Challenge

Series: The Challenge of "AdapTV"
The Concept of "AdapTV"

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The environment surrounding television is drastically changing; multichannel television broadcasters are switching over digital broadcasting, the Internet and DVD recorders have risen to become new media, and more and more people are watching TV by themselves as many households have two or more TV sets. Accompanying his transformation in technology and viewing habits, the interests, preferences, and needs of our viewers are diversifying.

In an effort to respond to these changes, we began our research on AdapTV, a broadcasting service that adapts to the viewing environment. The idea behind AdapTV is to provide ubiquitous, universal broadcasting services that can tailor a single piece of content to the various needs and viewing circumstances of our viewers, and by this, we don't simply mean provision of different kinds of programs. We expect that the capability of converting one piece of content adaptively at a receiver to fit the various needs and circumstances of our viewers will dramatically improve the satisfaction that they get from viewing a television broadcast.

A conceptual image of the "AdapTV" service is illustrated in the figure below. This system attaches program-related information as metadata to the broadcasting program content. The metadata is extensive. It includes the meaning and purpose of each scene, the difficulty level of the content, the relationship between scenes, and location data for the people and objects in the image. The receiver maintains information related to the users, such as the viewer's knowledge level, interests, and preferences, the size/resolution of the viewing screen, and the viewing location. This information is stored as a profile (a viewer/circumstance profile). When the content arrives at the receiver, it goes through an "intelligent conversion" that refers to this profile and the metadata. What is important about this "intelligent conversion" is "AdapTV's" brain or knowledge base, which describes its conversion rules.

The conversion rules make it feasible to present content adapted to the specific viewing circumstances. The conversion process may involve simple content signal conversion or a much more complicated process that takes into consideration the program's content. It ensures that a video presentation has the optimum field angle for the terminal's size and resolution. It might even involve converting visual data into speech data, say, for drivers in motor vehicles, conversion of Japanese into a foreign language, replacement of harder words with easier words for children, recasting of an educational program to fit a viewer's learning level, or a condensed presentation to fit within a specified time.

The succeeding articles of this series on AdapTV will introduce specific examples of these applications. We hope that you will read to the next issue.
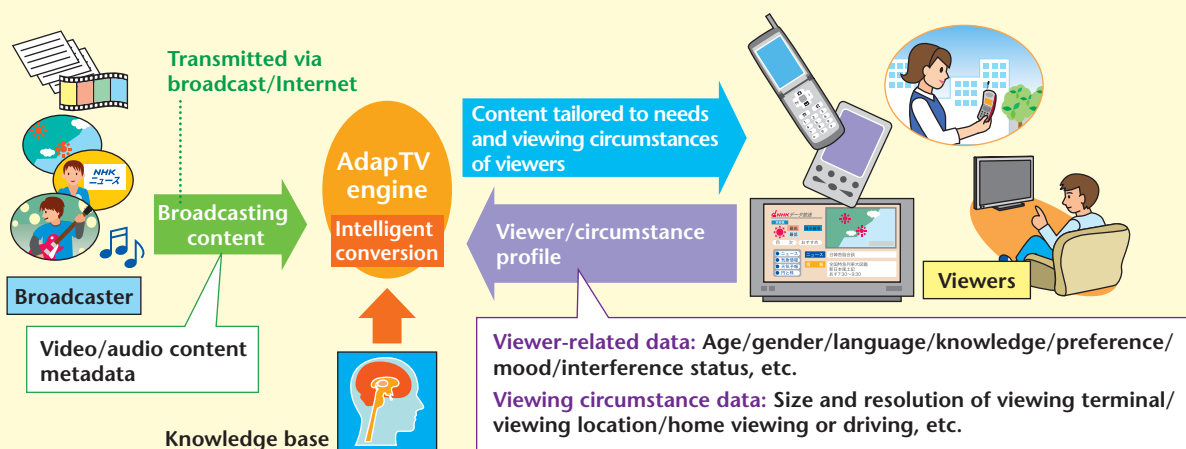
AdapTV conceptual image

Re-configuring Programs to Suit the Viewer's Learning Level

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If TV can provide language learning programs based on the viewer's individual learning level, viewers would be able to improve their language skills more efficiently. The system that can offer such a language learning program is "AdapTV." This future TV system will automatically determine the user's learning level and provide a language learning program tailored to him or her.

Advanced content to realize custom-made language learning program

To provide a language program with this customization function, a broadcaster should prepare content that includes information related to the difficulty of scenes featuring conversations in other languages and/or grammatical explanations (metadata). This content then becomes the material for the custom-made program.

Learning level estimated through remote control device operation

AdapTV will also estimate the learning level of the user. We are examining an automatic learning level determination system that utilizes a common remote control device. For example, if a certain scene is fast-forwarded, the skipped scene can be considered to be unnecessary; in other words, it is too easy for the user. On the other hand, if a scene is "rewound for replay" or "paused," it may be a difficult learning segment for the user. Based on this concept, a determination of the difficulty of individual scenes, easy or difficult, will be used to estimate the user's learning level. The "brain" of AdapTV accumulates this information and uses it as the user's learning level (profile).

Providing custom made language learning programs

AdapTV employs metadata and accumulated profile data to re-configure content to suit the user's learning level. The intended program is a language program tailored to a particular user, for which the TV generates a customized program script, including for example, an easy segment that could be automatically "skipped" and difficult segment to be automatically "repeated". An individualized language program perfectly adapted to each of us will allow us to enjoy learning a new language, by efficiently enhancing our command of that language. Such a dream is being made possible at STRL.

Content

Program re-configuration

Custom-made program

Broadcasting station

Metadata profile

Storing remote control device operation log

Profile

Simple scene →Fast-forward ▶▶

Difficult scene →Repeated replay

Pause ❙❙