

Problem Statement and Goals

Hairesthetics

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Table 1: Revision History

Date	Developer(s)	Change
Sep 22	Charlotte, Marlon, Senni, Hongwei, Bill, Qiushi	Initial Draft

1 Problem Statement

1.1 Problem

A good hairstyle improves anyone's self-confidence and self-worth. However, making these kinds of decisions can be difficult and sometimes require a costly hairstyle expert. The average cost of a haircut in Canada is between \$60 and \$90. In addition, people often get disappointed and unsatisfied after trying new hairstyles. Hairstyle is an important feature of a person's image and an unsuitable haircut changes how people perceive you. Moreover, you will be stuck with the hairstyle for at least a few months since hair grows relatively slowly.

1.2 Inputs and Outputs

The project takes the inputs of the user's appearance and the user's choice of hairstyle and hair color, and then it should output the appearance of the user with the selected hairstyle and hair color.

1.3 Stakeholders

Anyone who wants to see how other hairstyles and different hair colors match their appearance virtually.

1.4 Environment

1.4.1 Hardware

A mobile phone with iOS system, camera, and internet connection.

1.4.2 Software

iOS system 15 and above.

2 Goals

2.1 Ease of Use

In terms of operations, the application should be intuitive to use and no further instruction is required. People of all age groups should be able to learn all of the features of the application with ease.

2.2 Real-time Facial Feature Detection

The system will be collecting user's facial features and outlines - eyes, nose, lips and others through camera, then import and analyze facial data information to locate user's face accurately on the screen. Further, different hairstyles could be matched on user's face and displayed properly.

2.3 3D Virtual Simulation

Virtual hairstyles are applied on user's head through camera in real-time. The user should be able to visualize through the phone screen as the simulation proceeds. The hairstyle simulation will be available in 3D structure which means the virtual hair should move around as the user's head moves.

2.4 Fast Response

The application should respond and provide outputs within less than 1 second after the user selects the hairstyle and hair color.

2.5 Safety of User Data

The application should secure user data. There should be no case of information leakage.

3 Stretch Goals

3.1 Accuracy of Detection

The detected face features should be precise and match the user's facial features in real life.

3.2 Quality of Virtual Simulation

The appearance of the virtual hair should look similar to the appearance of hair in real life.

3.3 Support virtual modification

The advanced version should allow the user to modify the virtual hair. For example, hair cuts, hair perms, hair straightening, and hair color, etc.

3.4 Hair style detection

Be able to identify the name of the hairstyle from an input image.

3.5 Provide nearby Barber Shop

The advanced version should allow the user to view the nearby Barbershops.