Image Processing Project

Face Enhancement

Team Members

Student Name

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Problem Definition

The problem is to enhance the quality of facial images using digital image processing techniques. The goal is to develop a solution that can improve the clarity, visibility, and overall quality of facial images, allowing for better identification, .analysis, and recognition of facial features

Project Goal

The goal of the project is to leverage digital image processing technology to enhance the quality of facial images. The project aims to develop and implement advanced image processing techniques specifically designed for facial enhancement. By employing various algorithms and methodologies, the project seeks to optimize the visual representation of facial images, with a focus on improving the clarity, contrast, and details of facial features. The ultimate objective is to enhance the visual quality of facial images, enabling accurate face recognition, analysis, and other facial-related applications in various domains, such as security systems, biometrics, and computer vision .research

Methodology

Image Enhancement: Image enhancement techniques aim to improve the visual quality of the images. This can involve adjusting brightness, contrast, and color balance, as well as performing histogram equalization or adaptive contrast enhancement. The goal is to highlight important details and make .the images more visually appealing

Findings

[1]

Image number	Image problem “before”	Image goal “after”	Action done on image”before”	The result of the image
[1]	**Low Contrast** Image “light gray colors”	Fix the contrast of the image to make the gray levels more clear and visible.	Function of **contrast Streching**	The images contrast was fixed properly, and became more visible, and enhanced the visual separation between different elements in the image.

[2]

Image number	Image problem “before”	Image goal “after”	Action done on image”before”	The result of the image
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[3]

Image number	Image problem “before”	Image goal “after”	Action done on image”before”	The result of the image
[3]	**Blurred Image** “face features are not clear”	Fix the blurring in the image so that the features and apperance are clear and visible.	Function of **Sharpening**	The images blurring was gone, enhance the edge details and overall sharpness of an image, it increased the perceived clarity.

[4]

Image number	Image problem “before”	Image goal “after”	Action done on image”before”	The result of the image
[4]	**Blurred Image** “face features are not clear”	Fix the blurring in the image so that the features and apperance are clear and visible.	Function of **Sharpening**	The images blurring was gone, enhance the edge details and overall sharpness of an image, it increased the perceived clarity.

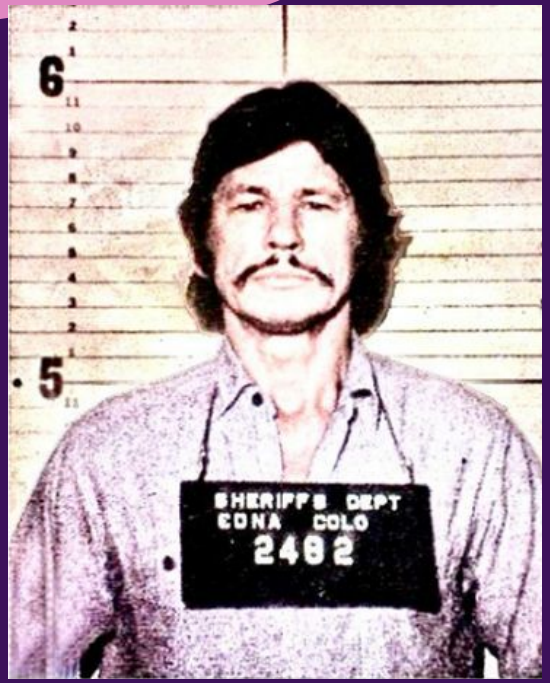
[5]

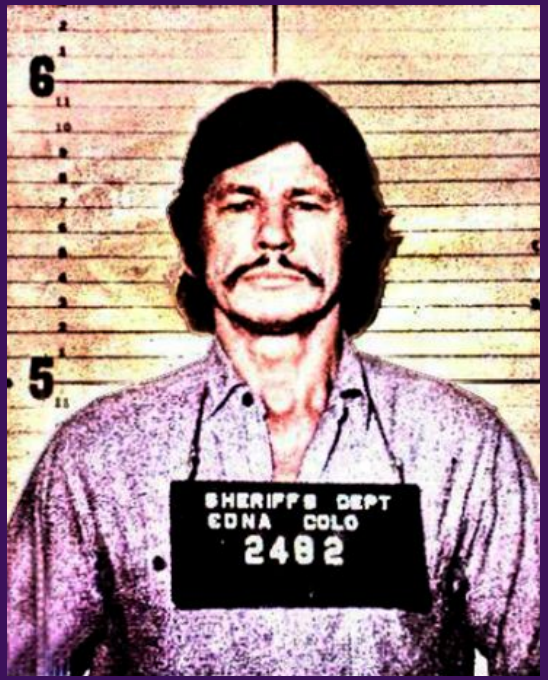
Image number	Image problem “before”	Image goal “after”	Action done on image”before”	The result of the image
[5]	The Image is small and **very sharp**	Fix the sharpness in the image and make the colors of the face more even.	Fixed the image size, applied **Function of gamma correction**, and last applied **function of filtering**	The images sharpness problem got solved, by applying filtering in which it smoothned the image and made the colors enhanced.

[6]

Image number	Image problem “before”	Image goal “after”	Action done on image”before”	The result of the image
[6]	The image’s colors are disturbing and uneven	The image colors should be normal and easy for eyesight and not “neon”.	Function of **Gamma Correction**	The image’s disturbing color prblem was resolved, using the Gamma correction function in which it fine-tuned the mid-tones of an image, resulting in improved overall appearance.

[7]





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[8]


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1.80
1.70
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DIRECCION DE CRIMINALISTICA
DIVISION CENTRAL DE IDENTIFICACION POLICIAL
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[9]


Original Image
5'6"
5'3"
5'0"
4'9"
4'6"
63
60
57
54
SANTA FE COUNTY
ADULT DETENTION FACILITY

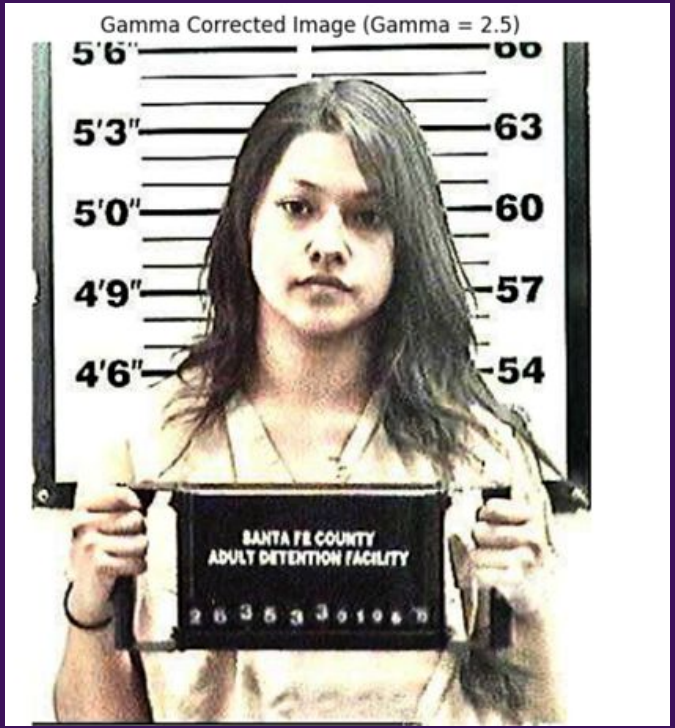
Gamma Corrected Image (Gamma = 2.5)
5'6"
5'3"
5'0"
4'9"
4'6"
63
60
57
54
SANTA FE COUNTY
ADULT DETENTION FACILITY

Image number	Image problem “before”	Image goal “after”	Action done on image”before”	The result of the image
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[10]

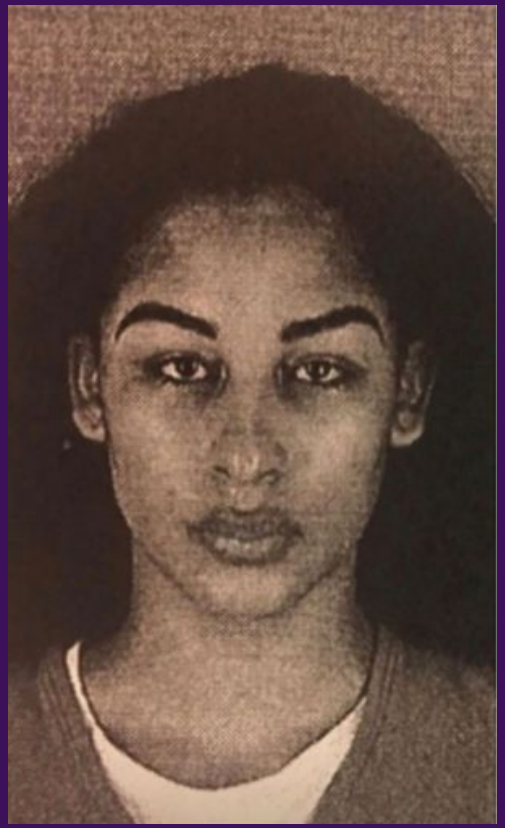
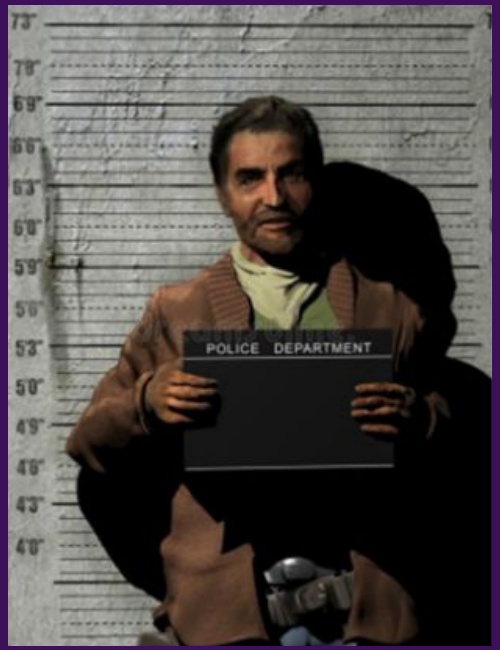


Image number	Image problem “before”	Image goal “after”	Action done on image”before”	The result of the image
[10]	The image is not clear and contains blemishes that affect the image quality	image is the presence of noise, which can degrade the image quality and make it less clear.	Function of **salt-and-pepper noise removal**	The result of applying denoising techniques to a noisy image is an image that is clearer and has reduced noise. The denoising process helps to improve image quality by removing or reducing the unwanted noise present in the original image.

[11]



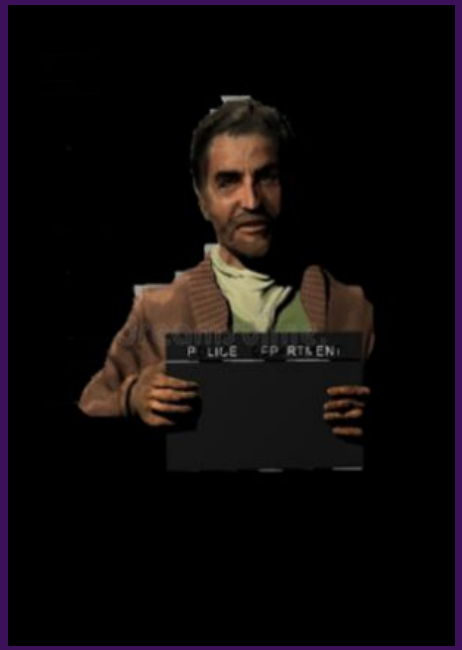


Image number	Image problem “before”	Image goal “after”	Action done on image”before”	The result of the image
[11]	Before removing shadows, the image may undergo various preprocessing steps, such as color correction, contrast adjustment, or histogram equalization. These steps aim to enhance the image's overall quality and make it more suitable for shadow removal.	The problem in the image is the presence of shadows, which can obscure details, create uneven lighting, and affect the overall appearance of the image.	Function of -wise multiplication (*) to remove the shadow pixels	The result of removing shadows from an image is an image where the shadows are reduced or eliminated, resulting in a brighter and more evenly illuminated appearance.

[12]

Image number	Image problem “before”	Image goal “after”	Action done on image”before”	The result of the image
[12]	The image is not clear and contains blemishes that affect the image quality	The problem in the image is the presence of noise, which can degrade the image quality and make it less clear.	Function of **salt-and-pepper noise removal**	The result of applying denoising techniques to a noisy image is an image that is clearer and has reduced noise. The denoising process helps to improve image quality by removing or reducing the unwanted noise present in the original image.

[13]

Image number	Image problem “before”	Image goal “after”	Action done on image”before”	The result of the image
[13]	The image’s colors are disturbing and uneven	The image colors should be normal and easy for eyesight and not “neon”.	Function of **Gamma Correction**	The image’s disturbing color problem was resolved, using the Gamma correction function in which it fine-tuned the mid-tones of an image, resulting in improved overall appearance.

[14]

Image number	Image problem “before”	Image goal “after”	Action done on image”before”	The result of the image
[14]	The image is not clear and contains blemishes that affect the image quality	image is the presence of noise, which can degrade the image quality and make it less clear.	Function of **salt-and-pepper noise removal**	The result of applying denoising techniques to a noisy image is an image that is clearer and has reduced noise. The denoising process helps to improve image quality by removing or reducing the unwanted noise present in the original .image

[15]


6'0"
5'9
5'6"
5'3"
SANTA FE COUNTY
ADULT DETENTION FACILITY

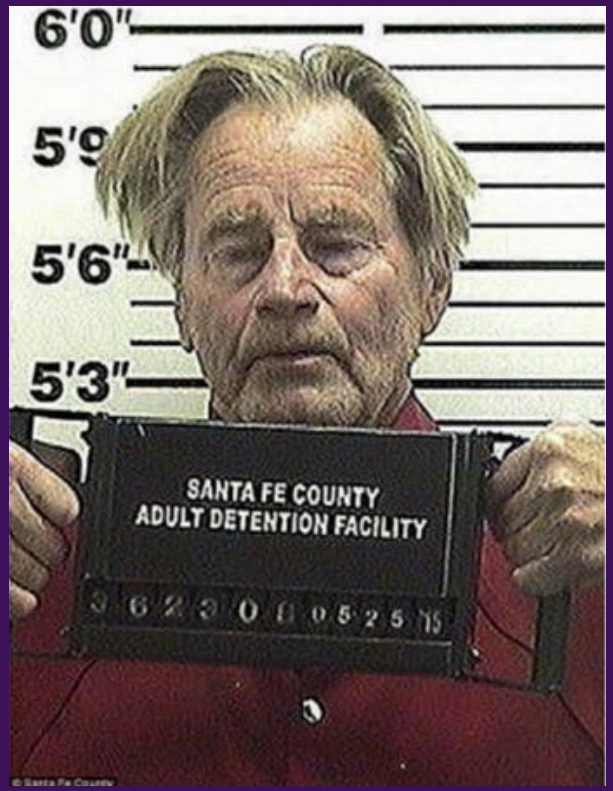

6'0"
5'9
5'6"
5'3"
SANTA FE COUNTY
ADULT DETENTION FACILITY

Image number	Image problem “before”	Image goal “after”	Action done on image”before”	The result of the image
[15]	The image was faded and some details are not clear	Fix the faded in the image so that the details are clear and visible.	Function of **Gamma Correction** **&** Function of **Sharpening**	The image faded was gone, enhance the edge details and overall sharpness of an image.

[16]


Reg No 51
Margt Leadbitter
Lardeen
North Shields


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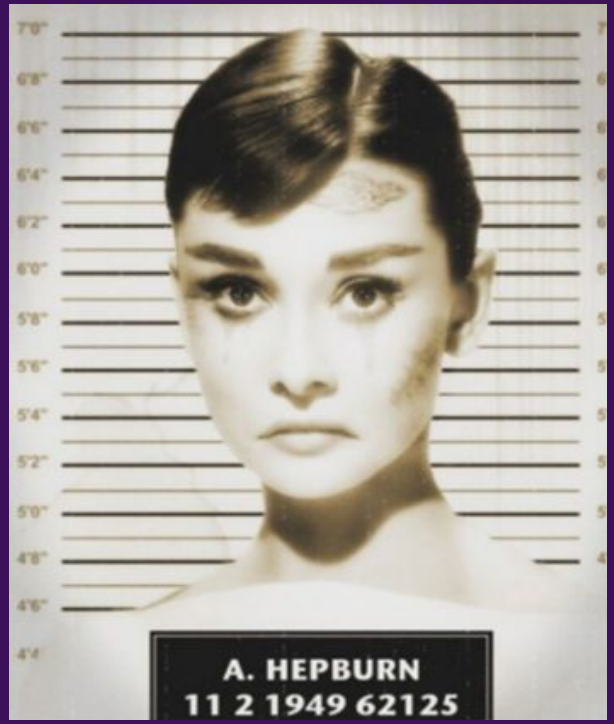
Image number	Image problem “before”	Image goal “after”	Action done on image”before”	The result of the image
[16]	The image was faded and some details are not clear	Fix the faded in the image so that the details are clear and visible.	Function of **Gamma Correction** **&** Function of **Sharpening**	The image faded was gone, enhance the edge details and overall sharpness of an image.

[17]



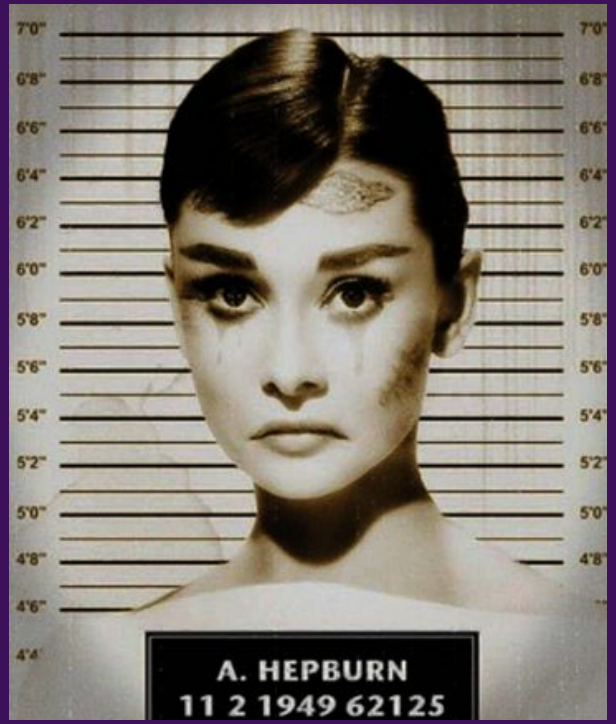


Image number	Image problem “before”	Image goal “after”	Action done on image”before”	The result of the image
[17]	The image has high brightness and because of this some details have disappeared	Fix the brightness in the image so that the details are clear and visible.	Function of **Gamma Correction** **&** Function of **Sharpening**	The image brightness was gone, enhance the edge details and overall sharpness of an image.

[18]

Image number	Image problem “before”	Image goal “after”	Action done on image”before”	The result of the image
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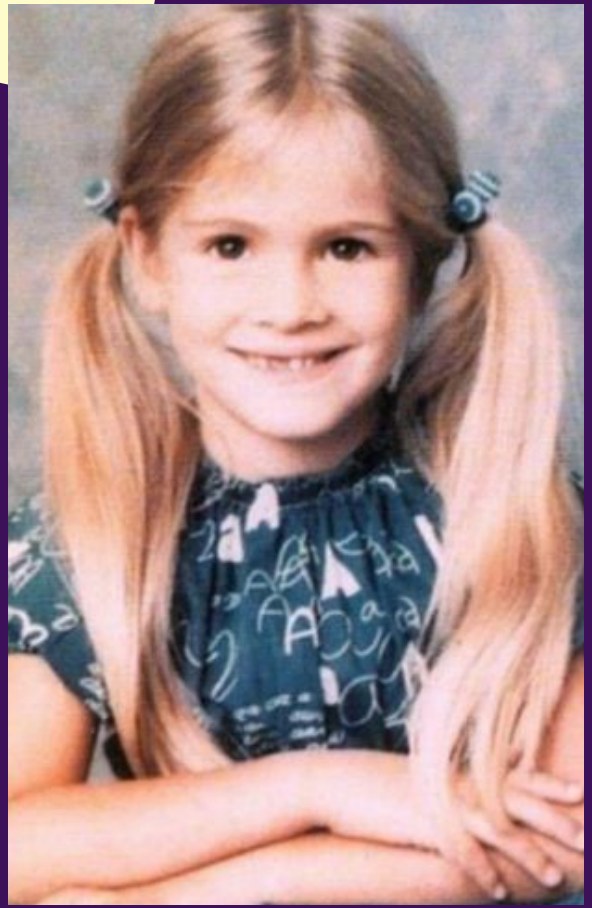
[19]

Image number	Image problem “before”	Image goal “after”	Action done on image”before”	The result of the image
[19]	Low Contrast and because of this some details have disappeared	Fix the contrast of the image to make the gray levels more clear and .visible	Function of **contrast Streching**	The images contrast was fixed properly, and became more visible, and enhanced the visual separation between different .elements in the image

[20]



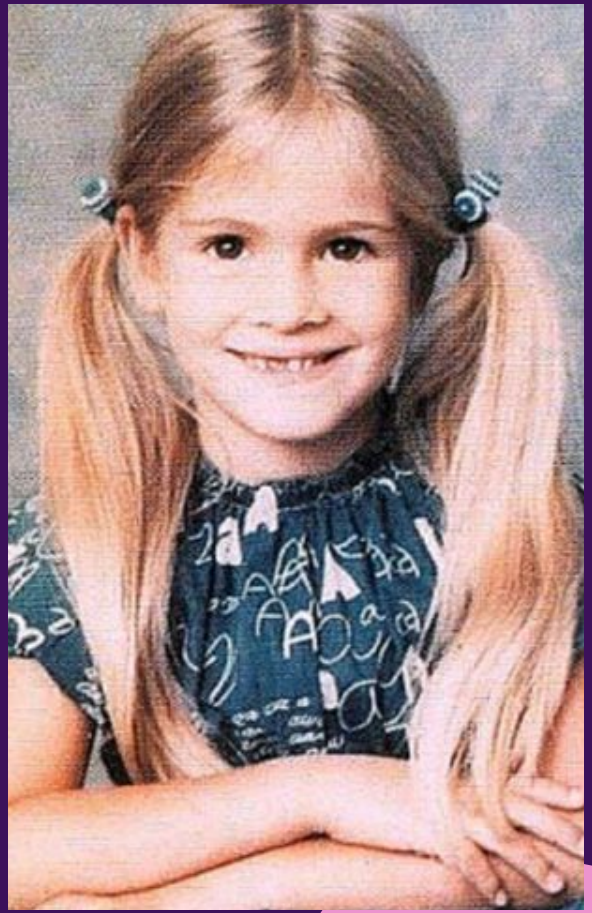
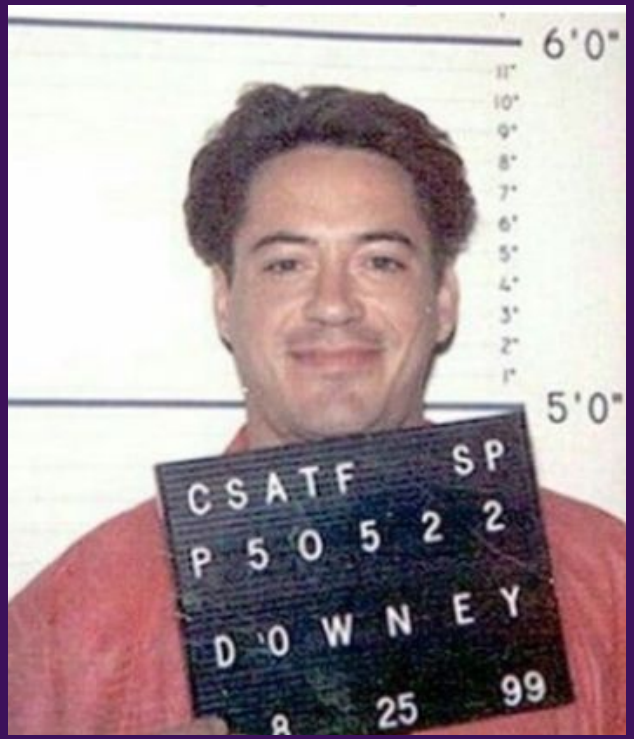


Image number	Image problem “before”	Image goal “after”	Action done on image”before”	The result of the image
[20]	Blurred Image and because of this some details have disappeared	Fix the blurring in the image so that the details are clear and .visible	Function of **Sharpening**	The image blurred was gone, enhance the edge details and overall .sharpness of an image

[21]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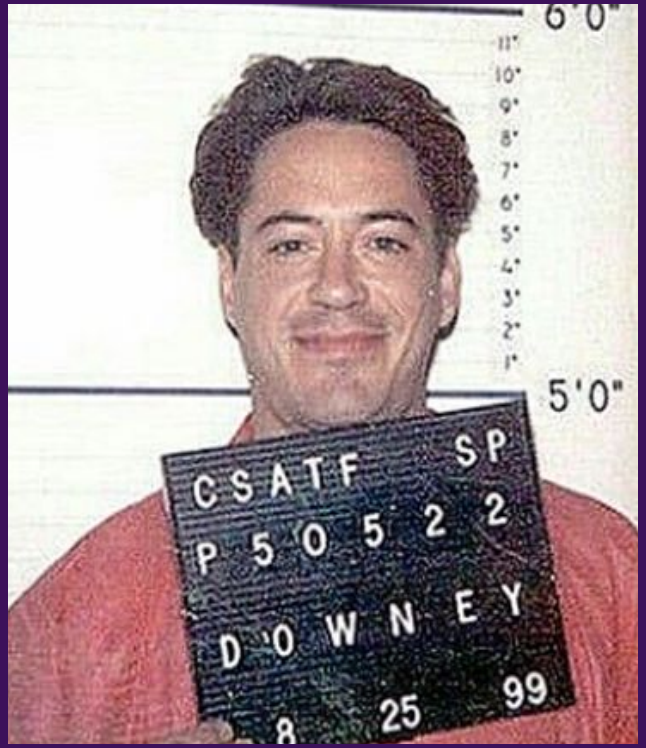
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5'0"
CSATF SP
P50522
DOWNEY
8 25 99

Image number	Image problem “before”	Image goal “after”	Action done on image”before”	The result of the image
[21]	Blurred Image and because of this some details have disappeared	Fix the blurring in the image so that the details are clear and .visible	Function of **Sharpening**	The image blurred was gone, enhance the edge details and overall sharpness of an image.

[22]

Image number	Image problem “before”	Image goal “after”	Action done on image”before”	The result of the image
[22]	The image has high brightness and blurred so because of this some details have disappeared	Fix the brightness and blurred in the image so that the details are .clear and visible	Function of **Gamma Correction** **&** Function of **Sharpening**	The image brightness and blurred was gone, enhance the edge details and overall sharpness of an image.

[23]

Image number	Image problem “before”	Image goal “after”	Action done on image”before”	The result of the image
[23]	The image was darkeness and because of this some details have disappeared	Fix the darkeness in the image so that the details are clear and .visible	Function of **Gamma Correction** **&** Function of **Sharpening**	The image darkness was gone, enhance the edge details and overall sharpness of an image.

Conclusion

In conclusion, the project focuses on utilizing digital image processing techniques to enhance the quality of facial images. By implementing advanced algorithms and methodologies specifically tailored for facial enhancement, the project aims to improve the clarity, visibility, and overall .quality of facial features in digital images