Hair Style Recommendation Method based on Automated Face Shape Detection

Marnie Boyer
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As consumers become increasingly demanding that technology solve their everyday problems, the $20B hair care industry has the opportunity to evolve and differentiate to meet the needs of today's high-tech, on-the-move women. Hair salons that appeal to these high-earning women must satisfy them by offering a differentiating level of service. With this project, I will attempt to address this challenge by developing a hairstyle recommendation system that identifies the user's face shape and recommends the most flattering hair style. My approach will be to first build a facial classifier that will determine whether the user's face is long, round, oval, heart- or square-shaped. Based on the classification, the model will recommend appealing hairstyles. This classification and recommendation system will help minimize human bias in hair style selection and increase the likelihood that the consumer will be matched with an ideal hair style and therefore more satisfied with her look.

This approach will require several techniques and tools from this course: python, visualization, exploratory data analysis, web scraping, feature engineering, featurization, classification models, supervised clustering, unsupervised clustering, artificial neural networks, and possibly TensorFlow and Keras.

The training images will be a collection of celebrity images whose faces have been classified by beauty websites such as cosmo.com, allure.com, redbook.com, marieclaire.com, beautyeditor.ca, stylecaster.com, instyle.com, etc. I will utilize web scraping to aggregate the celebrities' pictures and their classified facial shape. Utilizing dlib's face recognition package, each celebrity's facial features will be mapped and used to develop a facial shape classification model. The recommendation system will be based on hair styles that are tagged to each face shape. In the future, the recommendation system could mature to also being based on the preferences of both the user and her similar peers.

Embedded in a salon's mobile app, this system allows the user to upload an image of their face, determine their facial shape classification and select and save a gallery of recommended hair styles. While there are tools on the internet that help you to make these important styling decisions, they are either based on manually selecting your face type [1] or aligning your face with features [2],[3] to help it

determine the shape. An automated facial-shape detection and hairstyle recommender system does not exist today.

The biggest challenge (so far) has been that the training data is relatively sparse and depends on a subjective decision – the shape of a woman's face. I have already found that there are contradictory opinions of some celebrities' face shapes, so I have developed a method to select the most agreed-upon classification for my training set. This problem is my motivation for this project - to provide a more systematic way of determining face shape based on facial recognition and feature detection – not opinion.

Resources:

[1] http://www.thehairstyler.com/features/articles/hairstyles/face-shape-quiz

[2] http://fluttereyewear.com/face-shape-application

[3] http://www.trylive.com/demos/trylive-eyewear/face-analysis