**ABSTRACT**

"Face It" is a mobile application that uses machine learning, specifically a convolutional neural network, to determine a user's face shape and then combines this information with user-inputted data to give the user a personalized set of hairstyles that are guaranteed to make the user look his best. A personalized list of tips is also generated for the user to take into account when he is getting a haircut or growing his hair out. With this combination of personalized hairstyles and tips, we hope to make the process of getting a good looking haircut simple and stress-free.

**HOW IT WORKS**

1. The user begins by using the front-facing camera to determine his face shape
2. The user then selects various preferences about his hair and face
3. After doing so, the user can view hairstyles that he can get or read tips that he can use
4. The user can pick and choose which hairstyle he likes best and show his barber

**MACHINE LEARNING**

For the face shape recognition part of the application we used a process called machine learning. We chose to use machine learning to train a **convolutional neural network (CNN)** since CNN’s are best for image recognition.

A CNN consists of multiple layers including a convolutional layer, pooling layer, ReLU layer, fully connected layer and loss layer. Each of these layers perform a function that alters the image being passed through the model in a certain way. These layers can be organized in various different orders called architectures depending on what you want your CNN to do.

**DATASET**

- The CNN was trained on 6 different face shapes: diamond, oblong, oval, round, square and triangle
- Our dataset consisted of approximately 150 images of males with each face shape. These images were collected from reputable hairstyle articles and Google Images.
- A large dataset is needed to ensure that every angle and position of an image is encapsulated and trained through the convolutional neural network.
- The images were kept in various folders named after whatever face shape that they represented and these folders were fed through the convolutional neural network.

**FUTURE PLANS**

- We plan on publishing a prototype version of this application on the Google Play Store. Updates on this will be available on my Intel DevMesh account which you can find under the ‘Project Links’ box
- If enough interest is shown we will keep adding on to the application. Some features we would like to work on include:
  - applying real-time hair filters to the user with the recommended hairstyles
  - adding a social aspect to the application where the user can save and share the hairstyles he was recommended

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