Retrieval by Sensory Information

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Abstract

Until now, information retrieval has been conducted by language. In recent years, information retrieval using smart microphones has also developed. However, voice-based retrieval is conducted by converting voice into linguistic information. In this study, we propose a search based not on linguistic information but on language sensitivity information. Language sensitivity information is a way of saying things. We perceive differences in the way we say the same word. In other words, the difference in how we say a word is the sensory information of the language. This study proposes a method for extracting and retrieving sensitive information from language.

Keywords: Sensitivity, Kansei, Tactile Score, Information retrieval

1. Introduction

Sensitivity differs from person to person. The same greeting of "Good morning" may be perceived as cheerful by some and noisy by others. There is no correct answer to sensitivity, nor can it be generalized.

We can generalize if we take the average of many people's sensitivities. Sensitivities that deviate from the average should not be ignored or directed toward sensitivities closer to the average.

A general sensitivity search system is a system in which evaluation criteria for content are modelled for each individual through instructional learning, and each user's evaluation criteria model is used for searching.

The following algorithms have been used in a sensory search; color histogram A method to extract features of images and videos; impression analysis using the SD method A method to quantify the impression received from contents by assigning degrees to impression words, learning correspondence between impression words and contents, extracting correlation coefficients between contents, and

Extracting correlation coefficients, the distance between contents Projecting the quantified impression words and features of contents onto the feature space and measuring the distance between them.

2. Tactile Score

Why do we feel "cheer" from the children's "Good morning"? What is the difference between them? The difference is "the way you say it. How we say it can be characterized by the pitch and volume of our voice, but let us look at the volume of our voice.

When we think back to the children's "Good Morning," their voices gradually became louder and louder. So, let us describe the change in "loudness" by using the music notation. In musical notation, the higher the note is, the lower the note is, and the higher the note is, the lower the note is. The middle line (the third line) is the "normal" volume, and the lower the volume, the higher the volume,

and the higher the volume, the lower the volume. The "rhythm of speech" is represented by the notes as they are. We call this notation to describe tactile sense as the Tactile Score [1] (Fig.1).
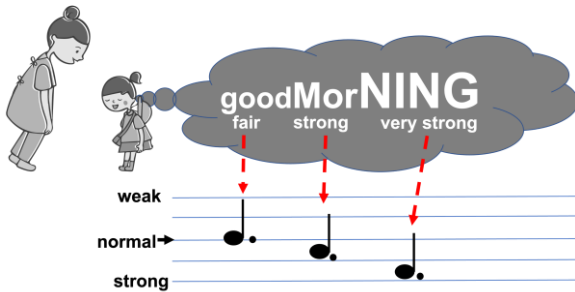

Fig. 1 Tactile Score

Fig. 2 Hardness, read from Tactile Score

Fig. 3 Roughness, read from Tactile Score

2.1. *Tactile Quality*

There are several essential factors in the sense of touch, the most crucial being "hardness" and the second most important being "roughness. These properties are called "tactile qualities. Is it possible to describe these tactile qualities in tactile notation?

Think of two kinds of "springs": a stiff spring and a soft spring. The softer spring will expand and contract more when these springs are pushed and pulled with the same force (difference in elastic force). Therefore, we call a tactile spring with a slight change in size "hard" and a tactile spring with a significant change in size "soft". If we consider this as a way of saying "good morning," "hard" is a way of saying "no intonation," and "soft" is a way of saying "full of intonation.

Now we can describe the most critical tactile quality, "hardness," in tactile notation (Fig.2). What remains is roughness. Roughness is described as "smooth" when there is little change in hardness and "rough" when there is a significant change in hardness (Fig.3). If we are walking on the grass in a park and the hardness of the grass is constant, we will feel "smooth".

3. Tactile tag

Any object with spatiotemporal variation can be converted into a tactile score. Hardness and roughness can be used as tactile tags.

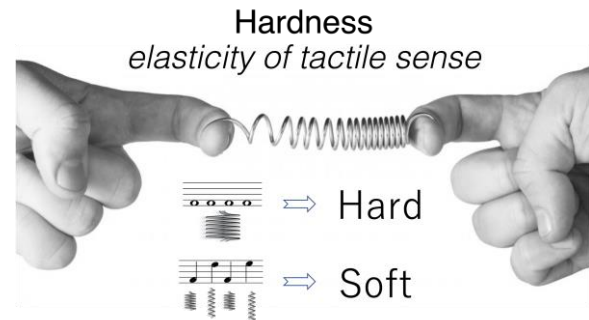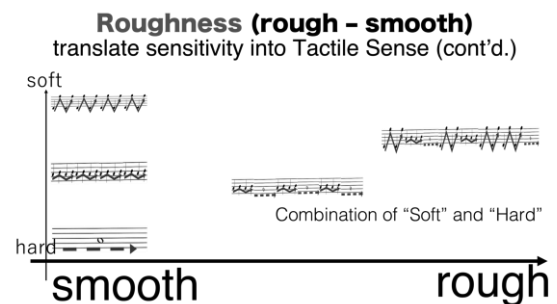By using tactile qualities, various objects can be tagged with tactile tags. For example, the tactile quality of a piece of music can be used to attach a tactile tag to the music. We created a music database for our experiments. The music used was music that was past its copyright protection period.

The data structure was a standard music database with the addition of the average Hardness and the average roughness values; the data structure is the usual music database, add the average Hardness and the average roughness;

<music name, information about the music (performer and so on), average hardness, average roughness>.

4. Tactile Query

Music can be retrieved by touching the audio or force-sensitive touch panel. Convert the time variation of vertical force to voice or force-sensitive touch panel into a tactile tag. The converted tactile tags can be used to search the database. In this search method, the search is

not performed by the name of the music piece. The search is performed by way of saying or touching (Fig.4).

Fig. 4 Tactile Query and result of retrieval; (Top) The map of Tactile quality, "20181122-1152" is the tactile quality of inputted voice and others are references.(Below) Japanese language in the middle, inputted language by voice ("it is a fine day and very good morning) and the system plays a music whose tactile quality is similar to the inputted voice

References

1. Y. Suzuki, R. Suzuki, Tactile score: a knowledge media for tactile sense. Springer Japan, 2014.

Authors Introduction

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