Pronto video: An Image Sequence Segmentation Tool Applied to Video Edition

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Abstract. This work proposes an image sequence segmentation tool for video masking. It consist of a semi-automatic delineation tool of the object of interest, its segmentation, through the video sequence. The tool is based on watershed by markers technique, where the markers are propagated from frame to frame using normalized correlation pattern matching algorithm.

1 Pronto video

Among the techniques applied to digital video edition are the video masking ones. These techniques consist in the substitution of objects in a video sequence by cutting and pasting them in another sequence.

Prontovideo is an image sequence segmentation tool to be proceed to do video masking. It can be used to segment objects in a sequence by interactively placing markers in the first frame and by subsequent propagation of these markers to the following frames. These markers are important since they are used in the segmentation technique applied to each frame (watershed operator [2]). The propagation is also important since, once the markers were assigned the objects, they must track them in the sequence, through application of template matching techniques [1], in order to segment the objects in the subsequent frames.

The main advantages of this tool are: i) the instantaneous response to the marker placement; ii) general method applied to any kind of video sequence; iii) and the progressive manual editing. Once you segment manually the first frame by interactively selecting the placement of the markers, you can propagate the markers to next frame, check the quality of the segmentation, making corrections when necessary by deleting and inserting new markers. This process repeats until the last frame.

2 Implementation

Prontovideo was implemented in Tcl/Tk, a scripting language with a fast construction of graphical user interface. It were implemented functions to open/save sequences, to play them and to segment the objects, statically and through the sequence. It is available for MS-Windows, Linux and Solaris platforms.

Figure 1: Prontovideo

The morphological operators, the watershed segmentation technique [2], the marker propagation techniques and other image handling functions were written in C. It were used the ADESSO, an authoring system for designing computer vision and digital image processing applications, to create automatic wrappers from Tcl/Tk to the C library.

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References
