EasyToon: Cartoon Personalization Using Face Photos

Fang Wen
Microsoft Research Asia
fangwen@microsoft.com

Shifeng Chen
Chinese University of HK
sfchen5@ie.cuhk.edu.hk

Xiaoou Tang
Chinese University of HK
xtang@ie.cuhk.edu.hk

ABSTRACT

In this demo, we present a family photo album based cartoon personalization system, EasyToon. Using the family photo album as the candidate pool, a personalized cartoon image is obtained in two main steps. First, the best face candidate is selected from the album interactively. Then a personalized cartoon image is automatically synthesized by blending the selected face into the target cartoon image. By integrating state of the art computer vision and graphics technologies and effective UI design EasyToon can generate a personalized cartoon storyboard easily and quickly.

Categories and Subject Descriptors

I.4.9 [**Image Processing and Computer Vision**]: Applications

General Terms

Algorithms, Experimentation

Keywords

Cartoon Personalization, Family Photo Album

1. INTRODUCTION

People love to personalize their identity in the digital world. Recently, a number of websites [1, 2, 3] start to provide services to help users make personalized cartoon works by choosing different templates and inserting personalized text. However, people can hardly say that the final products belong to themselves, because other users may select the same templates. In fact, a good way of personalization is to get people themselves involved into the final products. The most identifiable personal feature is of course the face of the person. Thus inserting face into the cartoon picture is clearly the most effective and satisfying way of cartoon personalization. Fortunately, with the rapid popularization of digital cameras and mobile phone cameras, digital family photo albums grow explosively. These family photo albums provide a huge pool of face photos that can be used for cartoon personalization.

Motivated by these observations, our scheme for cartoon personalization is to extract a suitable face from the photo album and insert the real face into the cartoon pictures. However, it is a challenging task even for a professional

artist. First, a suitable photo should be selected carefully from thousands of images in the album. Then, the face should be cut out of the photo carefully. Before seamlessly compositing the target cartoon image, the size, rotation, and colors of the face should be adjusted. Each step of this process is time consuming and the user is required to be familiar with some image editing tools such as Adobe Photoshop.

EasyToon is designed simulating the artist's action to generate the personalized cartoon in a fast and interactive manner. By integrating state of the art computer vision and graphics technologies, such as face detection, face alignment, Poisson image editing and color transfer, as well as effective UI design, EasyToon can be used to quickly generate the personalized cartoon pictures even for users without any image processing or art background.

2. EASYTOON SYSTEM DESCRIPTION

EasyToon is designed to work in a semi-automatic interactive way. The framework of EasyToon is shown in Fig. 1.

Before starting the cartoon synthesis, we use EasyAlbum [5] to manage the photo album in the pre-processing stage. In the photo indexing stage of EasyAlbum, faces in the album were detected [6] and 87 landmarks of each face were aligned [7] and recorded automatically. Then, effective face tagging functionality of EasyAlbum is used to annotate the name of each face easily.

2.1 Cartoon Personalization Algorithm

Simulating human actions in cartoon personalization, Easy-Toon contains two key components:

2.1.1 Interactive Face Selection.

Since there are thousands of photos in the album, it is time consuming to select a face by browsing all the photos. An interactive approach is designed in this system for face selection. Four key ideas are included in the face searching process.

1. Using face detection information, photos without face can be filtered out to avoid browsing all photos in the album.

2. A landmark based facial pose estimation algorithm is used to help select candidate faces with poses best matching the cartoon face pose. The user can tune the "pose bar" in the UI to quickly get good face candidate via the preferred face orientation.

3. The brightness and resolution of faces are estimated to filter out bad face candidates.
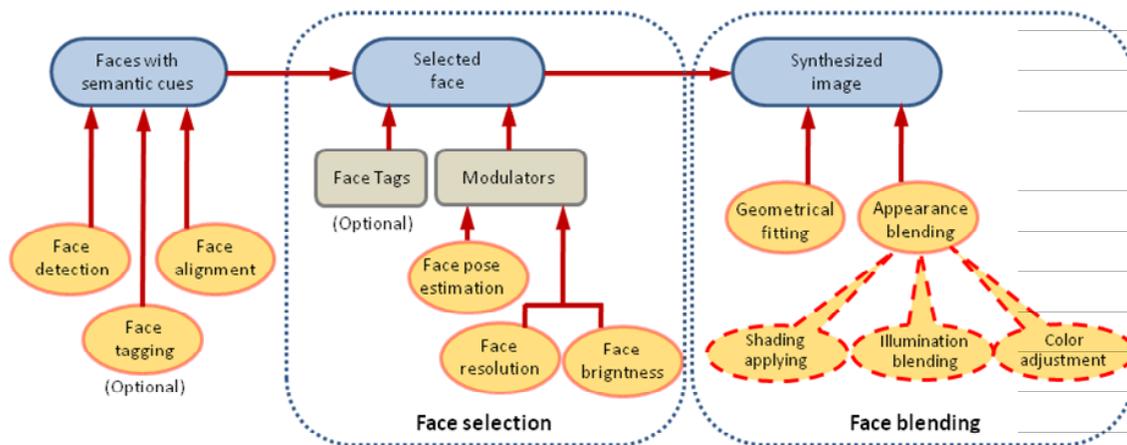
Figure 1: The framework of EasyToon.

4. Making use of tagged people name in the family photo album, the user can easily concentrate on faces of a specific person.

2.1.2 Face Blending.

Given the selected face, the system will automatically blend it into the cartoon template. In this face blending step, the geometrical fitting and appearance blending process are performed to deal with cartoon synthesis in the aspect of geometry (position and shape) and appearance (shading, illumination, and color), respectively. This step is fully automatic.

Detailed algorithms for each step are described in [4].

2.2 User Interface
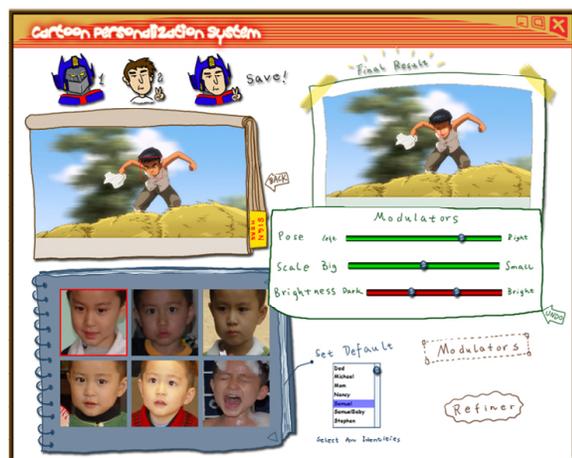
Figure 2: The UI of EasyToon.

The UI of EasyToon is shown in Fig. 2. It is quite easy for users to use EasyToon. After family album importation, the user first picks a cartoon in the cartoon window (left-top) and picks a face in the cartoon. EasyToon will show all faces of the photo album in the face candidate window (left-bottom). The user can optionally select the name in the right of the face candidate window to concentrate on faces of a specific person. If the user choose to select a name, the

face candidate window will only show faces of the selected person. By clicking the "modulators" button in the main frame, a window popped up. By tuning the "Pose" bar, all candidates are ranked based on the face orientation and by tuning the "Scale" and "Brightness" bars, overly dark/bright candidates or those with too small size can be eliminated. Once the user chooses a candidate face, a synthesized result will appear in the result window (right-top) in seconds. User can easily try different candidates quickly.

3. SUMMARY

In this demo, a family photo album based semi-automatic cartoon personalization system, EasyToon, is presented to generate personalized cartoon picture by replacing the cartoon face using a real face in the album.

To simulate the action of the professional artist, EasyToon is designed in two stages. First, an interactive approach is proposed to select a good face candidate from thousands of faces quickly. Second, an automatic face blending process is designed to paste the selected face on the cartoon image. This process releases the user from many boring tasks, e.g., face cutout, face transformation, color adjustment, and picture blending. And it allows the user to quickly try out different results.

With a friendly UI, EasyToon is simple and quick. A user without any art background can use this system easily in a short time and synthesize personalized cartoon quickly. Please visit http://mmlab.ie.cuhk.edu.hk/EasyToon for the demo.

4. REFERENCES

[1] http://www.whimsies-online.com/.
[2] http://www.oktoon.com/.
[3] http://www.cowboychuck.com/.
[4] S. Chen, Y. Tian, F. Wen, Y.-Q. Xu, and X. Tang. EasyToon: an Easy and Quick Tool to Personalize a Cartoon Storyboard Using Face Photos. In *ACM Multimedia*, 2008.
[5] J. Cui, F. Wen, R. Xiao, Y. Tian, and X. Tang. EasyAlbum: an interactive photo annotation system based on face clustering and re-ranking. In *SIGCHI*, 2007.
[6] R. Xiao, H. Zhu, H. Sun, and X. Tang. Dynamic cascades for face detection. In *ICCV*, 2007.
[7] Y. Zhou, L. Gu, and H. Zhang. Bayesian tangent shape model: estimating shape and pose parameters via Bayesian inference. In *CVPR*, 2003.