

# TV Show Template for Text Generated TV

Naoya Tsuruta, Takehiro Teraoka, Kunio Kondo

School of Media Science  
Tokyo University of Technology  
Tokyo, Japan  
{tsurutany, teraokatkh, kondo}@stf.teu.ac.jp

Masaki Hayashi

Department of Game Design  
Uppsala University  
Visby, Sweden  
masaki.hayashi@speldesign.uu.se

**Abstract**—The technique which converts text-based document into a TV show like computer graphics animation has been developed. However, writing a scripting language requires a variety of knowledge on TV shows such as speech timing, camera angle, lighting and so on. In this paper, we propose TV show template that contains animation settings imitating a particular type of TV show and semi-automatic animation generation using it.

**Keywords**—animation, text visualization, media conversion, scripting language

## I. INTRODUCTION

User-generated content (UGC) has become widespread through social media websites or services like blog. Users share photos, videos, texts which they have made on the Internet. Not only the social services, but the software for editing and creating them contributed to the popularization of UGC.

Computer graphics animation is one of UGC we can see on the social websites. There are various types of representation in the animation. It is still difficult to create a TV show like animation by the novice user because it requires knowledge of lighting, camera switching and the studio set. In order to support the creation of it, the technique that enables to create a TV show like CG animation automatically from text-based document have been developed [1]. The document generation process consists of the following two steps.

1. Convert text data fetched from the website into an intermediate file corresponding to the script of the TV show.
2. Convert an intermediate file into a TV program Making Language (TVML) document [2] by adding information of speech timing, camera angle, studio set, character motion and so on.

An animation can be reproduced from a TVML document by the TVML engine. However, second conversion step is manually and requires a variety of knowledge on TV show design.

## II. RELATED WORK

Automatic generation of animation is one of large topic in the field of computer graphics. Various techniques which simulate the natural phenomena using physics-based models

have been developed. A recent computer animation system based on these techniques helps the animator to create the natural scenes for the animation product.

Automatic generation of a story animation is a different challenge. A story animation requires a storyline in chronological order. Nadamoto and Tanaka tried to convert web contents into various types of story animation using TVML [3]. The character agent speaks the entire text of web content. We introduce a text summarization into the conversion process from web contents.

Piwiek et al. proposed a method for generating dialogue from text [4]. Some of the news program and the educational program use the dialog style with two commentators. Dialog style animation with two characters can be generated by converting a dialog text into Multimodal Presentation Markup Languages 3D (MPML3D) [5]. MPML3D has a similar concept to TVML. MPML3D focuses on how to control agents interaction and TVML focuses on how to mimic existing TV shows.

## III. OUR PROPOSED METHOD

In this paper, we propose TV show template and semi-automatic animation generation method from web contents. Figure 1 shows conversion mechanism with templates in the automatic animation generation process. The text data fetched from the website are summarized and converted into an intermediate file. Then, TV show template is used to convert it into TVML document. Each template has different animation setting imitating a particular type of TV show. We can watch the same contents in the different forms by changing the template to use, for example, a news content as a news program and as an educational program. Finally, an animation is reproduced from a TVML document by TVML engine.

### A. Summarization of text data from the web

To obtain text data from the web, we built a simple crawler that collected blog entries by the School of Media Science of Tokyo University of Technology and scraped their titles and texts. Each text body of the blog was too long for the character to speak, so it was summarized automatically before converting to each intermediate file. To summarize the text body, we employed the Basic Summarization Model [6]. This is a word-based summarization model which calculates the optimum score for selecting salient sentences with the probability of a

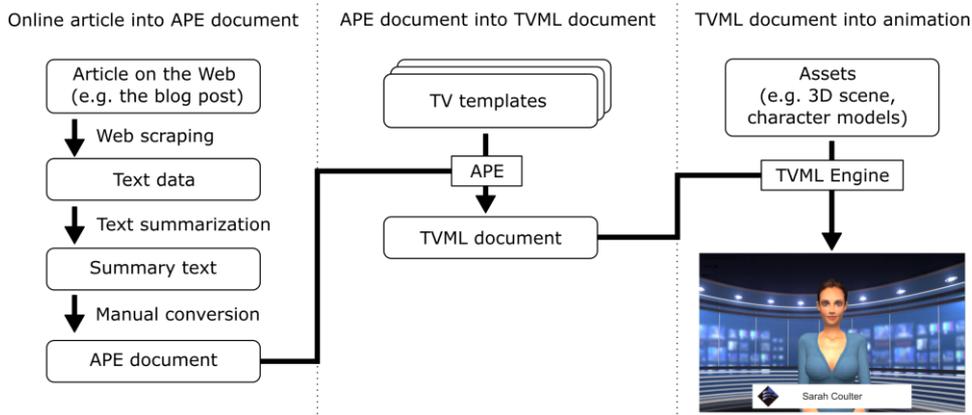


Fig. 1. Overview

word in a document. By using this model, our system can output summarized texts of the blog.

### B. Summnerized text into intermediate file

Summnerized text is converted into intermediate file what we call APE (Automatic Production Engine) document. APE document is an xml-based file which has tags defined by APE and TV template. This process is done manually because we have to handle multimedia data in the blog post. Multimedia data appears along the storyline of the article. However, the sentence referring to a multimedia data may be lost as the result of summarization. The relationship between summarized text and multimedia data is not clear. We have to manage multimedia contents to use and its timing manually.

### C. Converting APE into TVML

APE document is converted into TVML document using one of TV templates. TV template is a set of rules for tag replacement. Each tag in APE document is replaced by a set of TVML commands. Figure 2 shows an example of tag replacement. The `<talk>` tag turns into three TVML commands described in the TV template. The content of `<talk>` tag is copied at the “\$\$” symbols.

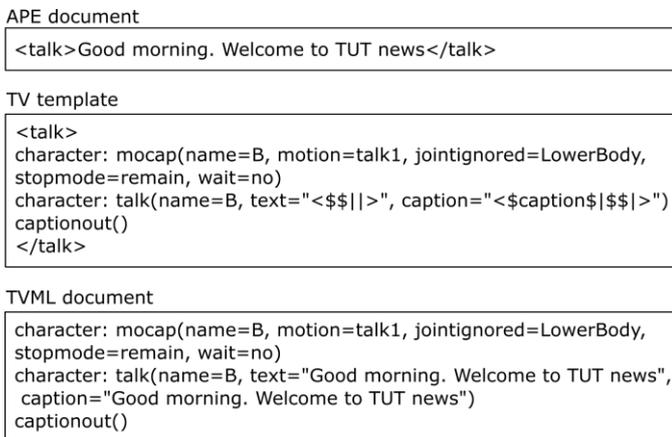


Fig. 2. Tag replacement using TV template

## IV. RESULTS AND DISCUSSION

We implemented our method using a Unity version of TVML SDK. The advantage of using a template is to keep an intermediate file simple. We can generate an animation without complicated commands of TVML and can obtain a different expression by changing the template to use. On the other hand, a template is a few rules extracted from the TV show. To control the detail expressions, for example, conditionally changing the character’s behavior is hard with our template approach.

The conversion process of online article into APE document is currently semi-automatic. To keep the relationship between the original text and multimedia contents during the summarization is required to complete fully automatic conversion. Document summarization techniques including images [7] may be useful to achieve this.

We have not evaluated the resultant animation using text summarization. The evaluation of summarization is a difficult task in the field of natural language processing. In our case, we evaluate the summarized text as the character’s speech. Investigation of the better summary as the speech text is an interesting challenge.

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