Assignment 02

Group Number	02
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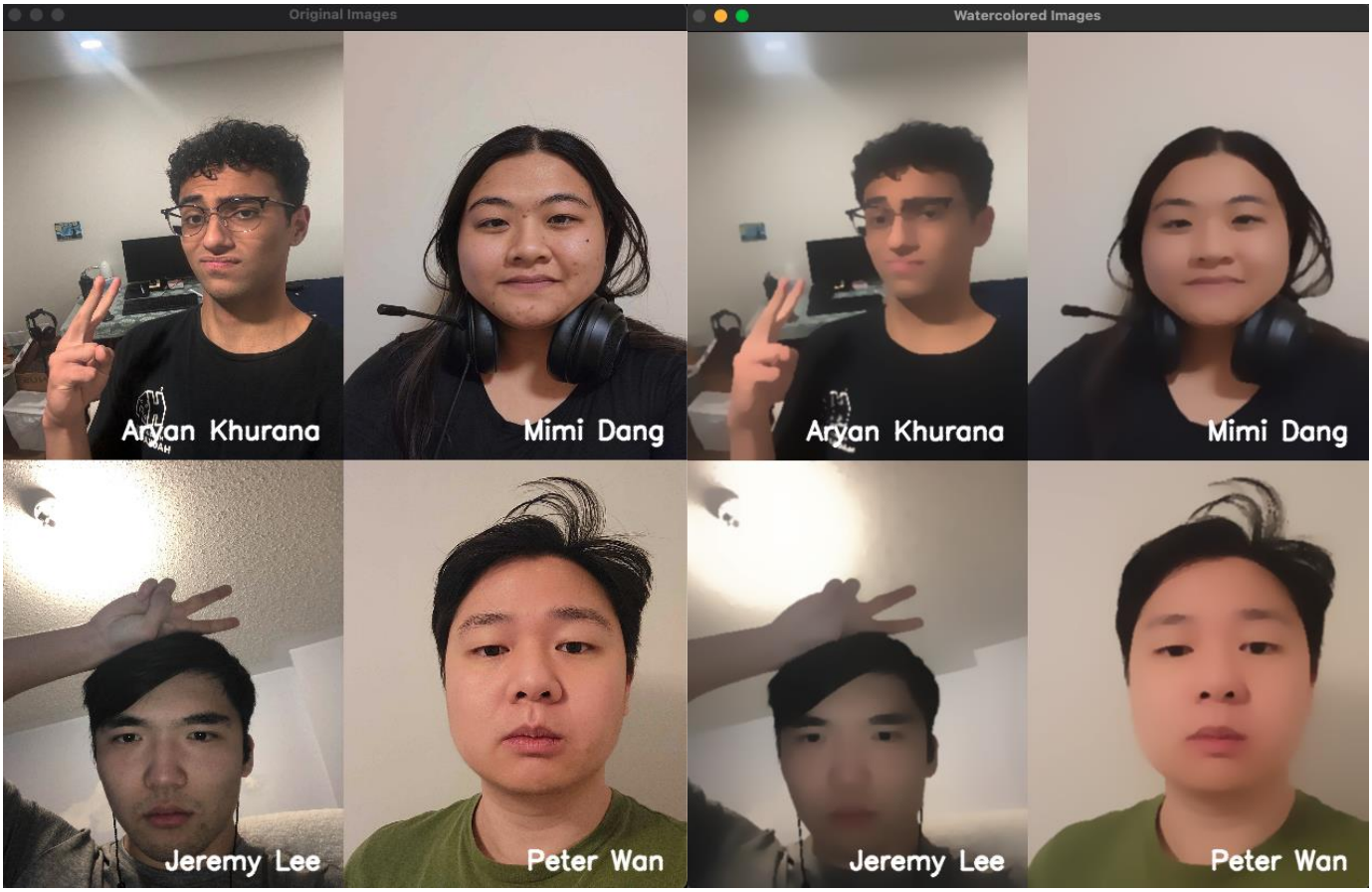
Academic Integrity Declaration

We, **Group 2**, (Mimi Dang, Peter Wan, Aryan Khurana, Jeremy Lee), declare that the attached assignment is our own work in accordance with the Seneca Academic Policy. We have not copied any part of this assignment, manually or electronically, from any other source including web sites, unless specified as references. We have not distributed our work to other students.

Before (Left) → After (Right)



Reflection

This reflection outlines the process of transforming images using various blurring techniques to create a water-colored effect. The approach involves resizing the images, applying a sequence of blurring and filtering functions, and finally stacking the results for comparison.

The key transformation functions used are **median blur**, **bilateral filter**, and **Gaussian blur**.

1. **Median Blur**:

This function is applied using a kernel size of 3 and an iteration count of 1. The purpose of the median blur is to reduce noise while preserving the edges, which is important for maintaining structural details. Fewer iterations (1) are used to prevent over-blurring, ensuring that details remain sharp.

2. **Bilateral Filter**:

The bilateral filter was applied multiple times with varying parameters to balance smoothing the image and preserving edges. This filter works by considering both spatial distance and color intensity, allowing it to smooth similar-colored areas while keeping edges sharp—essential for the watercolor effect.

We first applied the filter with a larger diameter (7) and lower sigma values (20) to achieve broader smoothing, reducing noise but preserving key edges. Then, we used a smaller diameter (5) and higher sigma values (30) to apply finer smoothing. This second pass helped blend colors more smoothly without losing much detail.

By experimenting with these settings, we found the optimal combination that produced a painterly effect, maintaining enough structure while softening the image. This trial-and-error process was crucial in fine-tuning the watercolor effect.

3. **Gaussian Blur**:

A light Gaussian blur (kernel size of 3x3, standard deviation of 0.8) is applied as the final step to further smoothen the image. This provides a finishing touch without overly blurring the details.

The process was collaborative, with each of us working separately in our own Jupyter notebooks. Afterward, we held a call to discuss the code together, combining our work into a single Python file. Everyone contributed to various aspects of the code, and we helped each other understand the implementation. This teamwork ensured a thorough understanding of the process and a polished final result.