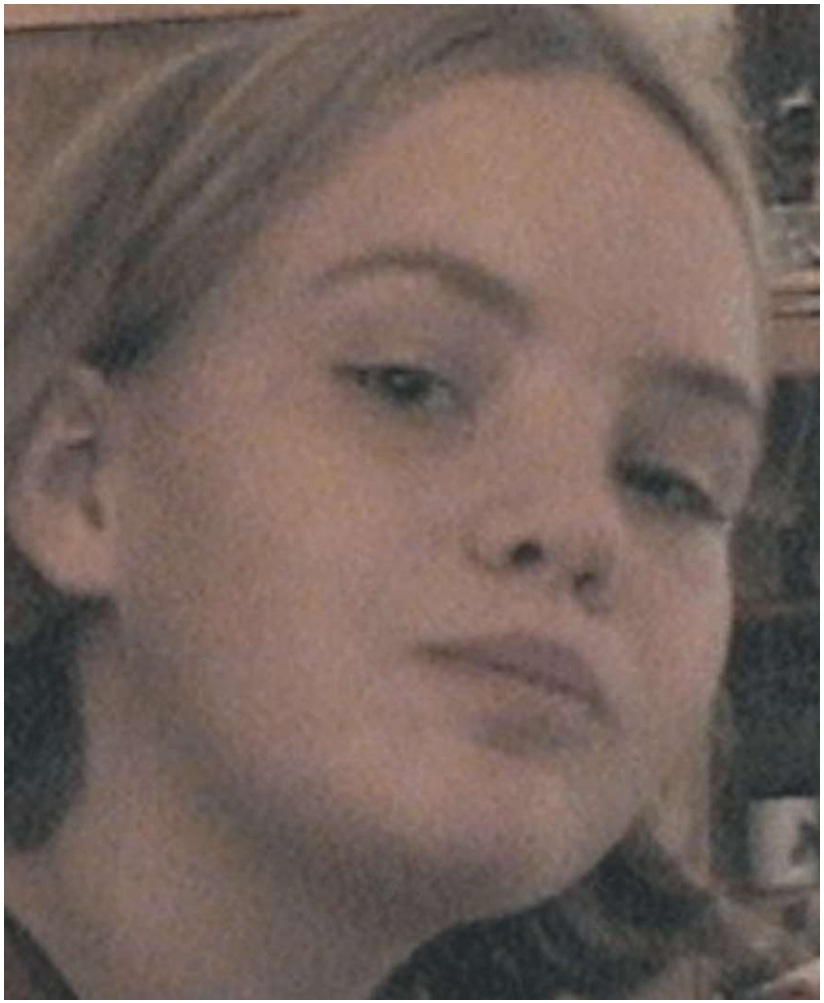
Photo restoration with GFPGAN



Chris Taylor

Members' favourites
September, 2022

Photo restoration with GFPGAN

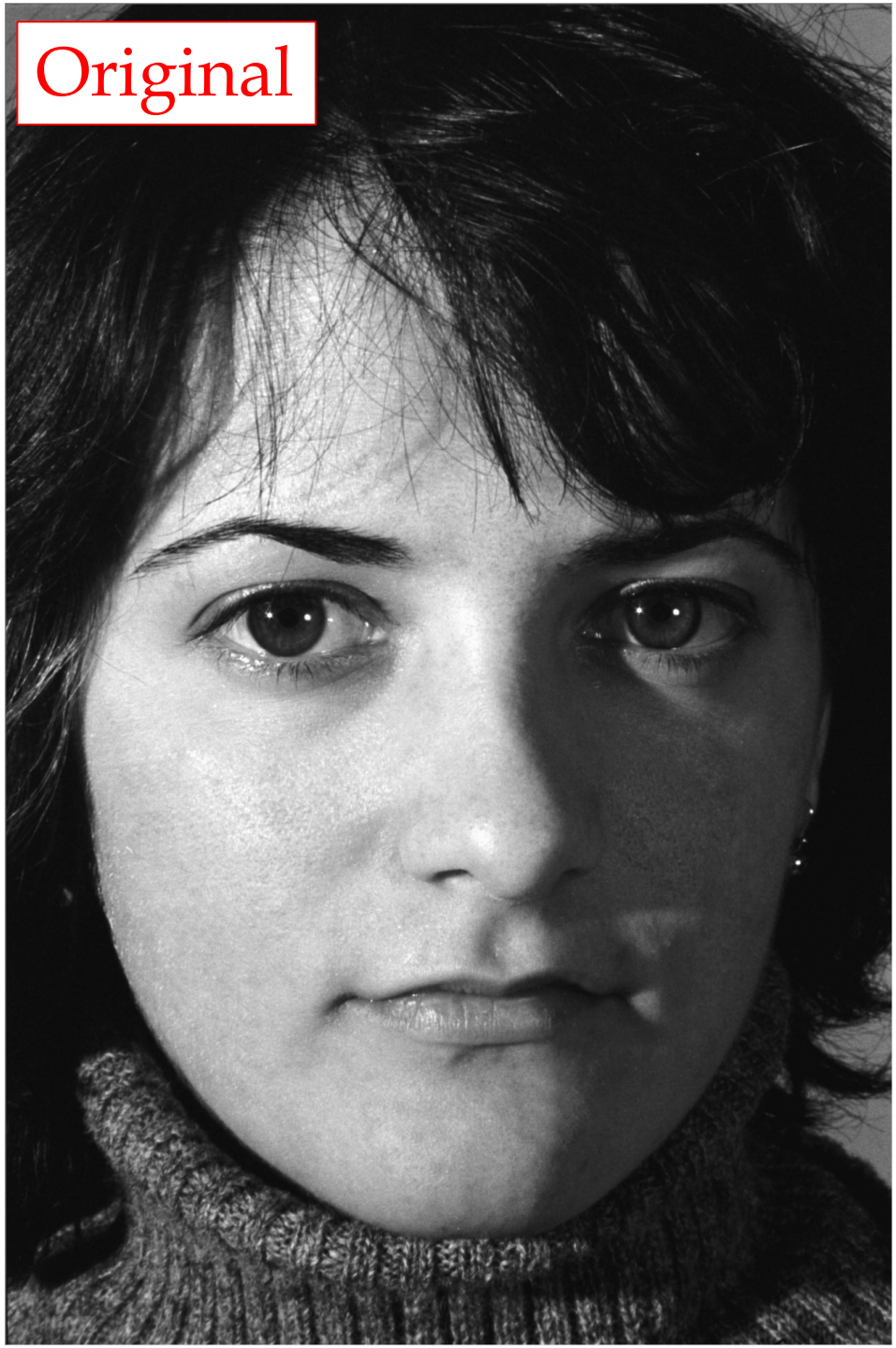
- *Restore old photos using our photo restoration application, built with Baseten and powered by the GFP-GAN model*
- Free web-based utility
- No user control
  - upload image & site does what it does
- Works best on images of people
  - minor improvements to other photos
    - mostly just noise reduction

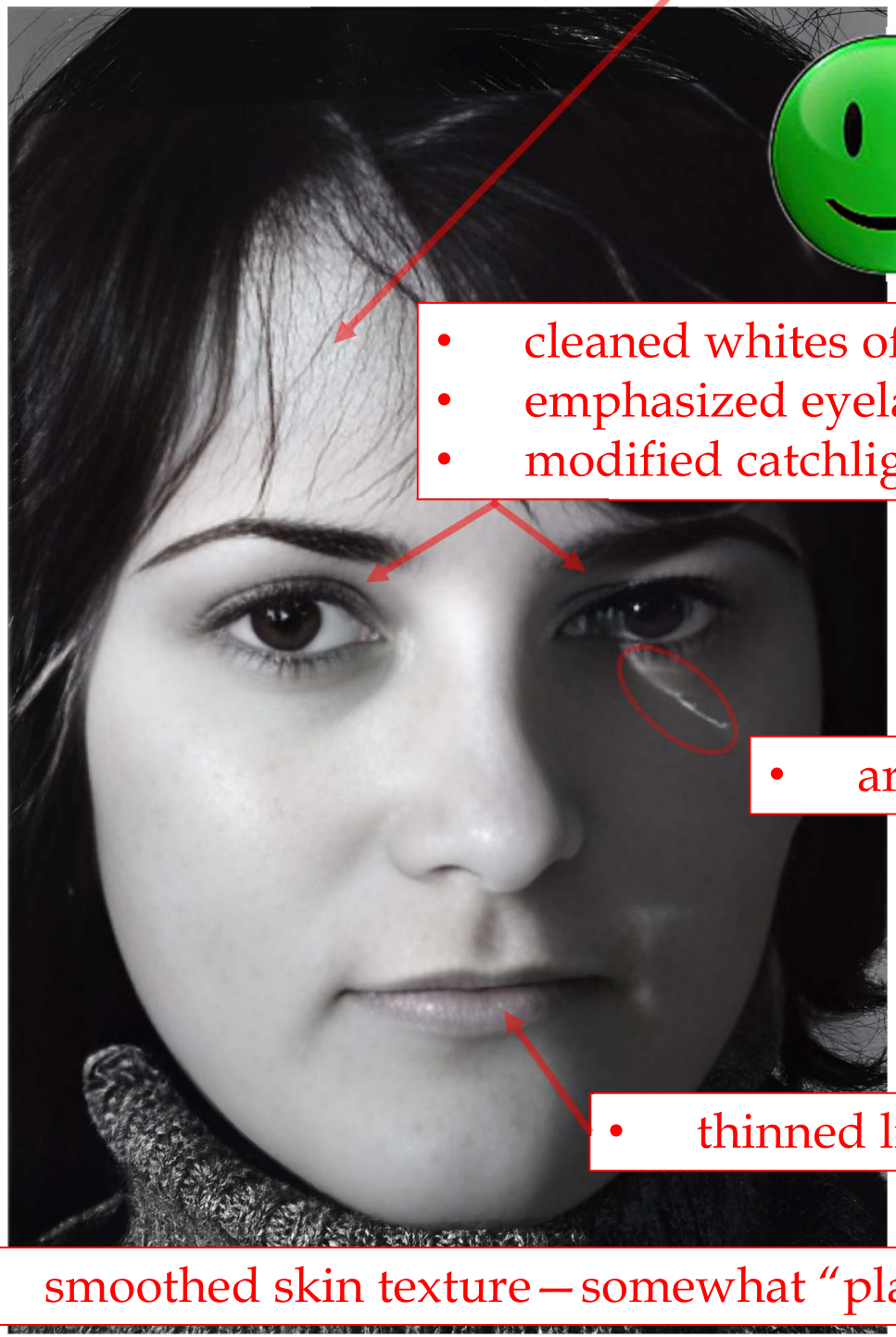
GFPGAN implementation of project
https://app.baseten.co/apps/QPp4nPE/operator_views/RqgOnqV
Full project at Github
https://github.com/TencentARC/GFPGAN

More info:
https://petapixel.com/2022/07/28/gfpgan-is-a-new-free-ai-tool-that-can-fix-most-old-photos-instantly/

Photo restoration with GFPGAN

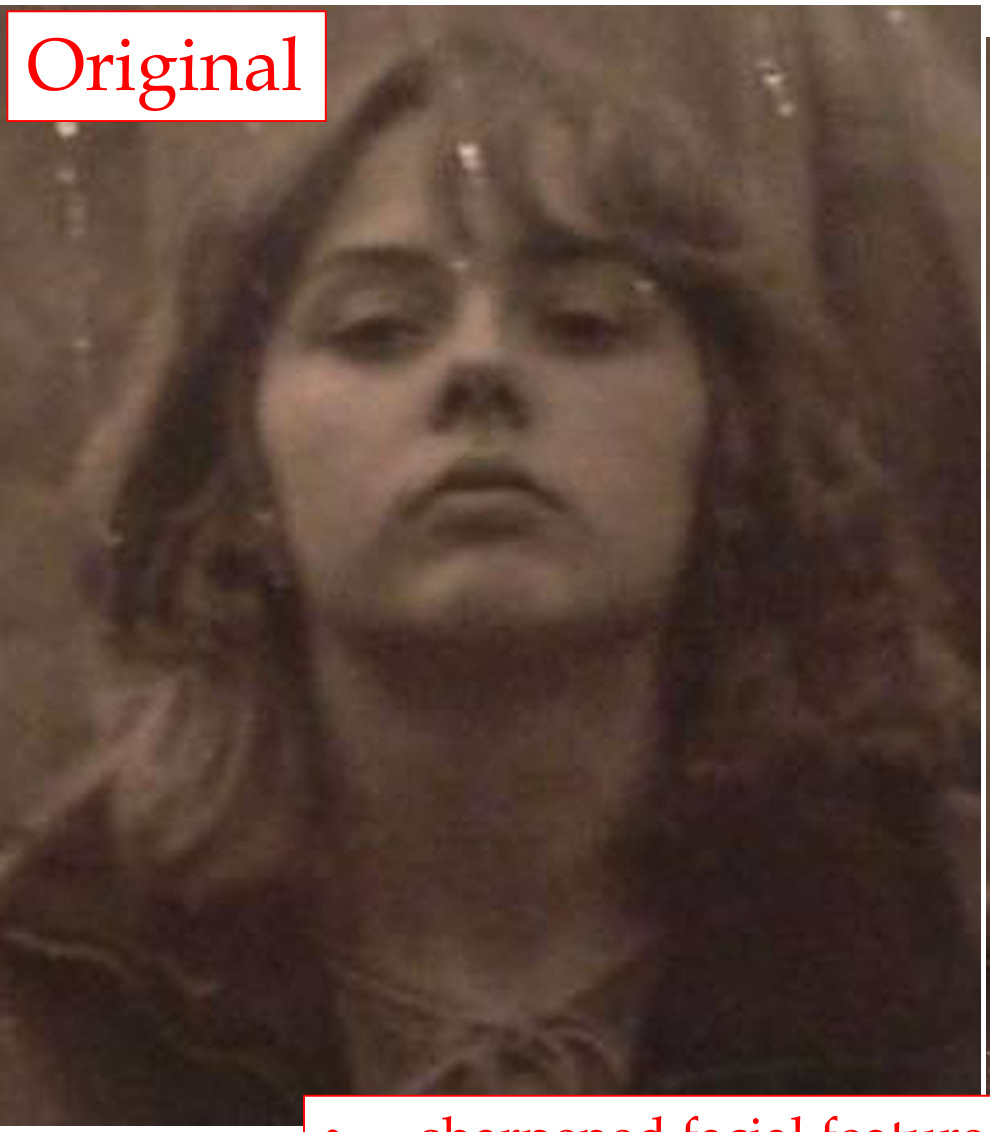
- Common picture file formats supported
  - jpg & tif - most likely formats found
  - also tested with bmp, gif, png, webp
- Huge resolutions supported – tested with
    - 42 megapixel Sony A7R III camera (7,952 x 5,304 pixels)
    - 122 megapixel tif (14,557 x 8,418 pixels)
- No RAW support (common in digital cameras) – I tried
    - Nikon NEF
    - Canon CR2
    - Sony ARW
- Restored image
    - png file
    - max 2,800 pixels (width or height)
    - upscales smaller images up to 2x





- removed some stray hairs
- cleaned whites of eyes
- emphasized eyelashes
- modified catchlights
- artifact
- thinned lips
- smoothed skin texture—somewhat "plastic"

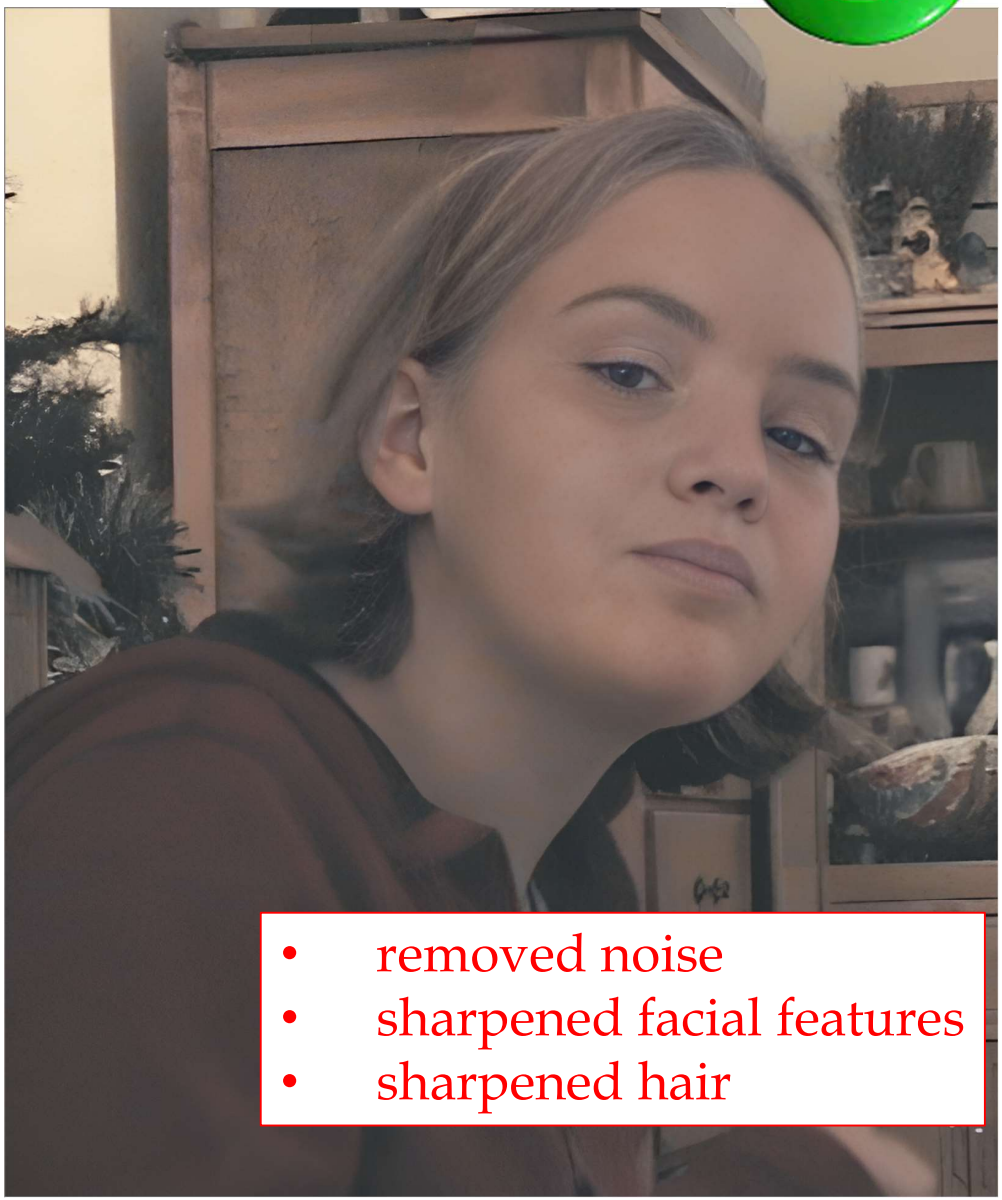
Original



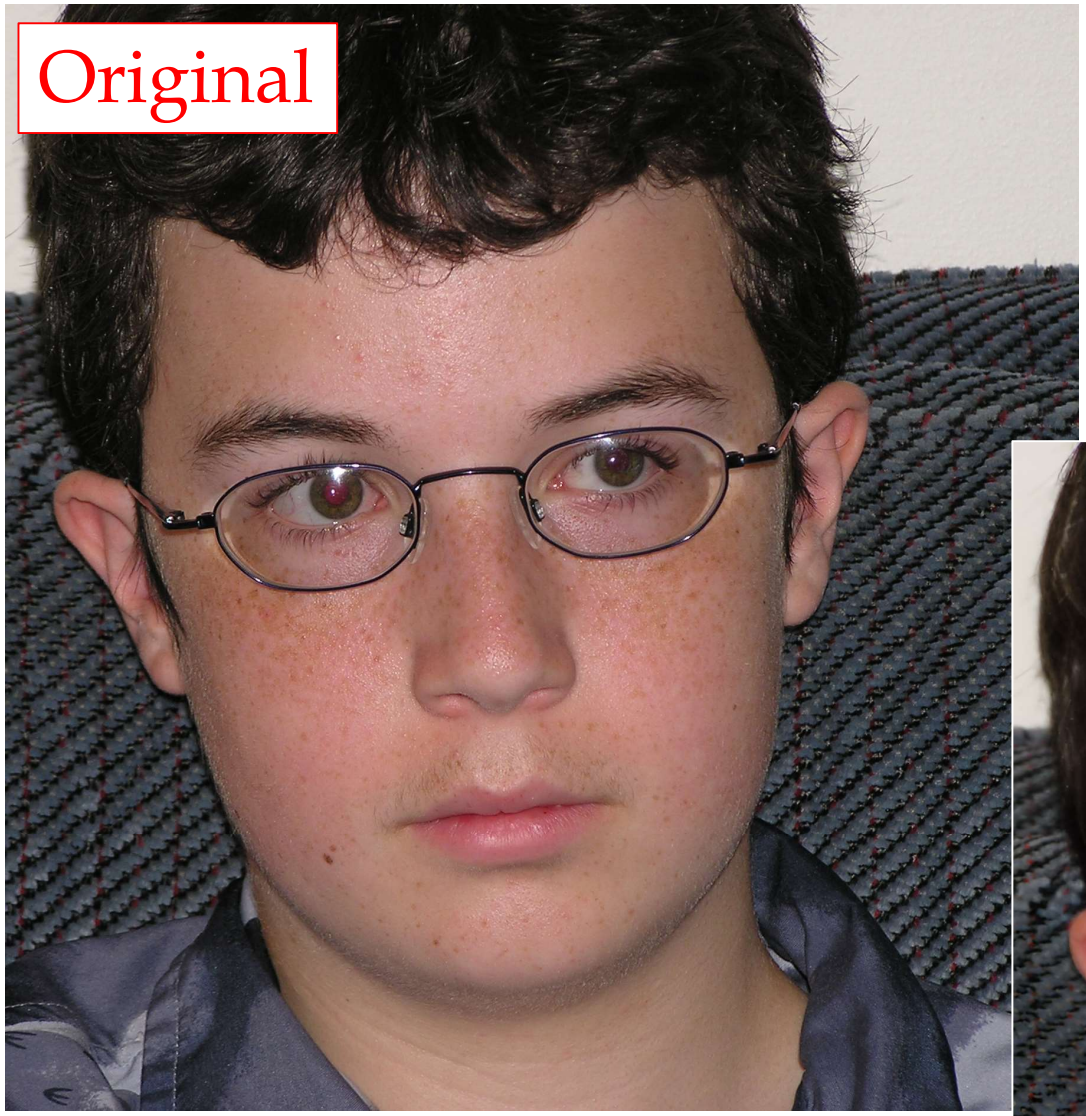
- sharpened facial features
- removed grain
- didn't removed white spots

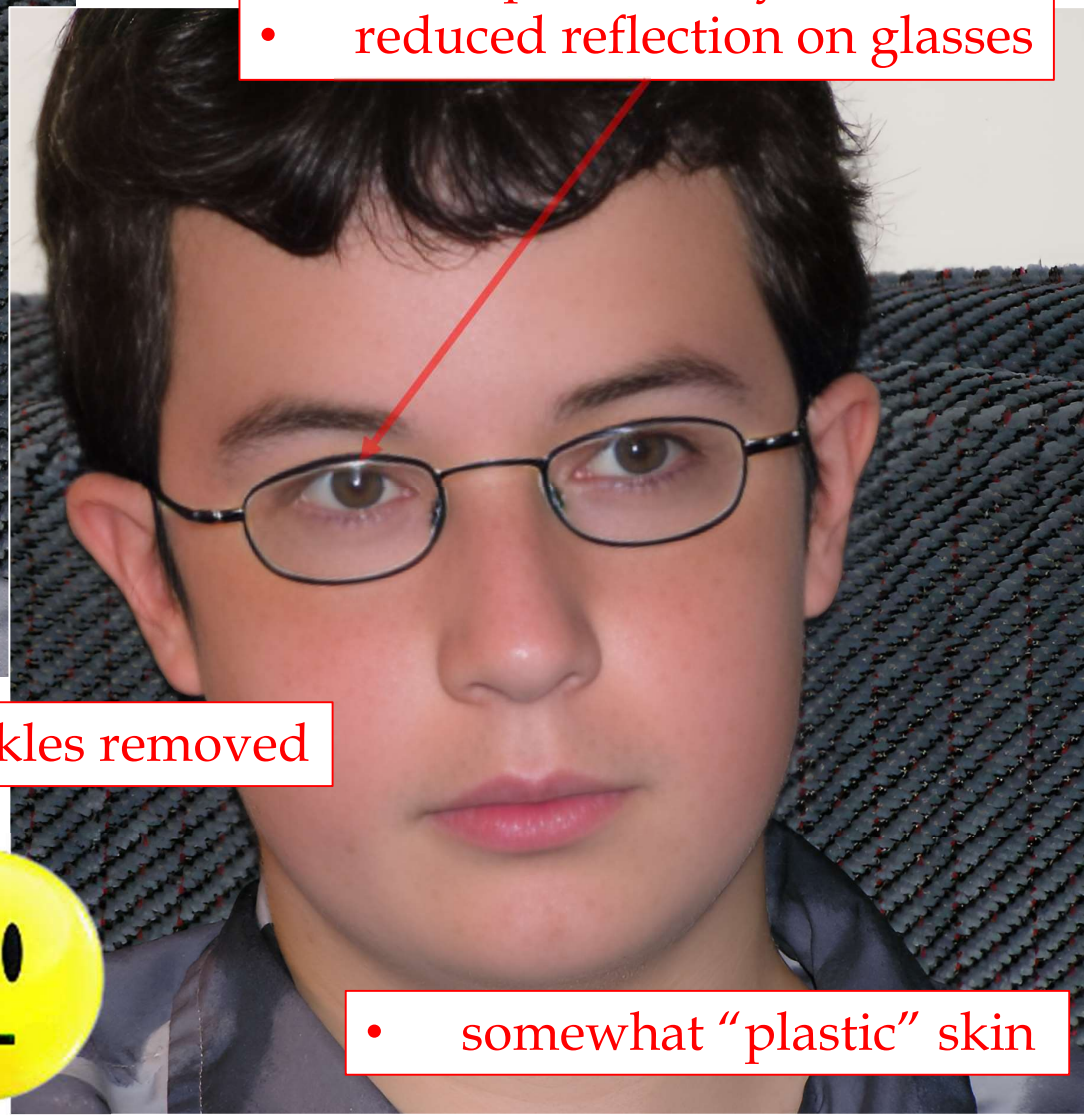
2 minutes editing in ON1 Photo RAW

Original



- removed noise
- sharpened facial features
- sharpened hair



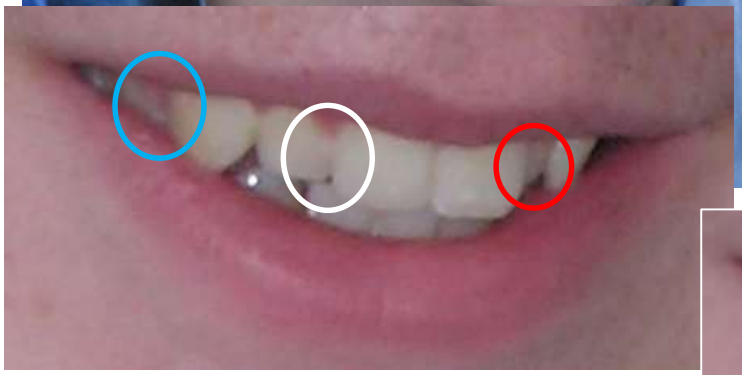


- removed red-eye
- cleaned up whites of eyes
- de-emphasized eyelashes
- reduced reflection on glasses

- freckles removed

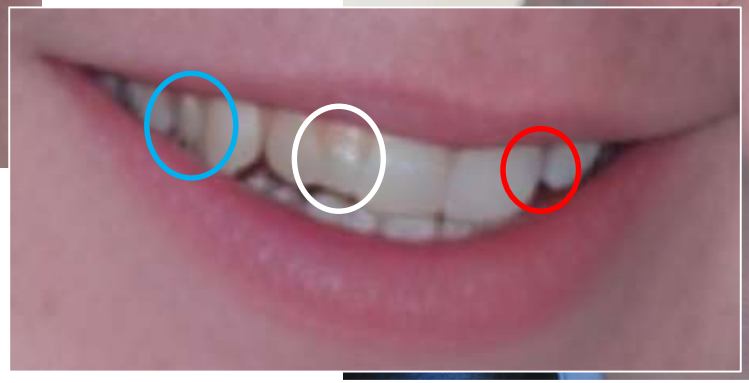
- somewhat “plastic” skin

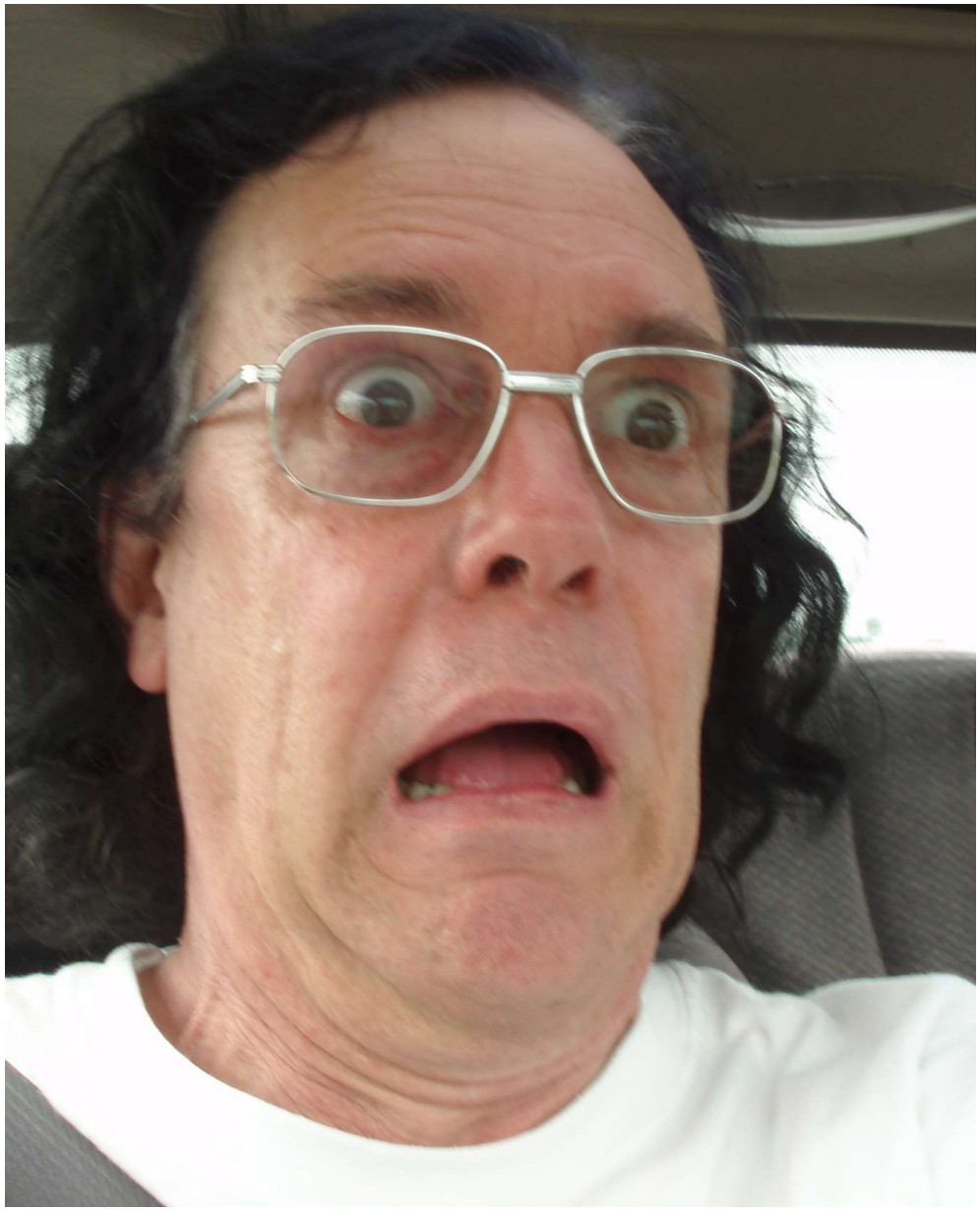
Original



removed upper eyelashes

really changed teeth





- sharpened glasses
- sharpened eyes
- reduced white above irises (**badly**)
- removed some teeth
- smoothed skin—somewhat "plastic"

GFPGAN AI model

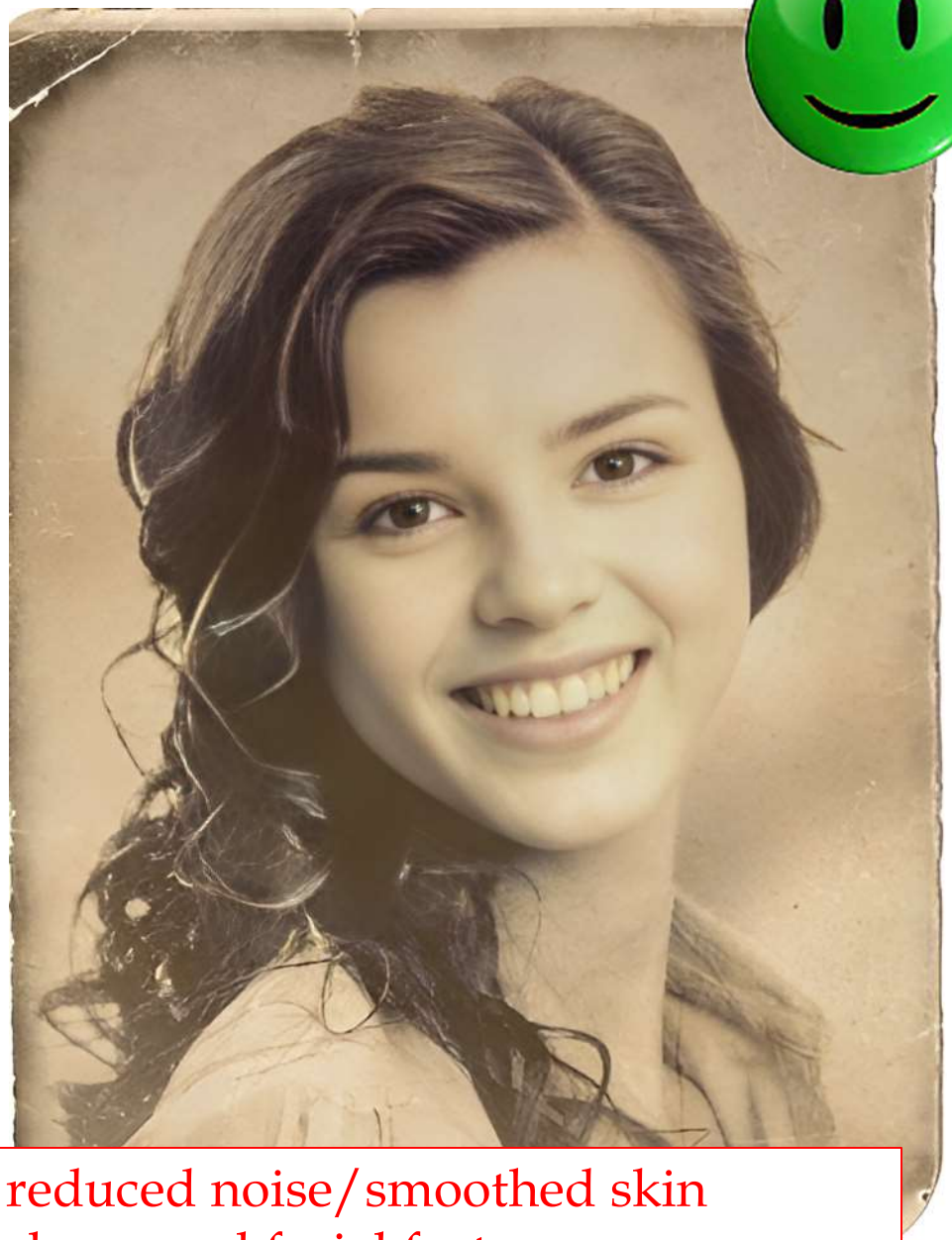
The restored images…do not represent the actual image. …these results are just guesses from the model—guesses that seem pretty damn close.

The AI enhances facial details, focusing on important local features like a person's eyes, mouth, and nose.

The system then compares the real image to the newly restored image to see if they still have the same person in the generated photo

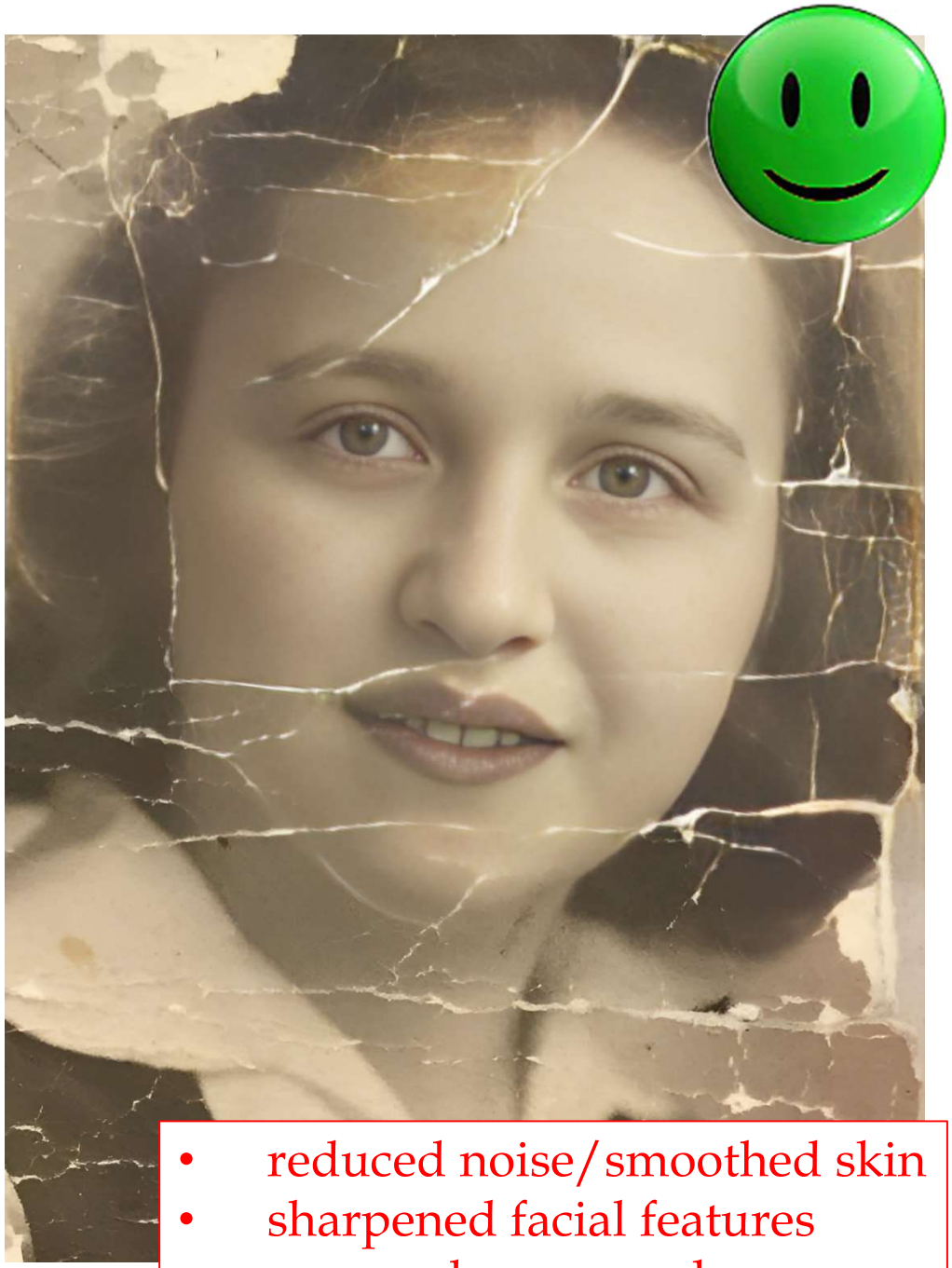
restored images…can have a "slight change of identity"

Original



- reduced noise/smoothed skin
- sharpened facial features
  - eyes/eyebrows/teeth/lips/nose
- changed catchlight in eyes

Original

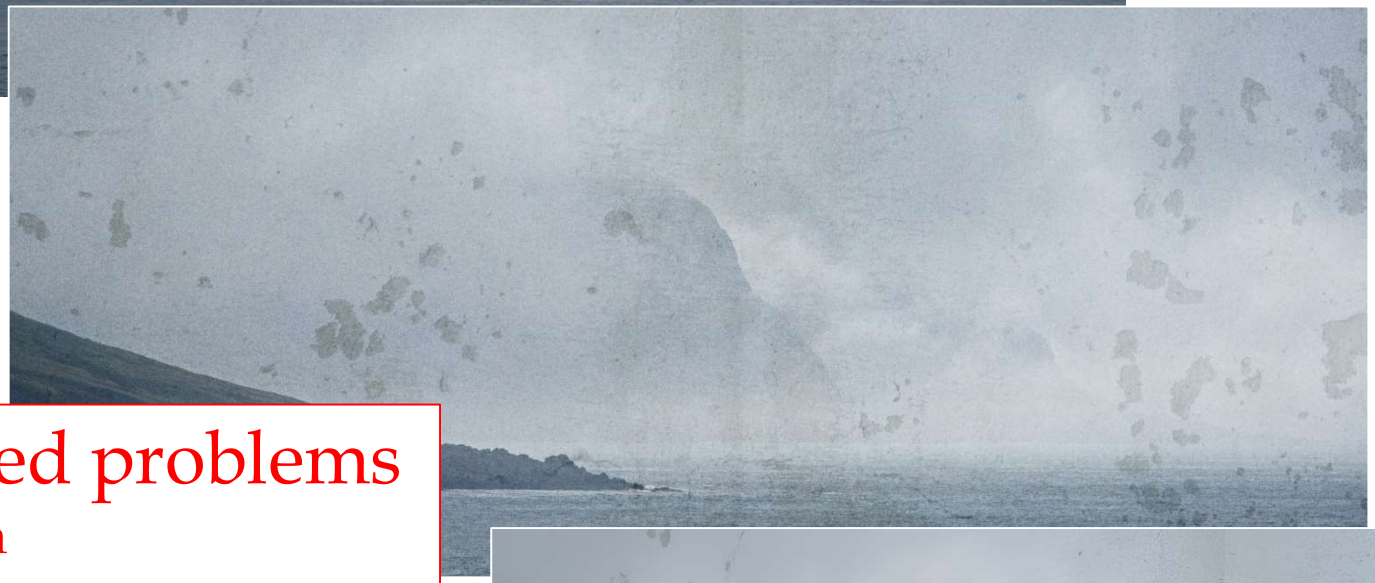


- reduced noise/smoothed skin
- sharpened facial features
- removed some cracks
- smudged stain on forehead
- changed catchlight in eyes

Original

- smoothed & lightened background slightly

Original



I created problems

- grain
- texture
- vertical fold

GFP-GAN processed

- reduced grain
- softened texture & fold slightly

Overall conclusions

- Highly tuned to faces
  - smooths skin
    - more than I would prefer
  - sharpens features
  - generally does very good job
- Reduces digital noise
- Does little else to improve non-people images
- Free—why not give it a try?

GFPGAN implementation of project
https://app.baseten.co/apps/QPp4nPE/operator_views/RqgOnqV
Full project at Github
https://github.com/TencentARC/GFPGAN

More info:
https://petapixel.com/2022/07/28/gfpgan-is-a-new-free-ai-tool-that-can-fix-most-old-photos-instantly/