (Summary)

The following post-evaluation was conducted for the research and development projects in the research area of "Human and Information Ecosystem" of the Social Technology Research and Development Project.

1. Research and Development Project
The following projects were the subject of evaluation. [7 items]
(Project adopted in 2017) Yoshida PJ (October 2017 - March 2021)
(Project adopted in 2018) Shoji PJ (October 2018 - March 2024)
(Project adopted in 2019) Mantello PJ (January 2020 - September 2023)
                          Inatani PJ (January 2020 - September 2023)
                          Sumida PJ (January 2020 - December 2023)
                          Nagase PJ (January 2020 - December 2023)
                          Yamamoto Beverley Anne PJ (January 2020 - December 2023)

2. Evaluation process
The evaluation was conducted using the following procedure:
・January 2024 Creation of evaluation materials ・Submission of "Completion Report"
・January 2024 ・Pre-evaluation
・January 29, 2024
        and January 31   Interview evaluation
・February 2024   Review of the Evaluation Report (Draft)
・March 2024   Finalization of the Evaluation Report
Confirmation of factual inaccuracies and undisclosed information in the evaluation report content was conducted with the principal investigator and others

3. Evaluation criteria
The evaluation results were summarized into an "evaluation report" based on the following evaluation criteria.
A. Overall Evaluation
B. Item Evaluation

(1) Research and Development Project's Research Content and Results
    (1) Validity of Objectives
    (2) Operation and Utilization Status of the Research and Development Project
    (3) Achievement Status of the Research and Development Project Goals and Research and Development Results
    (4) Potential Utilization and Expansion of Research and Development Results
(2) Contribution to the Area of Research and Development Projects

4. Evaluator (Affiliation and Position as of the Post-Evaluation Implementation)
<Program Supervisor>
Jiro Kokuryo   Professor at the Faculty of Policy Management, Keio University
<Deputy Program Supervisor>
Hideaki Shiroyama   Professor at the Graduate Schools for Law and Politics Faculty of Law, The University of Tokyo
<Advisors>
Kazuhiko Kato   Vice President and Executive Director (General Affairs, Human Resources and Information Infrastructure), University of Tsukuba
Koichi Kume   Professor at the Faculty of Economics, Toyo University
Yasuko Kono   Director, Japan Consumer's Association
Kaoru Sunada   Chief Researcher, International University of Japan Center for Global Communications, International University of Japan
Yukihiro Nobuhara   Honorary Professor, The University of Tokyo
Hitoshi Matsubara   Professor at the Graduate School of Information Science and Technology, The University of Tokyo
Tsuyoshi Maruyama   Professor and Visiting Researcher at the Research and Development Initiative, Chuo University
Fumihiro Murakami   Presidential Fellow, Digital Media and Data Strategy Group, Mobility and Communications Division, Mitsubishi Research Institute, Inc
Yuko Murakami   Professor at the Graduate School of Artificial Intelligence and Science, College of Arts, Rikkyo University
<Evaluation Specialist Advisor>
Kumi Okuwada   Visiting Professor at the Japan Advanced Institute of Science and Technology (JAIST)