Novel, computer-assisted method for colorization

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A novel, computer-assisted method for colorizing black and white images and movies has been developed by researchers at the Hebrew University of Jerusalem's Benin School of Computer Science and Engineering.
The method is less expensive and time-consuming than earlier colorization methods developed in the late 20th century and which were used to convert to color several classic black-and-white motion pictures such as "Casablanca."

Image: Marked B/W image

A major difficulty with colorization has been its labor-intensiveness. For example, in order to colorize a still image an artist typically begins by

dividing the image into regions, and then proceeds to assign a color to each region. Unfortunately, there is no fully automatic way to reliably perform this task, since automatic algorithms often fail to correctly identify fuzzy or complex region boundaries, such as the boundary between a subject's hair and face. Thus, the artist is often left with the task of manually delineating complicated boundaries between regions.

Colorization of movies requires, in addition, tracking regions, as movement occurs across the frames of a particular scene. Again, there have been no fully automatic and reliable region-tracking algorithms for accomplishing this.

Result

Now, Dr. Dani Lischinski, Dr. Yair Weiss and graduate student Anat Levin from the Hebrew University's Benin School of Engineering and Computer Science have developed a new, interactive, colorization process that requires neither precise, manual, region detection, nor accurate tracking.

The user indicates how each region should be colorized by simply

"scribbling" the desired color in the interior of the targeted region, as viewed on a computer screen, instead of tracing its precise boundary.

With these user-supplied "hints," the software developed by the researchers automatically propagates colors to the remainder of the image and from there to subsequent frames of the movie.

This new technique offers a simple, yet surprisingly effective interactive colorization tool that drastically reduces the amount of input required from the user. In addition to colorization of black-and-white images and movies, the technique is also applicable to selective recoloring, an extremely useful tool for refining digital photographs and for achieving special effects. A provisional patent application has been filed for the process.

The new technology was recently presented at the world's leading conference on computer graphics, held in Los Angeles, where it generated great interest.

Source: Hebrew University of Jerusalem

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