15 Seconds of Fame — An Interactive, Computer-Vision Based Art Installation

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ABSTRACT

"15 seconds of fame" is an interactive installation which every 15 seconds generates a new pop-art portrait of a randomly selected person from the audience. The installation was inspired by Andy Warhol's ironical statement that "In the future everybody will be famous for 15 minutes". The installation detects human faces in digital images of people who are standing in front of the installation. Pop-art portraits are then generated from randomly chosen faces in the audience by applying randomly selected filters. These portraits are shown in 15 second intervals on the flat-panel computer monitor which is framed as a painting. Electronic copies of each displayed portrait can be ordered by e-mail.

Categories and Subject Descriptors

J.5 [**Arts and Humanities**]: Fine Arts

General Terms

Experimentation, Human Factors

Keywords

computer vision application, face detection, color filters

1. INTRODUCTION

The Computer Vision Laboratory and the Video and New Media Department of the Academy of Fine Arts, both at the University of Ljubljana, have collaborated in bringing together modern arts and information technologies since 1995 [1, 4]. The installation "15 seconds of fame" is one of the results of this intermingling [7]. The objects on images being analyzed by computer vision are in increasing degree people and their activities [2]. A core task in this people centered computer vision objective is face detection which with succeeding face recognition is an increasingly important goal in video surveillance which is in turn becoming a major focus of cultural production [5]. A video camera in combination with various types of displays has been used over and over in different art installations, often as some sort of electronic mirror (i.e. *Touch Me* by A. d'Urbano and *Liquid Views* by M. Fleishman et al.).

2. MOTIVATION

The installation "15 seconds of fame" was inspired by Andy Warhol's celebrated statement that "In the future everybody will be famous for 15 minutes" [8] and his photography derived paintings of famous people. Warhol took faces from mass media, banal in their newspaper everydayness, and transformed them into portraits. Warhol portrayed in this fashion celebrities from arts and politics [3]. The installation described in this paper tries to make instant celebrities by reversing Warhol's process—making Warhol-like celebrity portraits of common people and putting them on the gallery walls to make the portraitees implicitly famous. Since 15 minutes would hardly make the installation interactive the fame interval was shortened to 15 seconds. The faces for the portraits made by the installation are selected by chance out of all people in front of the installation to allude that fame tends to be not only short-lived but also random. In his film and video projects Andy Warhol was in fact fascinated with celebrification of "nobodies" which marks the beginning of an era in which media attention became the new mirror of the individual's self-perception [5].

3. HOW THE INSTALLATION WORKS

The visible part of the "15 seconds of fame" installation consists of a computer monitor framed like a painting. A digital camera is hidden behind the frame so that only a round opening for the lens is visible. Pictures of gallery visitors which are standing in front of the installation are taken every 15 seconds by the digital camera using a wide-angle lens setting (Fig. 1). The camera is connected to a computer which detects all faces in each picture, randomly selects a single face, makes a pop-art portrait out of it and displays it for 15 seconds on the monitor. All programming has been done by the authors.

3.1 Automatic face detection

Each digital photo is analyzed by the computer to detect faces in it. Automatic face detection is like most other automatic object detection methods difficult, especially if

Figure 1: People in front of the installation.

sample variations are significant. We decided to use a color-based approach for face detection [6]. First, all pixels that do not correspond to skin color are eliminated. Next, the system applies a region growth algorithm, which segments all face-like pixels into candidate face regions. Each candidate face region must pass some simple heuristic tests such as width/height ratio and percentage of skin-like pixels to qualify as a true face region. Since in each image just a single face is required, the algorithm is designed to have a lower percentage of true positive face detections in favor of a very low percentage of false positive detections. Still, sometimes someone's arm or palm becomes "famous" and faces of very dark complexion are also not detected, however, faces seen from the profile are detected.

The color-based nature of our face detection makes it sensitive to illumination. Since it is not always possible to exhibit the installation under daylight or white-balanced studio illumination, we improved our face detection results by applying color compensation methods to make the whole system more flexible [6].

3.2 Face selection

The next step in generating a "15-second" portrait is to randomly select one face among all detected faces and to crop it from the original resolution image. Since gallery visitors often stay in front of the installation for several 15-second intervals, we integrated a rule that tries to prevent the selection of the person at approximately the same location in two subsequent 15 second intervals. If no face is detected then the last selected face is subjected to new color transformations.

3.3 Pop-art color transformations

To make his celebrity portraits Warhol segmented the face from the background, delineated the contours, highlighted some facial features, started the process with the negative, overlayed the image with geometric color screens etc. [3]. We tried to achieve similar effects with a set of filters that achieve effects similar to segmentation. The filters drastically reduce the number of different colors by joining similar looking pixels into uniform regions. They combine three well known filters: posterize, color balance and hue-saturation with an additional process of random coloring. Random

coloring selects a color from the color palette of the already filtered image and replaces it with a randomly selected new color. In this way, we achieve millions of different effects.

3.4 Display of portraits

The portraits are displayed in two configurations: in 75% of cases just a single portrait is shown, in 25% of cases four smaller version of the same portrait are shown as a tribute to Andy Warhol's way of displaying images.

In the lower left corner of the display a counter displays the seconds ticking from 15 to 0, reminding the currently "famous" visitor that his fame is fading away. When a portrait is being displayed, the processing of the next portrait is taking place, so that after 15 seconds another one can be displayed.

A unique ID number is displayed along each portrait and if this ID is e-mailed to our server, the system e-mails the requested portrait as an attachment back to the sender. In addition, a temporary web page is generated showing the requested portrait whose colors can be changed.

4. CONCLUSIONS

The motivation and realization of an interactive installation based on computer vision technology is described. Our primary goal was not to mimic Andy Warhol's pop-art portraits per se, but to play upon the celebrification process and the discourse taking place in front of the installation [7]. In comparison to other video camera based art installations, ours does not require exact positioning of observers due to automatic face detection with the additional benefit that a group of people can interact with the installation simultaneously. The interaction is technically very simple—no visible interface is actually involved—but unpredictable and socially revealing.

5. REFERENCES

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