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FY2021 Annual Report for International Joint Research with Research Fund
International Joint Digital Archiving Center for Japanese Art and Culture (ARC-iJAC), Art Research Center, Ritsumeikan University

Date (year/mm/dd): 2022/04/22

1. Title of the Research Project	
Development of contents processing methods for archiving “how to create” and “how to enjoy” towards comics and *animes*	
2. Research Leader	
Name	Organization and title
Ryosuke Yamanishi	Associate Professor at Faculty of Informatics, Kansai University, Japan

3. Co-researcher (Total： 9 persons)	
Name	Organization and title
Susumu Nakata	Prof. at Dept. of Info. and Sci., Ritsumeikan University, Japan
Mitsunori Matsushita	Prof. at Faculty of Informatics, Kansai University, Japan
Yoko Nishihara	Prof. at Dept. of Info. and Sci., Ritsumeikan University, Japan
Yoshihisa Fujita	Assist. Prof. at Dept. of Info. and Sci., Ritsumeikan University, Japan
Lieu-Hen Chen	Assoc. Prof. at National Chi Nan University, Taiwan
Wei-Ta Chu	Prof. at National Cheng Kung University, Taiwan
Takeshi Sakaki	R&D manager at Hottolink, Inc.
Hiroichiro Ishiwata	Auditor at Hottolink, Inc.
Takahiro Ozawa	Comic artist

4. Overview of the Research Project (About 150 words) Note: If you have changed your project since the time of application submission, please write clearly where you made changes.

This project aims to archive comics (i.e., mangas) and anime, known as one of the most famous and popular Japanese cultures and industries, as digital data. The target is not only materials themself but also creators' skills, unwritten knowledge, and experience to enjoy those entertainments.

To tackle this, we gather some computational approaches from different research fields. We develop fundamental techniques for archiving storyline, drawing skills, and interface for retrieving such contents. The storyline is the essential point of comics and animes, and it is crucial to model the dynamics of the story and characters act in the story to represent the story in a particular form. Drawing is now shifting from handwriting to 3D form in creating animes. However, the attractiveness of handwriting drawing is still unrevealed, and the skills would be disappeared without any mathematical modeling shortly. We mathematically model the handwriting drawing and try to figure out the attractiveness of Japanese legacy animes. After archiving the contents, we must need the interface to retrieve them. We focus on the contents and how to enjoy them to develop the interface for the retrieval systems.

This research project is content-oriented for comics and animes. Every single subtask has a specific design for comics and animes.

5. Overview of the Research Results Note: We may use this section for the Center's PR.

We developed several methods designed for each target of archives: storyline (Fig.1) and drawing skills (Fig. 2.) Also, we developed an interface for retrieving stories to avoid encountering spoilers.

We presented the results at domestic symposiums in Japan. Furthermore, some selected results were presented in reviewed international conferences and published as a reviewed journal paper. We have achieved one reviewed journal paper, three reviewed international conference papers, and five domestic symposium papers.

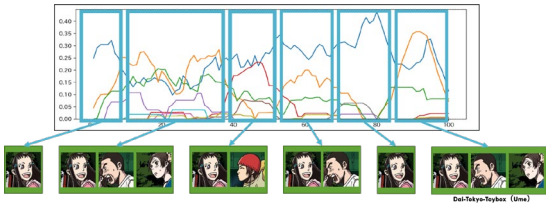

Fig. 1 The storyline and active characters at the point of the story.

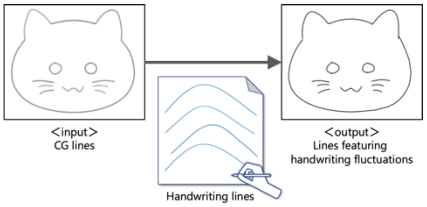

Fig. 2 A method to feature the CG lines with handwriting fluctuational features.

6. Research Activities

(1) Books
(2) Articles
- Japanese Language Listening Practice Support Using Dialogue Scenes of Anime with Estimated Levels; June 2021; The Journal of the Society for Art and Science, Vol.20, No.2, pp.108–119, Junjie Shan, Yoko Nishihara, Ryosuke Yamanishi, Akira Maeda; peer-reviewed
- Support Interface for Retrieving Comic Contents using Characters' Appearance Frequencies; accepted; Journal of Japan Society for Fuzzy Theory and Intelligent Informatics, Yoko Nishihara, Kaifeng Lei, and Ryosuke Yamanishi; peer-reviewed

(3) Presentations
[Reviewed Intl' Conference]
- Kodai Imaizumi, Ryosuke Yamanishi, Yoko Nishihara, and Takahiro Ozawa, Estimating Groups of Featured Characters in Comics with Sequence of Characters' Appearance, International Joint Workshop on Multimedia Artworks Analysis and Attractiveness Computing in Multimedia 2021, 2021.
- Yoko Nishihara, Jiaxiu Ma, Ryosuke Yamanishi, A Support Interface for Remembering Events in Novels by Visualizing Time-series Information of Characters and their Existing Places, HCI International 2021, pp.76-87, 2021.
- Ryosuke Yamanishi, Riona Mori, Mitsunori Matsushita: Representation of Characters' Directed-relationships in Comics with Speech-roles, Proc. of the 25th International Conference on Knowledge Based and Intelligent Information and Engineering Systems, pp.1541-1549, 2021

[Domestic Conference] (in Japanese)
- 青山千泰, 山西良典, 吉田光男, 石渡広一郎：SNS 上でシェアされる愛読者による漫画広告の基礎的な分析, 芸術科学会全国大会 NICOGRAPH2021, 2021
- 中島 楓華, 山西 良典 , 巽 優人 , 藤田 宜久, 仲田 晋 :アニメキャラの顔パーツの位置バランスとキャラクタ属性の関係性に関する基礎検討, 第 6 回コミック工学研究会, 2021
- 宮川栞奈, 松下光範: 異なる作品間のキャラクタの関係を比較するための相関図可視化システム, 第 14 回データ工学と情報マネジメントに関するフォーラム, F23-5, 2022.
- 樋口亮太, 山西良典, 松下光範：単語の頻度と意味に基づいたコミックに関するテキスト情報源の特性分析, 第 14 回データ工学と情報マネジメントに関するフォーラム, E21-2, 2022
- 三橋 力綺, 藤田 宜久, 山西 良典, 仲田 晋：CG 線画に手描き線の特徴を反映させる試み, 第 7 回コミック工学研究会 pp.1-4, 2022
- 山西良典, 西原陽子, 松下光範：語彙の標本化と量子化によるあらすじの特性表現に関する基礎検討, 第 7 回コミック工学研究会, 2022

(4) Symposiums and/or research meeting you organized
(5) Other research activities (Lectures to the general public, and appearances in/contributions to mass media)
(6) Academic awards
(7) Grants-in-Aid for Scientific Research -KAKENHI
(8) Competitive grants other than KAKENHI
(9) Other achievements