

TRIBA: A Cable Television Retrieval & Awareness System

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ABSTRACT

This paper discusses the design of a physical and digital system intended to allow for easy manipulation and interaction with the tremendous amount of options present in advanced multimedia devices, such as digital cable television. As user demand for access to large quantities of data increases, and cable companies offer more choices to their audiences, traditional content selection techniques become less useful and much more difficult to understand.

TRIBA is the result of a ten week research and design exploration investigating how users can easily manipulate and comprehend tremendously large data sets. The findings of this research indicate a need for utilizing interactive agents to bridge the gap between the user and their goal. As technology is created and consumer electronics becomes more integrated into our lives, devices speak a language that users are expected to learn. TRIBA is a product embracing the philosophical idea that users should not have to learn a new language to interact with a futuristic and useful product, but instead products and devices must learn to speak the same language as the user.

Author Keywords

Information Visualization, Convergent Product Design, Context+Focus, User Agents

ACM Classification Keywords

H5.2 Natural Language

INTRODUCTION

Current cable television systems boast hundreds of channels, yet few of these channels are ever utilized by subscribers [1]. It is hypothesized that a great deal of these channels go unused because of lack of accessibility; the current “up, down, or direct number manipulation” of channels may not be the most effective way to get users to the content. Contextual research was conducted with users

as they interacted with existing television control systems, such as TiVo, and comparable studies were conducted in domains that require the selection of one data point from a much larger set (such as MP3 organization and shopping in a store for a greeting card). Through this research, two primary and naturally occurring interactions were identified: *Search and Retrieval* and *Awareness and Confirmation*.

Search and Retrieval, Awareness and Confirmation

Users experiencing *Search and Retrieval* know what they are looking for and thus it becomes the job of the interaction device to retrieve the content as quickly and seamlessly as possible. Users who experience the contrary *Awareness and Confirmation* have an imprecise idea of what they are looking for; with the help of a third party, they become aware of their options. Consequently, they proceed to confirm their options and decide on a final choice. Both situations share the commonality of a gap between the user and the content that they seek.

In a multi-channel television content system, the generally accepted convention is the use of a remote control and an onscreen interface to guide users through content. This system is successful when used with a small quantity of data points (channels). Users are prone to repeatedly press the “channel up” or “channel down” button to gain an understanding of all of their options one data point at a time. Contextual research illustrated that, when this system is used with data structures of more than approximately one hundred channels, users no longer can comprehend all of the data. Users directly select the specific channels they frequent using numerical selection, and thus ignore the remaining channels completely.

Thus, an opportunity is identified: seamless interaction of a large data set will allow users to explore with ease, and will cause the user to explore more often. Thus, the direction for this design was restated as including the naturally occurring interactions (*Search + Retrieval* and *Awareness + Confirmation*), the properties of *Search Protocols*, and a seamless user perception.

A RETRIEVAL AND AWARENESS SYSTEM

TRIBA, a prototypical television control unit made up of a physical device and a software counterpart, allows users to interact with the interface in a fluid, humanistic manner. By

speaking to the physical agent, users can specify the parameters for the content they wish to view.



Figure 1. Triba, the agent that bridges the gap between user and digital interface.

Commands are spoken in an everyday manner mimicking conversation between a user who wishes to find something and one who may have key information on the user's goal. For example, the user may say, "I want to watch something with action." TRIBA parses the information into manageable chunks, such as "I", "Want", "Watch" and "Action". With this information, the agent then brings up all channels with containing action, using existing DTV content identification. Users may also interact with TRIBA by rotating the device, or "showing" images to TRIBA. All three interactions are purposely designed to mimic real world occurrences between users.

The TRIBA software interface, as shown in Figure 2, arranges all of the channels in a spherical composition, allowing users to comprehend the entirety of the television entity. This sphere provides a 1:1 relationship with the physical control, creating a clear connection between the physical and the digital interfaces.

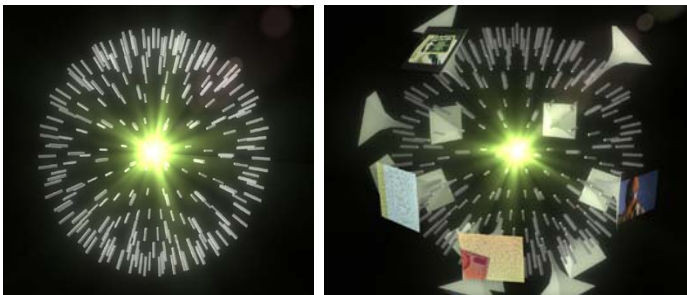


Figure 2. TRIBA's interface, first with no channels active and then with fifteen channels active

Each channel is represented on the screen as a single dash that has the ability to expand and display content. This design, heavily influenced by both the hyperbolic browser as well as context+focus visualization theories [2], allows users to see all of their options while still focusing on a group of data points.

Once the user uses TRIBA to select parameters, the appropriate channels expand and begin to play streams of their content. In this design the user can specify as many parameters as they wish and the visualization will adapt depending on the amount of pertinent content available. If a user is too general, a large number of channels will expand which encourages the user to be more specific.

DISCUSSION

Usability testing of TRIBA identified some very interesting human responses. Generally, users had little trouble understanding the visual interface of TRIBA; instead, as shown in Figure 4, users had the most trouble learning to speak to the physical device in a natural manner.



Figure 4. A user interacting with Triba.

One user made the comment, "You mean it's that easy?", as if they expected a useful device to be much more difficult to operate. Users connected with the "cute" appearance of the design, creating a bond of companionship, and caused them to take care in handling the device. This indicates an interesting cultural "training" that may have occurred: users seem to have come to expect new and useful electronic devices to be difficult to use and fragile, rather than easy and durable. Devices built with this sort of agent-based infrastructure will need to create a dynamic, trusting relationship with end users to be successful [4].

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