

Assignment 6

CS283, Computer Vision
Harvard University

Due Fri, Oct 20 at 5:00pm

This assignment briefly reinforces some concepts from image processing and multi-resolution image representations, and it gives you an opportunity to make an informed decision about your final project topic. As usual, the assignment will be submitted electronically and formatted according to the guidelines.

1. (30 points) In this problem you will create a hybrid image as described in Oliva et al., “Hybrid Images.” (Proc. SIGGRAPH 2006) and at <http://cvcl.mit.edu/hybridimage/>.

Find two grayscale images I_1 and I_2 that you want to blend. These should be reasonably well aligned, with the two subjects occupying more or less the same part of the image plane. It will be easier if you make them monochromatic (grayscale). Construct a hybrid image from I_1 (to be seen from close-up) to I_2 (to be seen from far away) as

$$I_{\text{hybrid}} = h * I_1 + (I_2 - h * I_2),$$

where $h(x, y)$ is a suitable 2D low-pass filter of your choice.

Experiment with different low-pass filters until you achieve the desired effect of seeing I_1 when you are close to your display and I_2 when you move back by a meter or two. Describe how the choice of low-pass filter affects your perception of the results, and explain why. Submit your input images, code, results, and discussion in a single `.mlx` file, with the images stored in the `./data/` folder of your ZIP archive as described in the submission guidelines.

2. (required) Browse the list of topics on the [Final Project page](#). Identify at least five that catch your interest, find those five papers online, and read (at least) the abstracts and figure captions of each one. Identify your three top choices for your final project topic, and submit these choices using [the survey on the course website](#).