



Virtual Hanfu Fitting Room

虚拟汉服试衣间

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Problem Description

- The client manufactures and distributes hanfu and other traditional Chinese fashion products
- They wish to promote their items in a way that allows the consumer to visually see what they look like
- A variety of options and parameters will be required



Brainstorming Ideas

Red & Gold Overlay

Add red and gold decorations to make the image festive for Chinese New Year

Red & Gold Clothing

Change the color of the user's clothing to make it red and gold

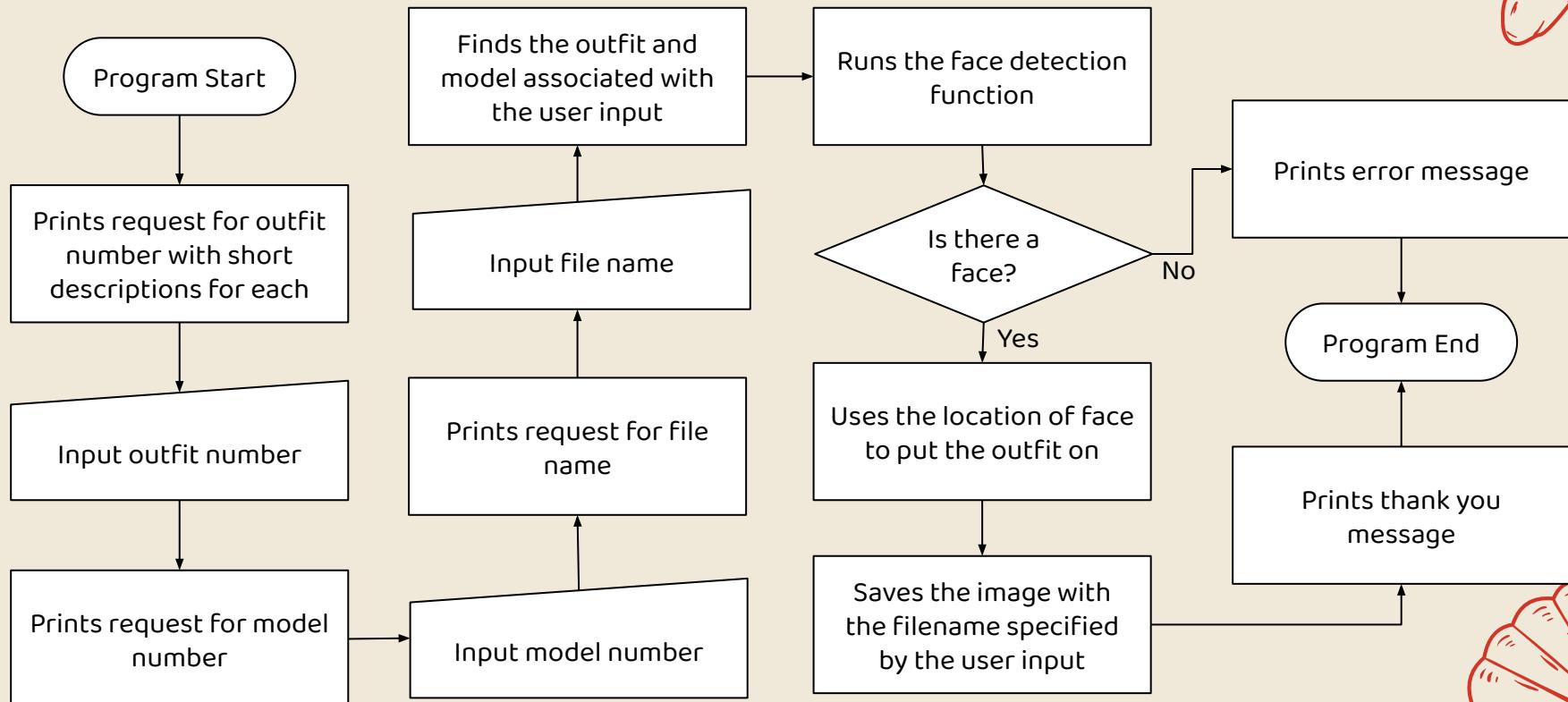
Traditional Clothing

Replace the user's clothing in the image with hanfu

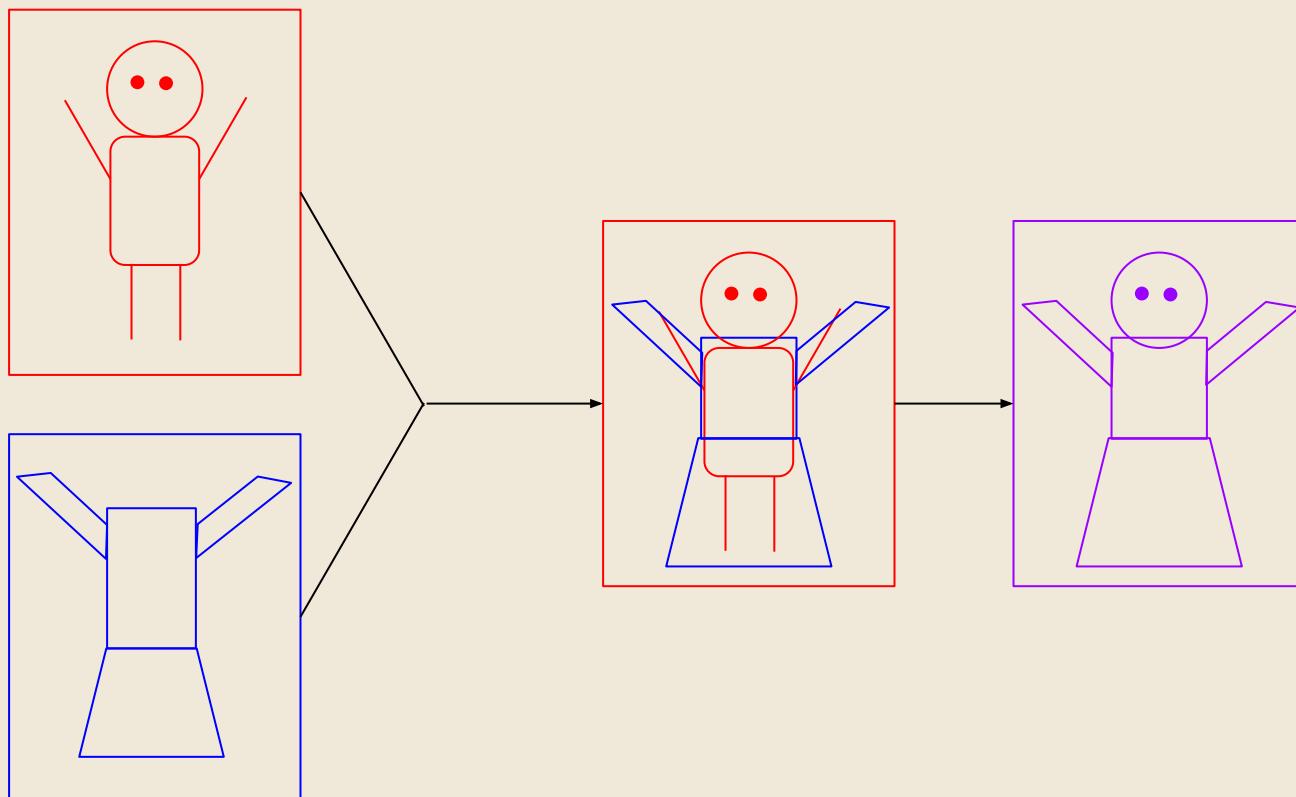
Traditional Hair Styles

Overlay an image of a traditional hairstyle on top of the user's hair

Program Flowchart



Sketch of Proposed Idea



Raw Images Used (People)



Images used with the verbal permission of
Michael Chen, Andrew Eng, Jue Gong, and
Amanda Lin

<https://media.istockphoto.com/photos/full-length-portrait-of-a-corpulent-man-posing-picture-id1307214736?s=612x612>

https://media.istockphoto.com/photos/her-style-is-her-own-picture-id514107679?b=1&k=20&m=514107679&s=170667a&w=0&h=9GbDf9r250Oql9ZHkXYsw0z6s_U8tEv5A5riUsmd2Fw=

Raw Images Used (Dresses)



https://img.joomcdn.net/34e4990c90a04cd14984659fc5662e8e121c4a58_original.jpeg



<https://img.pddpic.com/mms-material-img/2021-04-20/ea5989ff-01b4-445e-9694-978687d1ff07.jpeg>



https://pic4.zhimimg.com/80/v2-bea03a4f2340e8ddd6e9b9cf8ea743_1440w.jpg



<https://www.zhongguofeng.com/uploads/allimg/170318/6-1F31QA227.jpg>



https://img.alicdn.com/i4/2835046187/O1CN01XlcNFV1vZh3DyCLMi_!!2835046187-0-lubanu-s.jpg_400x400q90



<https://i.pinimg.com/736x/78/18/97/7818974db0890c670f6bbfb55d203966.jpg>



<https://pic1.xuehuaimg.com/proxy/baijiahttps://f12.baidu.com/it/u=1954695875,733520552&fm=173&app=25&f=JPEG?w=580&h=869&s=8680BE4CCAEC541FD52464FA03008092&access=215967316>



https://m.media-amazon.com/images/I/51yo2yQt2pL.AC_UX679_.jpg



https://img.ruten.com.tw/s0/fad/83b/yintian05/1/5f/df/22035232484319_382.jpg

Calculating Body Proportions

Using an image, the necessary dimensions for body parts were calculated based on the head proportions.

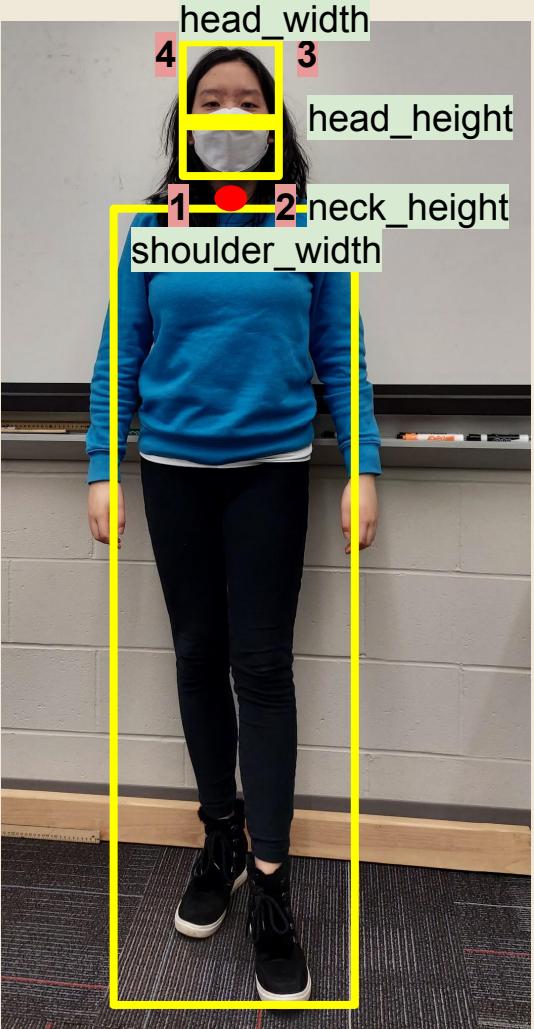


Image used with the
verbal permission of
Amanda Lin

Array of Image Results



Process of Image Manipulation

The MTCNN library is a pre-trained machine learning model which utilizes a convolutional neural network to determine the location of the face and other facial features. Using this library, we determine the coordinates for the location of the face in the picture. These coordinates are then used to extrapolate the size and location of the body. The dress images have already been pre-processed by having their backgrounds removed. Using the data on the size and location of the body, the dress image is pasted onto the image of the person. Then, the final image is saved to the Results folder.

MTCNN code source: <https://github.com/ipazc/mtcnn>

Solution Analysis

Strengths

- Solution works as intended
- The image of the dress is pasted in the right spot onto the image of the person
- The user can clearly see how the outfit looks on a person

Weaknesses

- Does not take varying body sizes and proportions into account
- Takes a long time for the program to run
- Sometimes the face recognition machine learning model does not work (especially with masks)

Future Improvements

- Add more features (e.g. a frame, a filter, a watermark, different hairstyles)
- Create a GUI
- Train or find a pre-trained a face recognition model that is more accurate and can take into account masks
- Allow the user to more easily adjust the ratios of shoulder width and height
- Allow the user to use their own custom images more easily (for example, upload the image to a folder and have the file name be a user input)
- Automate the dress image pre-processing process (i.e. cutting out the background)



Conclusion Question #1

Adrian's viewpoint is accurate, but Zach also has a point. There is no such thing as a "real" image because every image is in some way manipulated. As Adrian states, even the human eye manipulates images in order to process them and send the data to the brain. The way that we perceive images is always manipulated, but we do perceive what we see as accurate. In this way, I think that Zach is partially correct even though his proclamation is unnuanced. It is true that certain kinds of manipulations are accurate, while others are lies. Images that we view through our own eyes or images that are taken with a camera preserve the features of the image, and those manipulations are what Zach would consider "lies". On the other hand, other types of image manipulation such as Photoshop would be what Zach considers "inaccurate". However, Zach does not provide any support or examples for what he considers to be a "real" image and simply proclaiming it to be true is an overly facile statement. Therefore, Adrian's ideas are the most accurate, even if Zach does have some good ideas.

Conclusion Question #2

To Use

You can use an image if you have personally taken it. Images taken by others or that are downloaded from websites are acceptable as long as the sources are credited.

To Sell

You can sell an image if it is one that you have personally taken. If it contains someone else's face or body, you must receive their permission and come to an agreement first. If someone else took the image, you must buy the rights for the image and/or receive their permission.

To Distribute

You can distribute an image if you have personally taken it and it does not contain someone's face or body in it. If it does, then you must receive their consent before distribution. If you make significant changes to a downloaded image, you can distribute it, as long as you credit the original image.

The Laws

If an image is copyrighted, no one else can use, distribute, or sell the image unless it falls under fair use. Generally, this means that if the image use benefits the public, then copyrighted images can be used without authorization of the person who originally created the image. Educational purposes normally fall under fair use.

Source: <https://www.rivaliq.com/blog/guide-copyright-fair-use-laws-online-images/>

Conclusion Question #3

Our team dynamic was really positive, and we worked together well. We divided the work evenly, and each of us knew what features we were responsible for individually. We worked together to test and debug the code, especially because Jue was unable to run the machine learning code on her computer. We both knew that each of us had our own strengths, and we played to those strengths.

Sometimes, it was easy to get frustrated, especially when Github was being slow or not working altogether. In the future, we could work on being more patient, especially with technology.



Division of Labor

Amanda

Implementing the MTCNN code
in the find_face function

Coding the user_input and
select_images functions

Slideshow presentation &
conclusion questions

Testing, debugging, and
commenting code

Record Flipgrid video

Jue

Finding images of dresses

Coding the put_on_dress
function (including calculating
the body proportions based on
face size)

Poster

Testing, debugging, and
commenting code

Record and edit Flipgrid video

Thank you!



谢谢 !