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CS 445 - Project 3: Gradient Domain Fusion

Complete the claimed points and sections below.

Total Points Claimed [100] / 160

Core

- | | |
|--------------------------------|-------------|
| 1. Toy Problem | [20] / 20 |
| 2. Poisson blending | [50] / 50 |
| 3. Mixed gradients | [20] / 20 |
| 4. Quality of results / report | [10] / 10 |

B&W

- | | |
|------------------------------------|------------|
| 5. Color2Gray | [0] / 20 |
| 6. Laplacian Pyramid Blending | [0] / 20 |
| 7. More gradient domain processing | [0] / 20 |

1. Toy problem

Include

- The “Max error is: xxxx” line

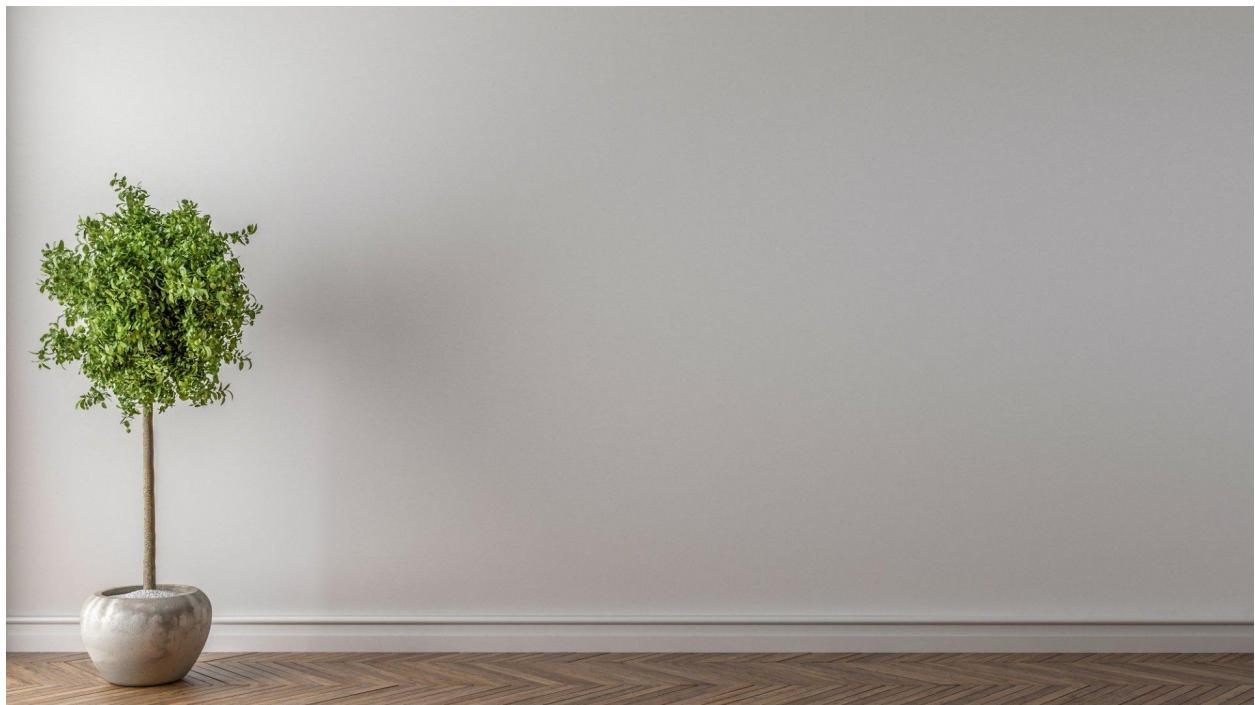
Max error is: 4.454214774796128e-13

2. Poisson blending

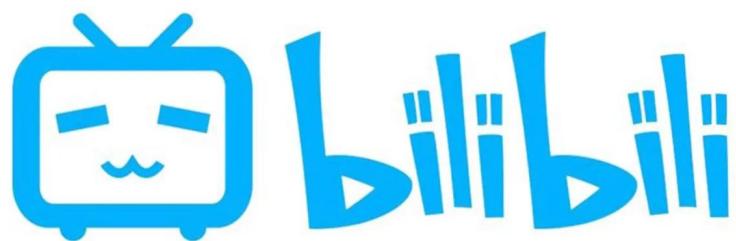
Using your own images (not sample images), include:

- Your favorite blending result, including: (1) background and object images; (2) pasted image with source pixels directly copied onto target background region (can use `utils.get_combined_img`); (3) final blend result. (30 pts)
- At least one more good result (10 pts)
- At least one failure case, where the result is bad. Explain why it doesn’t work. (10 pts)

Background image



Object image



Copy-and-paste image



Poisson blending image



One more good result



Failure case



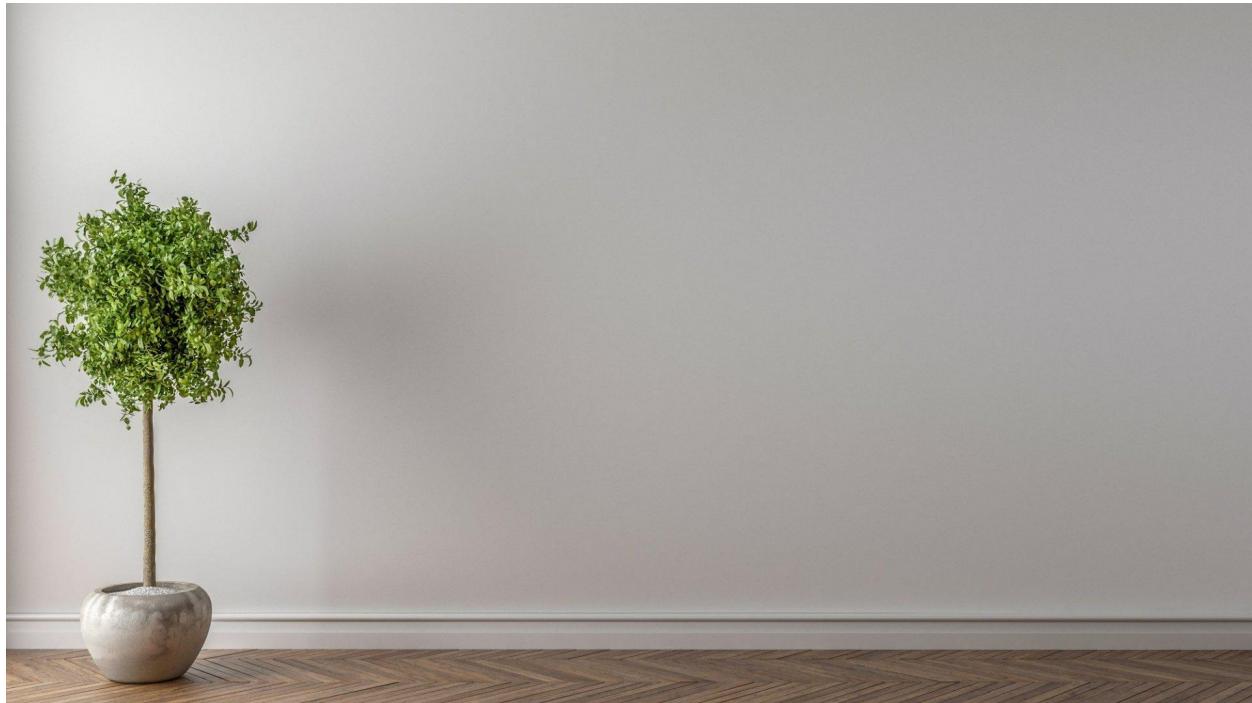
In this case, the background image has texture while the object image is plain white. The Poisson blending simply replaces the background pixels in the target region with the object pixels and thus can not preserve the texture of the wall.

3. Mixed gradients

Using your own images (not sample images), include:

- At least one result with: (1) background and object images; (2) pasted image with source pixels directly copied onto target background region; (3) final blend result.

Background image



Object image



Cope-and-paste image



Mixed gradient blending image



4. Quality of results / report

Nothing extra to include (scoring: 0=poor 5=average 10=great).

5. Color2Gray (B&W)

Include

- Color and grayscale of colorBlind8.png and colorBlind4.png, where grayscale is created by your code
- Color and grayscale of one natural image, where grayscale is created by your code
- Explain your method/constraints

6. Laplacian Pyramid Blending (B&W)

Include

- For at least one example, compare copy-paste, poisson, and laplacian pyramid blending. Include the object and background source images, and the blended results for each method. You can use different masks for different methods.

7. More gradient domain processing applications (B&W)

Include

- Show at least one example for each method that you implement. Explain the constraints used for each method. Something relatively complex like colorization is worth full points. Simpler applications like non-photorealistic rendering can also be worth full points if multiple variations are shown or clever methods used.

Acknowledgments / Attribution

List any sources for code or images from outside sources

- Background images: <https://pixabay.com/images/search/wooden%20wall/>
- Bilibili icon: <https://thebusinessofesports.com/2023/01/03/bilibili-forced-to-make-layoffs/>
- <https://medibang.com/picture/1m1708120004417820003366503/>