# Photograph augmentation based on a predefined theme

EE368 Project proposal, October 2015

Orly Liba, orlyliba@stanford.edu

Introduction

On October 2014, Google released a tool for augmenting photographs called "halloweenify". The tool modified uploaded photos and transformed them to convey a Halloween spirit by putting masks on people's faces or by turning them into zombies (Fig. 1). Not only the people were transformed, the complete photo was augmented with unique filters to set the mood of the photo and complete the Halloween experience. Unfortunately, Google has discontinued "halloweenify" soon after its release.
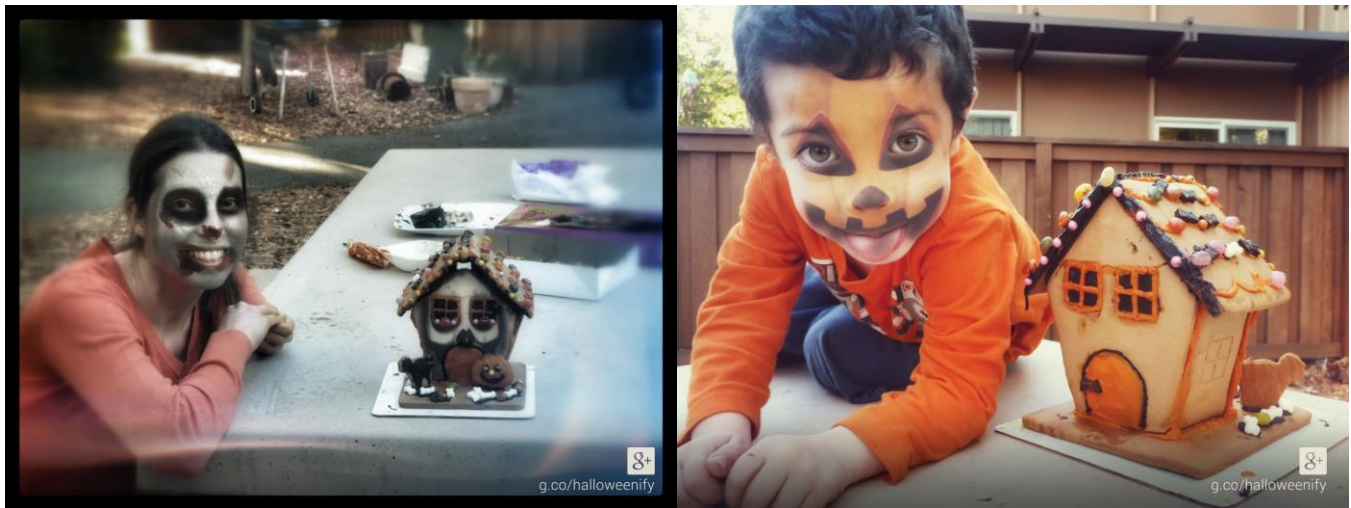
Figure 1 Two examples of Google's halloweenify. Two themes are shown, zombie (left) and pumpkin (right). The left photo shows a the house wrongly detected as a face.

Project description

I aim to recreate "halloweenify" and present it as a fun demo during the poster session. In addition to creating a Halloween experience, if time permits, I will create additional themes such as Christmas or Stanford. This includes facial modification of photographed people and application of color and blur filters to complete the experience of the augmented photograph.

Goals and implementation

The project will be implemented in Matlab and utilize openCV libraries. I aim to create three themes in total, which include a combination of a mask and a mood. Each photo will undergo the following steps:

1) Pre-processing
   a. Choose a mask and a theme
   b. Manually or automatically mark the facial features of the mask
   c. Create a radial blur filter
   d. Create color filters
2) Face augmentation
   a. Face detection (*1*)
   b. Facial feature detection (*2*)
   c. Warping of the chosen mask to fit the facial features (*3*)
   d. Applying the mask over the face with some transparency
3) Completing the experience
   a. According to the chosen theme, a color filter will be applied on the image
   b. Additional blurring and color will be added to the image, according to the chosen theme.

The full algorithm should run on a laptop computer for less than a minute or two in order to be demonstrated as a demo.

References

1. M. Abdel-Mottaleb, A. K. Jain, Face detection in color images. *IEEE Trans. Pattern Anal. Mach. Intell.* **24**, 696–706 (2002).

2. S.-H. Jeng, H. Y. M. Liao, C. C. Han, M. Y. Chern, Y. T. Liu, Facial feature detection using geometrical face model: An efficient approach. *Pattern Recognit.* **31**, 273–282 (1998).

3. T. Beier, S. Neely, Feature-based image metamorphosis. *ACM SIGGRAPH Comput. Graph.* **26**, 35–42 (1992).