Stage 1:

1. For Binary layer operations the following steps were used to optimize the outcome:
   1. Apply Gaussian filter with radius of 4.0
   2. Apply Minimum with radius 2.0
   3. Extract the layer
   4. Apply Median with radius 2.0
2. For the convolution use the following Kernel that will smoothen towards the edges

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 2 | 2 | 2 | 2 | 2 |
| 2 | **1** | **1** | **1** | **2** |
| 2 | **1** | **0** | **1** | **2** |
| 2 | **1** | **1** | **1** | **2** |
| 2 | **2** | **2** | **2** | **2** |

The result, of course is not the same as in the first step, as there are two gradual filters applied.

1. In case of rotations, the main difference is that the ears are more visible and distinguishable than before, whereas eyes are not visible at all as the white part of the eye seems darker when the person turns around.

In case of smiles, the difference is visible in the first and last layers. Me applying minimum filter may cause this. Some areas in the face that were included in the layers, now disappear mostly around the lips, where there was previously a shadow.

However, in general the overall image is the same pretty much.