

Algorithm for Automatic Oval Selection in Facial Image Sequences

In my project, I've automated the selection of facial regions in image sequences to create binary masks that highlight only the face, leaving out hair, clothes, and background. Here's how I approached each step:

- First, I loaded all the images from a specific directory into ImageJ. This setup ensures that the entire sequence is ready for processing.
- I then applied Gaussian Blur to the images. This step smooths out noise and reduces minor variations, which helps in enhancing the effectiveness of subsequent filters. After that, I used a Median Filter to further clean the images while preserving important edges.
- For isolating skin tones, I utilized a custom Java plugin to convert the images from RGB to HSV (Hue, Saturation, Value) color space. This thresholding step creates an initial binary mask by highlighting potential facial regions based on skin tone values.
- Next, I converted the processed image into a binary format, where the facial region appears in black and other areas in white. This is essential for distinguishing the face from the rest of the image.
- To refine the mask, I applied morphological operations. These operations help in removing small artifacts and filling in any gaps, which results in a cleaner and more accurate mask of the facial region.
- To standardize the mask, I fitted an ellipse to the detected facial contour. This ensures consistency across images with different face sizes and positions.
- I then inverted the mask to exclude non-facial areas like the background and clothing, focusing only on the face.
- The next step was to clear out the non-facial areas, ensuring that only the face remains visible in the final mask.
- Finally, I saved the processed binary masks in PNG format to a designated directory. This makes the masks available for further analysis or use.

Throughout the process, I looped through each image in the sequence, applying all these steps to ensure uniform processing across the entire dataset.