Experimental evaluation & report

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Equipment:

I used front camera of iPad pro for this assignment . In order to get a good quality picture, I lock the Automatic Exposure and focusing.

Range of imaging condition:

1. Different materials: transparency of the object changes

2. Different backgrounds: Huge difference in background's colour vs background's colour close to each other

3. Different backgrounds: Pure colour backgrounds vs. colourful backgrounds.

4. Different foreground material: Observe what if the object contains liquid.

Procedure:

1. Stable the iPad pro, and the 2 background. Background A is in front of Background B so I can switch from background A to B easily.

2. Adjust the camera of iPad pro. Lock the auto exclosure and auto focusing.

3. Take picture of Back A

4. Remain the position of background A, put object in front of the background.

5. Take picture of Comp A.

6. Carefully remove background A, background B is just behind background A. take picture of Comp B.

7. Take picture of Back B.

Observation:

Each picture in the first row from the left to right: back A, back B, comp A, comp B.

Each picture in the second row from left to right: colour out, alpha out, background pic, composition

<u>Experiment 1:</u> Change the transparency of the object while trying to remain the background colour un changed

Condition 1: with normal background and a **opacity** object

Condition 2: Object **partly translucent**. keep the background unchanged

Condition 3: Object is **nearly transparent**

Conclusion 1:

The algorithm performs well with the transparent object. However, as the transparency increases, the matted object looks not true to the reality. There are many dirty spot on the cup, but its colour is too close to the white background causing the inaccuracy in calculation of alpha.

One of the good thing is that, since the background has nearly pure colour, the refraction is of the colour is reduced.

Thus, it is better to use the background that has a colour different from the object.

Experiment 2: Background **colour** close to each other vs. Background colour far from each other.

In addition, one of the background has many shade.

Condition 4: Background colour close to each other
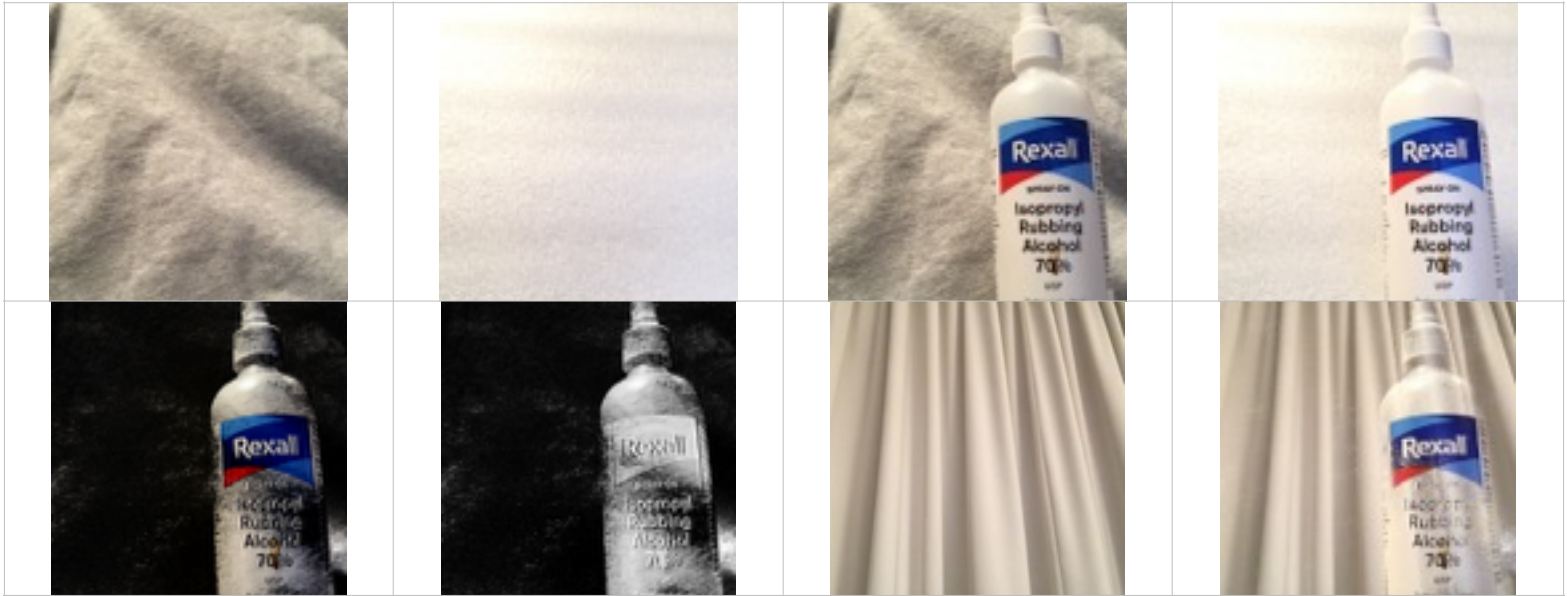
Condition 5: Backgrounds that have big difference in colour

Conclusion 2:

Condition 2 definitely performs better.

The reasons are:

1. The the two background's **colour are too close** to each other. Some pixels in the background may have the same rgb and alpha as the object. So that, the algorithm can not perfectly recognize the background and the object.

2. In addition, the background in condition 1 has many shades and texture, This would also be the consequence of low quality result.

Experiment 3: Colourful backgrounds

Condition 6: Background that have colour pattern
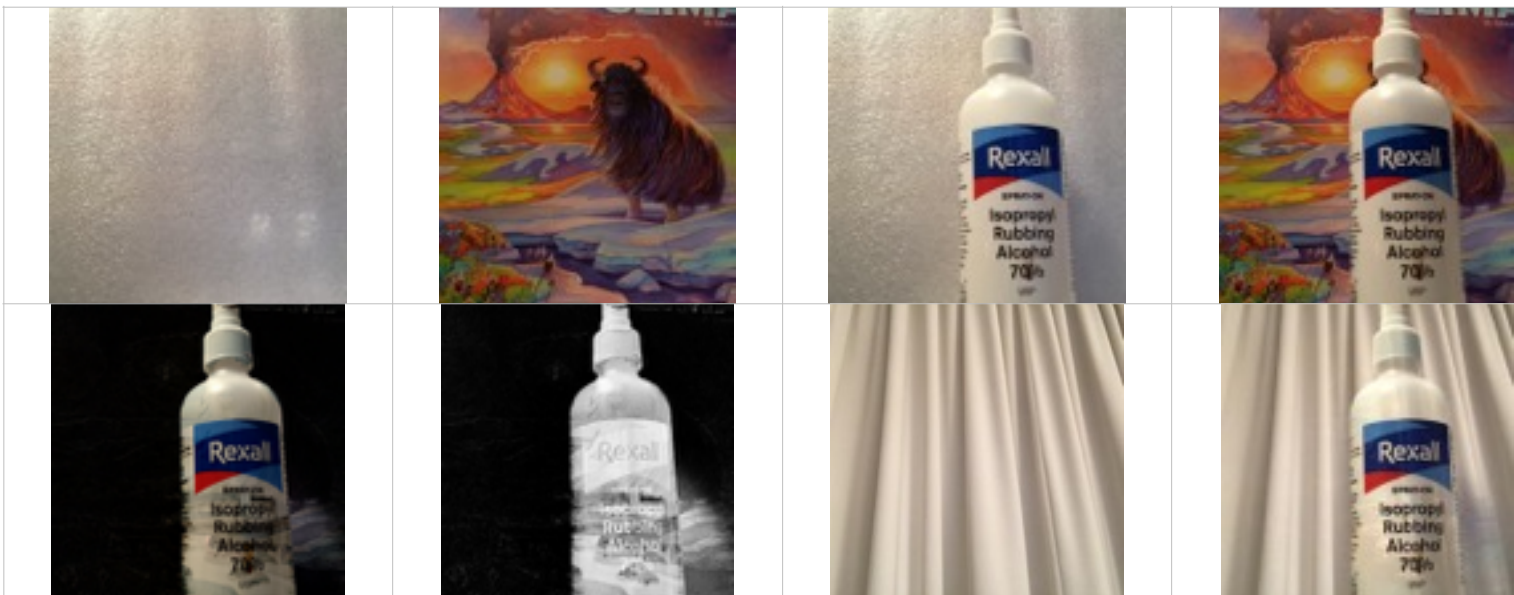
Condition 7: Background that doesn't have many colour: Just the same as condition 5 in Experiment 2.

Conclusion3:

The background that have many colour pattern doesn't perform well. Therefore, our algorithm can not distinguish the object well from the colourful background. The background may contain the same colour pixel as the object.

Experiment 4: Object that contains liquid

Conclusion4:

The result are quite good. However, the refraction does't happened. If the result is true to the reality, the curtain should change its shape.

Summary

Therefore, my algorithm triangulation produce good quality result when:

1. The object is opacity

2. Huge background difference

3. Background that does not have many colour

4. Object without liquid

Technique Limits:

1. The background image should be different from the object

2. The background A and B's should not have same colour

3. refraction happens when dealing with liquid

4. Inaccuracy when dealing with colourful background

5. The shadow on the background will effect the result

Part 4:

| back A | comp A | back B | comp B |
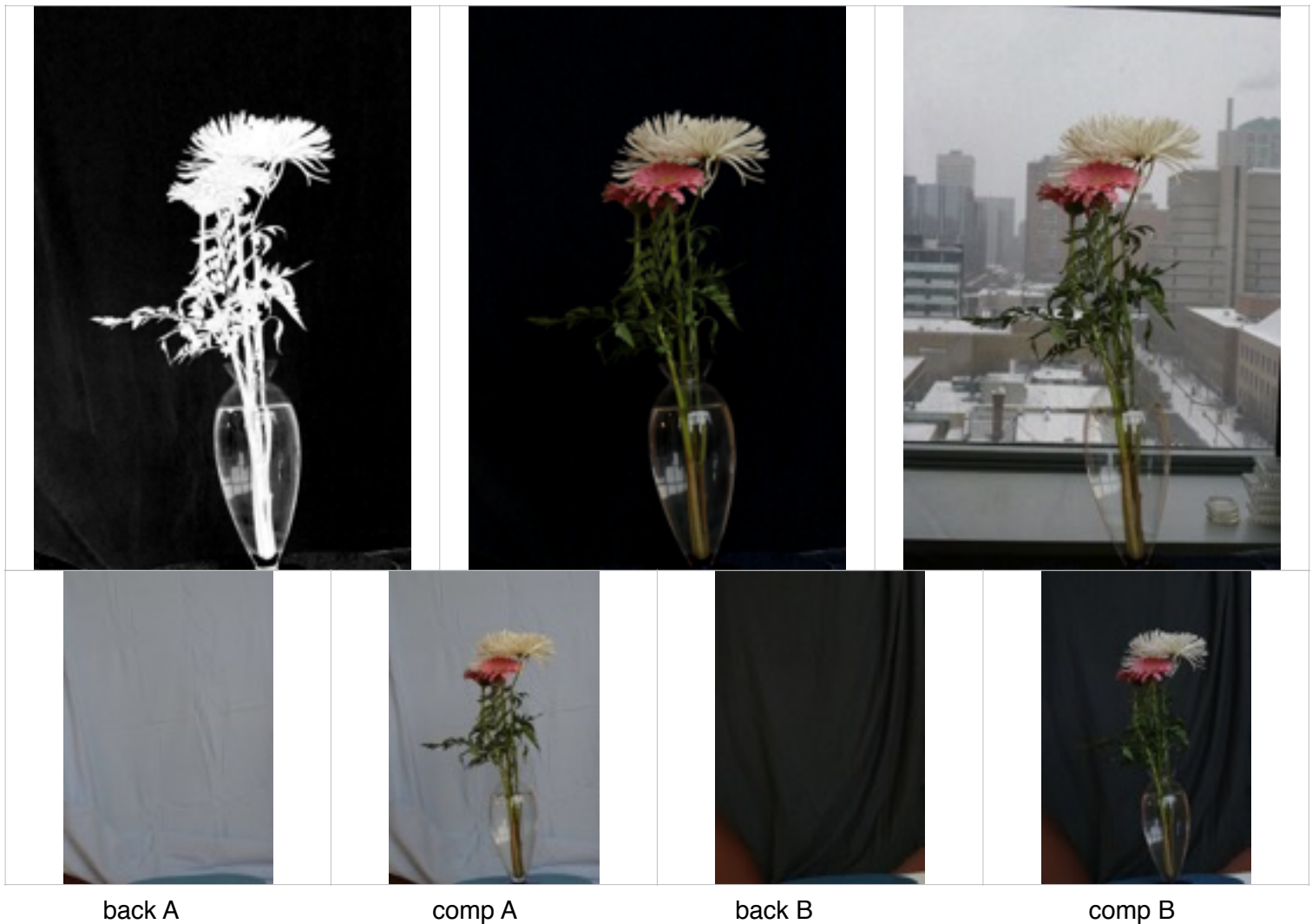
This is because of the vase. When the object is in front of the background, the background in compA and the background in backA actually are not the same.

If we look at back A and compA clearly, we can see that there are shadow of the object on the background. The shadow are mainly on the left side of comp A because the light is from the right. Which makes left-side background of comp A slightly different than left-side background of back A.

When doing triangulation matting, the value of calculated alpha is not totally zero due to the difference above.