Welcome to the psycho-physical experiment on Content-Color-Dependent Screening (CCDS) halftone image quality assessment. The estimated total duration of this experiment is about 60 minutes. Please read the content below carefully before you start.

Introduction

This experiment contains one section. The total number of image contents you will need to evaluate is 30. For each content, two zoom-in areas will be evaluated. Also, some stimuli will be duplicated to test the consistency of your judgements. In this case, a total 70 pairs of zoom-in areas will be evaluated.
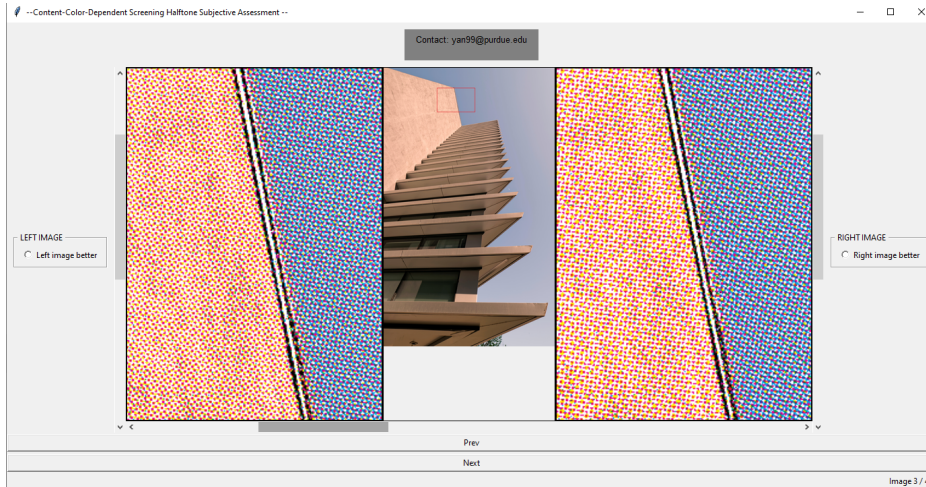

Figure 1: A screenshot for the graphical user interface.

For the same zoom-in area, the halftoned images generated with two different methods will be shown simultaneously on the screen side by side as shown in the Figure 1. The image shown in the center is the original continuous-tone image with a red box approximately indicating the cropped zoom-in area. You will need to decide whether you prefer the left image or the right image based on the overall smoothness and lack of visible periodic artifacts in the zoom-in areas of the two images. There are scroll bars at the bottom and the side of the two zoom-in areas. It will be very important that you scroll over the entire zoom-in areas before making your decision. Generally, it will the easiest to see the difference between the two images if you focus on regions that should be smooth. You may need to look at the images for some time before the differences become apparent.

Precaution

- The code is written in Python 3.

- It may take up to 10 minutes to load the graphical user interface window.

- In the experiment, there may be some delays with the GUI pages. Please do not click on the GUI window until all widgets show up.

- Sit at a comfortable viewing distance (about 24in/60cm away from the screen). You could make small adjustments to the viewing distance if you feel it is necessary.

- **Do not skip any of the images or quit the GUI window in the middle of the experiment.** If you do so, your ratings will not be saved.

- After you finish rating all images, click on "Done" to save and exit the GUI. Then, you are finished with the experiment; and two **.txt** files will be generated.

Experiment

Setup

- Download the experiment from `https://github.com/yan99/CCDS_Experiment.git`

- Open `CCDS_Experiment` folder in a terminal window.

- Install the required Python packages by typing "**pip install -r requirements.txt**" in a terminal window.

Procedure

- Run "**python3 main.py**". The graphic user interface will be prompted. This may take up to 10 minutes. Please wait patiently.

- You can use the scroll bar to check the zoom-in image and view the zoom-in image from any distance. Choose left or right image which you prefer by clicking on the radio button. If you find it is hard for you to decide, just click either one.

- Click on the "Next" button at the bottom to go to next page. You can go back to previous page by clicking the "Prev" button. Please note that if you revisit the previous pages, the ratings of all these pages will be cleared and overwritten.

- When your assessment is completed, a message "Please click on 'Done' to save and exit" will appear. After clicking on the "Done" button, the results will be saved into two **.txt** files.

- Please note: if you accidentally skipped some images, you will be prompted the image numbers that you missed after you click on "Done" as a warning pop-up window. However, since you will still need to click the "Prev" button to go back to the specific image, I recommend you to make sure you do not skip any image.

- Please email the two **.txt** files to yan99@purdue.edu.

Training

In this section, some key tips will be discussed to illustrate where the main differences are located.

In some cases, the difference between the two zoom-in areas may be difficult to see at the first glance. As mentioned previously, please be sure to scroll over the entire area of the zoom-in images, and focus especially on areas that should be smooth. The visibility of periodic patterns in these areas should be minimized. You may need to look at the pair of images for a few minutes before the differences between them become apparent. For example, in Fig. 2 shown below, the image on the right would be preferred.
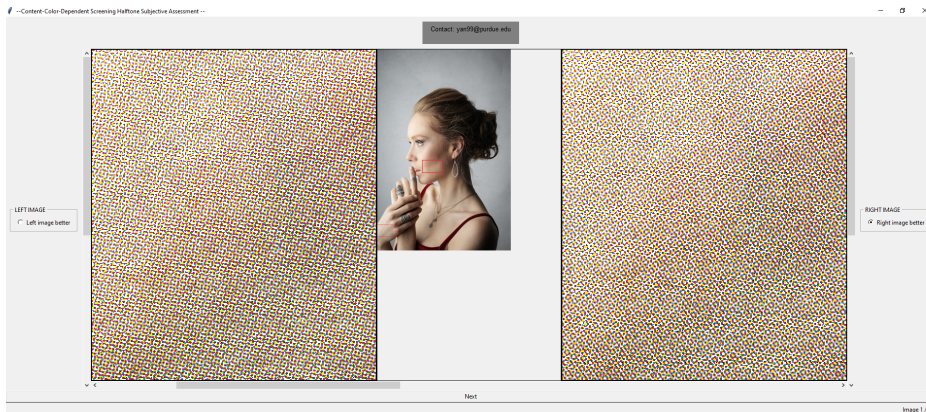

Figure 2: Example 1.

Please ignore any color differences that you observe between the zoom-in image and the full image. In practice, these differences would be eliminated by the color management process.