

Físchlár on a PDA: A Handheld User Interface to a Video Indexing, Browsing and Playback System

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1. FÍSCHLÁR SYSTEM

Físchlár is a web-based system for recording, analysing, indexing, browsing and playback of broadcast TV programs, in digital format [Lee 00a]. It allows a user to initiate the recording of TV programmes from one of 8 major TV channels in Ireland and that programme, when broadcast, is recorded in MPEG-1 format. This is then subjected to analysis to determine shot and scene bounds and to select representative frames, and these are then used in a browsing interface, allowing a user to navigate through, as well as among, recorded programmes. Currently about 500 programmes have been recorded, archived and are available for browsing and playback, corresponding to about 300 hours of video content. A conventional web browser is used for browsing and playback of video contents, with multiple distinctive browsing interfaces provided as options and playback capable of simultaneous streaming to almost 150 client users. From this system different applications are being developed, including Físchlár-PTV, a personalised recommender system which uses case based reasoning and a population of users to recommend TV programmes which users are likely to want to watch [Smyth 00]. Although Físchlár has been originally developed as a desktop application with a web browser and a mouse, we are also working on SMS and WAP applications for TV programme notification, alerting, recording request, etc.

2. USER INTERFACE FRAMEWORK

To be able to design and provide many alternative browsing interfaces to users, we have developed an interface design framework for keyframe browsing (full details can be found in [Lee 00b]) which we later use to design interfaces for handheld devices. In summary, by analysing the essential elements of keyframe browsing interfaces, we came up with three "dimensions" and possible "values" for each dimension:

- (1) Layeredness - consideration about different details or granularity of the browsable keyframe space. Design options (or values) for this dimension are Single layer, Multiple layer with/without navigational link, etc.
- (2) Temporal orientation - what kind of time information to be provided on the interface. Values for this dimension are Absolute time (e.g. timestamp in each keyframe), Relative time (e.g. timeline bar), etc.
- (3) Spatial vs. temporal presentation - whether to present miniaturised keyframes spatially or one by one temporally on the screen. Values are either Spatial or Temporal.

From this framework, "designing a browsing interface" is to simply selecting a possible value from each of the dimensions. For example, selecting Single layer / Relative time / Spatial presentation makes one distinctive browsing interface. This method allows us to come up with many alternative keyframe browsing interfaces for the same underlying system.

3. PDA INTERFACES FOR VIDEO BROWSING

Of all design possibilities coming from the framework, suitable ones have to be chosen by considering the particular environment of the system in concern - the kind of machine used, the users and their task. In this abstract we focused on the browsing interface for Psion's PDA (Personal Digital Assistant) called Revo. Revo is designed for a mobile environment, with a small touch-sensitive, landscape-oriented screen (480x160 pixels resolution) and 16 shades of gray.

From our framework, we considered all possible combinations of dimensions, and came up with some selections that we considered suitable for Revo. One of them (Figure 1) shows a list of



Figure 1. Single layer / Relative time / Temporal

available TV programmes from which the user can select one for browsing. On the left side the keyframes of the selected programme is displayed, with the timeline bar at the bottom providing temporal orientation. Tapping on a segment on the timeline bar changes the keyframe that represents that point in the video, and also the left/right arrow buttons can be tapped to see the previous/next keyframe. Another design (Figure 2) provides multiple layers - the user can select the amount of keyframes to browse, by moving up and down the layers with two arrow buttons on the right. In each layer the user can view the previous/next keyframes by tapping the two arrow buttons on the left. Keyframes are displayed in the centre of the screen and all the buttons on the sides. The user can grab the Revo firmly with both hands and use both thumbs to control layers and keyframe flipping, in a highly interactive way. In designing an interface, our approach is to be aware of all design possibilities, and then select the more usable ones among them that suit the particular circumstance of the device. We have just finished implementing and testing these interfaces and we hope to start usability testing with a small number of users soon, to identify usability problems and refine interfaces accordingly.



Figure 2. Multiple layer with link / Absolute & Relative time / Temporal

REFERENCES

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