Fingernail painter

Hao Yee, Chan (haoyeec@stanford.edu)
Nicholas, Yap (yjtn@stanford.edu)

Description

When purchasing nail polish, customers often need to assess how the color matches their skin tones under various lighting settings before coming to a purchase decision. Hence, the goal of this project is develop an application on the DROID camera phone, allow nail polish purchasers to visualize how a nail polish color would look on them. The user simply has to take a picture of the nail polish bottle and our application would overlay the color on their finger nail either on a static image of their hand or on a real-time video of their hand. The user will also have the option to change the "viewing environment" to see how the color would differ under different lighting conditions

Implementation

The application can be split into three major components
a) Detecting the hand and the fingernail portion via image segmentation
b) Detecting the color of the nail polish from an image of the bottle
c) Modifying the color of the nail polish and skin color (of hand) based on lighting conditions
d) Overlaying the nail polish color onto the fingernail and changing the skin color on the output image / video
For the purposes of this project, we will focus on static images first (i.e. the output will be the nail polish overlaid over an image of the hand taken under known lighting conditions). Techniques such as Viola and Jones method or minimum bounding circle (MBC) or binarization can be used to detect the hand. By image segmentation techniques, we can then identify the fingernail region. Image segmentation can also be done to identify the color of the nail polish. To simulate various lighting conditions, we can modify the pixel values by simple matrix operations.

References

[1] Kolsch, M.; Turk, M.; , "Fast 2D Hand Tracking with Flocks of Features and Multi-Cue Integration," *Computer Vision and Pattern Recognition Workshop, 2004. CVPRW '04. Conference on* , vol., no., pp. 158, 27-02 June 2004

[2] C.-C . Chang, J.-J. Chen, W.-K. Tai, and C.-C. Han;"New approach for static gesture recognition" Journal ofInformation Science and Engineering, 22(5):1047-1057,September 2006.

[3] Starner, T.; Weaver, J.; Pentland, A.; , "Real-time American sign language recognition using desk and wearable computer based video," *Pattern Analysis and Machine Intelligence, IEEE Transactions on* , vol.20, no.12, pp.1371-1375, Dec 1998