Development Report:

Manzai Robots: Entertainment Robots Based on Auto-Created Manzai Scripts from Web News Articles

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This paper introduces manzai robots – entertainment robots that automatically create manzai scripts from Internet articles based on keywords given by the audiences and perform manzai based on created manzai scripts. The robot consists two robots connected to the Internet that automatically create manzai scripts from Web news articles in response to a user's keywords using data mining and manzai techniques. After manzai scripts are created, the two robots perform manzai using these scripts. This paper reviews the robot system configuration, manzai script creation, and robot-based management.

Keywords: manzai robots, manzai script, data mining, Web

Fig. 1. Manzai robots. Left: ii-1, Ai-chan. Right: ii-2, Gonta.

1. Introduction

An aging society requires the extension of healthy life expectance and improvements in the quality of life of older people. It is thus essential that members have a certain amount of communication to improve their quality of life. Robots that encourage smooth communication are actively developed in this context [1, 2] Communication robots activate human-robot interaction to achieve this purpose. It has been reported that observation of dialogue between robots encourages the people to communicate with the robots naturally and smoothly [3]

This paper introduces manzai robots – entertainment robots that automatically create manzai scripts from Internet articles based on a user's keywords and that perform manzai based on the manzai scripts thus created. This study aims to facilitate the observation of the entertaining dialogue using manzai robots as a socially passive medium and to overcome disinterest in news based on manzai scripts using current topics [4, 5] We focus on scripts with manzai contents and show the feasibility of the of manzai robots as the content generator.

2. Manzai Robot System

2.1. System Configuration

The manzai robot system we propose performs manzai in two steps. First, the user enters a keyword and the system searches and obtains articles related to the keyword through the Web. Second, the system automatically transforms news article contents into manzai scripts. Robots then perform these scripts as a manzai show. The user enters one or more words such as "Tokyo" or "Tokyo Olympic" in the same manner as Web users do when searching through the Web.

Manzai robots in this study are shown in **Fig. 1** The taller robot ii-1, Ai-chan, which is about 100 cm tall, performs the role of *tsukkomi* – the straight man – and the shorter one ii-2, Gonta, which is about 50 cm tall, performs the role of *boke* – the stooge.

Tsukkomi and *boke* have fixed their own roles. Each has a computer on its back and the two communicate via a wireless LAN. The computer on ii-1 is a server connected to the Internet that directly obtains articles and automatically creates manzai scripts.

Each of these two robots has the following functions:

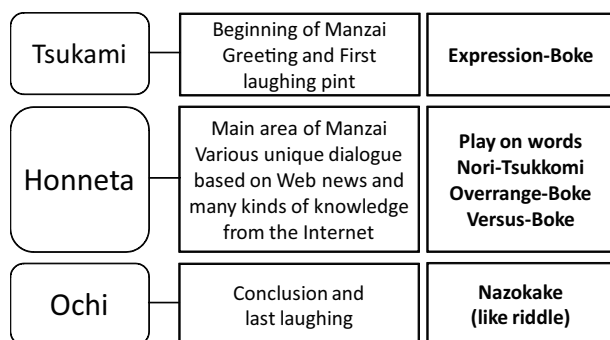1. Locomotion and rotation using mobile robot platforms Pioneer 3-DX (Mobile Robots, Inc.).

Fig. 2. Manzai structure functions.

Fig. 3. Example of created manzai scripts, originally in Japanese Italics are part of the Web news article and underlining is created by using conflicts in keywords obtained from search results.
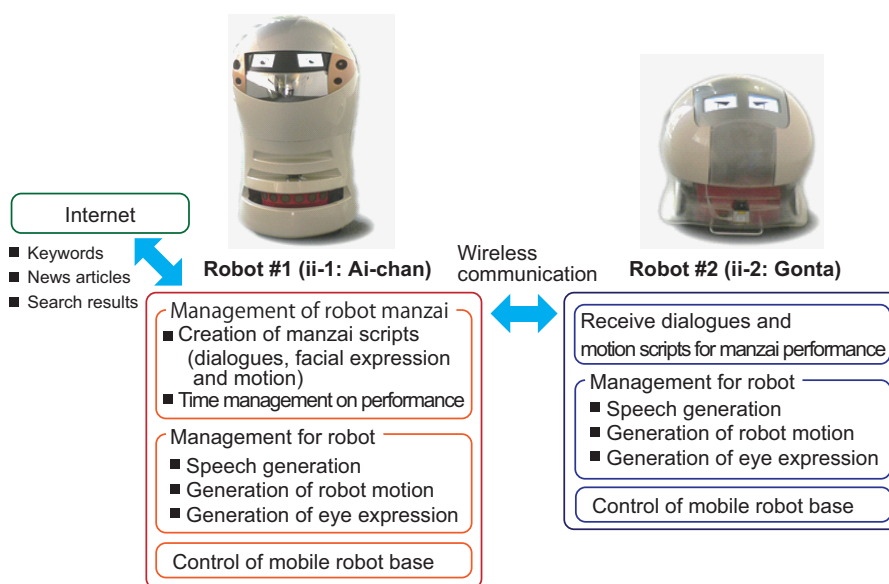

Fig. 4. Manzai robot management system configuration.

2. Creation of facial expressions by switching images on the eye display.

3. Speaker emission of a synthesized script-based voice.

The system manages operations using these functions.

2.2. Automatic Creation of Manzai Scripts

Before automatic creation, scripts must be formalized to some extent. This study uses the automatic script creation framework [6] proposed by Nadamoto et al. This creates three-part manzai scripts – *tsukami*, *honneta*, and *ochi*. This study focuses on dialogue-based manzai using funny dialogues which consists of *boke* and *tsukkomi*. *Boke* is like the stooge and *tsukkomi* is the straight man.

Specifically, the system obtains Web news articles based on user keywords and automatically creates a script. **Fig. 2** shows *tsukami*, *honneta*, and *ochi* functions. Especially, the *honneta* part includes component of four

types used to generate funny dialogues which are "exaggeration," "word-mistake," "nori-tsukkomi," and "rival-mistake." We create these funny dialogue by using Wikipedia and other web pages. **Fig. 3** presents a session of dialogue between *boke* and *tsukkomi* in an automatically created manzai script.

2.3. Management of Manzai Scripts

Figure 4 presents the manzai performance configuration. The PC mounted on ii-1 creates manzai scripts, time flows and manzai performance schedules. The PC mounted on ii-2 communicates with the PC on ii-1, receiving instructions on lines, motions, and expressions to create data for robot motion and speech.

After scripts are created, the two robots perform script-based manzai. The manzai script progress management program running on the PC on ii-1 decides information on the next lines to be spoken, facial expressions, and motions based on the progress of the script. When it is the

turn of ii-2 to perform, this information is transmitted to the PC on ii-2.

On receiving the information, the operation program running on the PC creates synthesized voices, facial expression changes, and robot motions as needed. Facial expressions change automatically corresponding to emotions and expressions and eye movement making up facial expressions. Robots operated based on operation commands sent to mobile robot platforms. After finishing motions that are operated by driving the robot mechanism, termination information is sent to the script progress management program of the PC mounted on ii-1. The manzai script progress management systems moves to the next session of the manzai script based on the information.

Through the above steps, the system steadily performs automatically created manzai based on manzai scripts.

3. Conclusion

This paper has introduced manzai robots, which automatically create manzai scripts from Internet articles based on user keywords and perform manzai based on these created scripts. We have focused on scripts, which are manzai contents, and discussed the potential and use of manzai robots as the content generator using the automatic script creation function. We have verified its potential by implementing an automatic manzai script creation system and a management system used on real robots.

Future challenges include multifunctional manzai management using a software module, and the verification of effects of the manzai robot system.

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