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DEPARTMENT OF JUSTICE
FEDERAL BUREAU OF INVESTIGATION
FIDELITY
BRAVERY
INTEGRITY


DEPARTMENT OF JUSTICE
FEDERAL BUREAU OF INVESTIGATION
CRIMINAL JUSTICE INFORMATION SERVICES DIVISION
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FEDERAL BUREAU OF INVESTIGATION
CRIMINAL JUSTICE INFORMATION SERVICES DIVISION
NEXT GENERATION IDENTIFICATION
NGI

Next Generation Identification

Implementing the future of identification & investigative services

- Rap Back
- Rapid Mobile ID
- Iris
- Facial
- Latents
- Palms

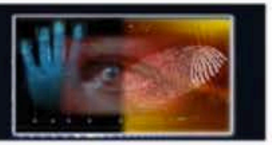
Implementing the future of identification & investigative services

NGI Face Pilot

Face matching system – Currently Available

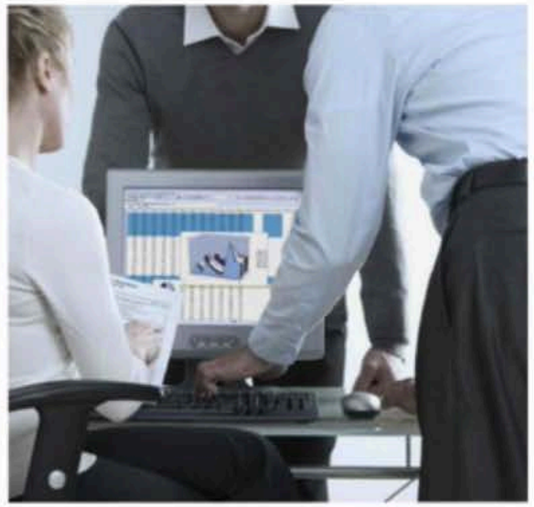
- 12 million Local/State/Federal searchable photos
- Focus on contributor image quality

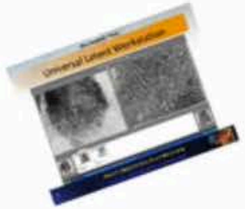
Universal Facial Workstation software



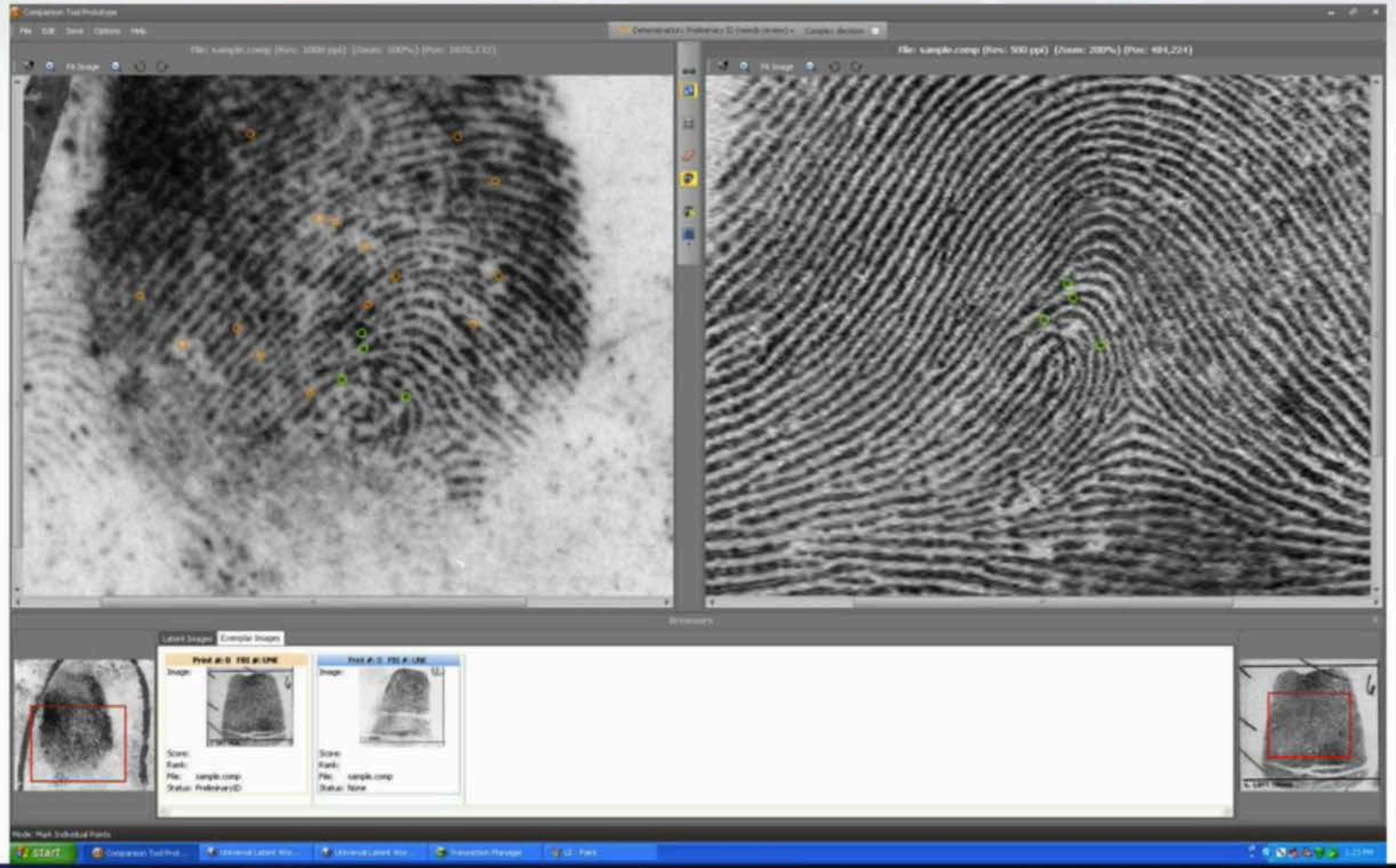
Universal Latent Workstation

ULW Software

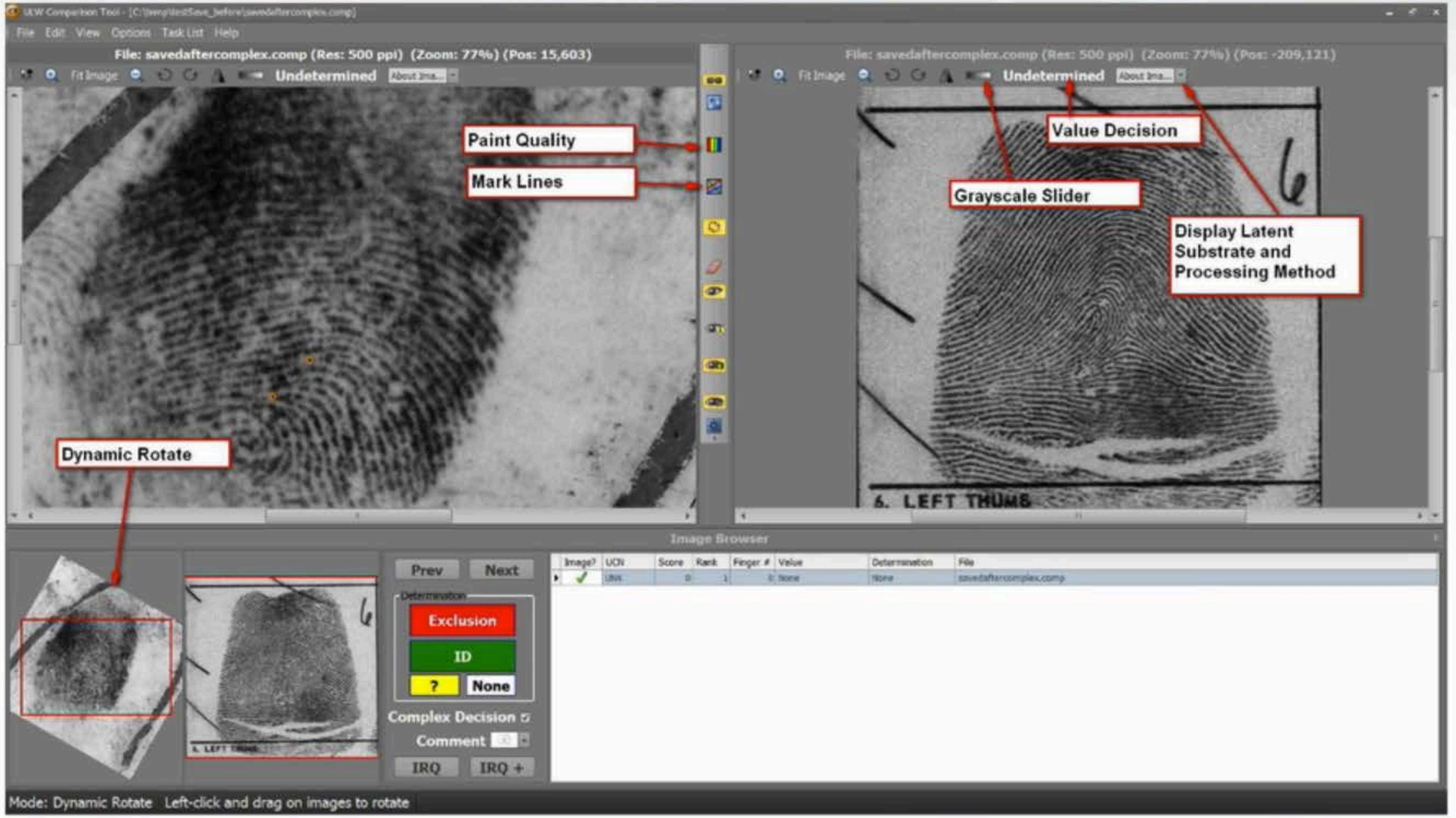




Universal Latent Workstation



ULW Comparison Tool



ULW Comparison Tool

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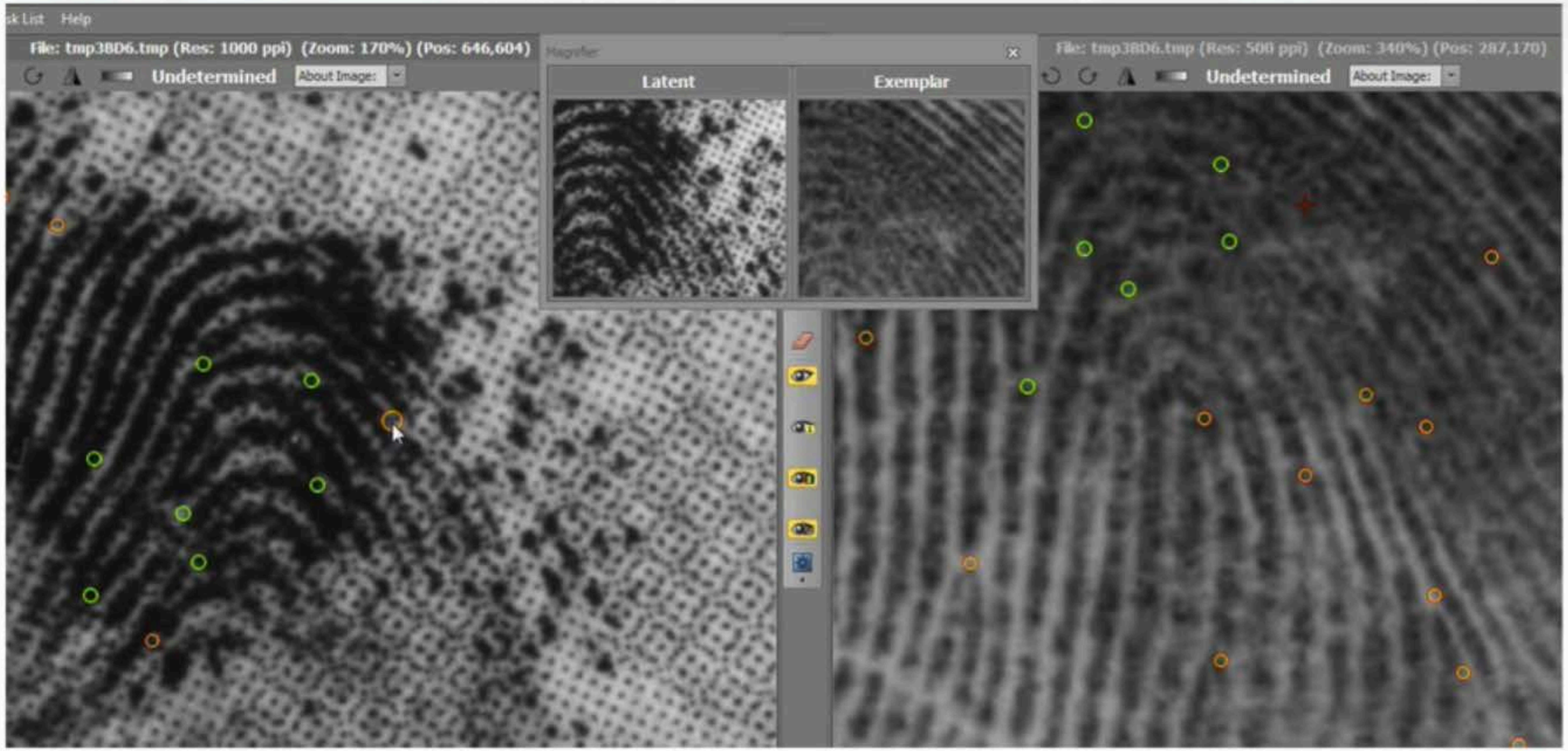
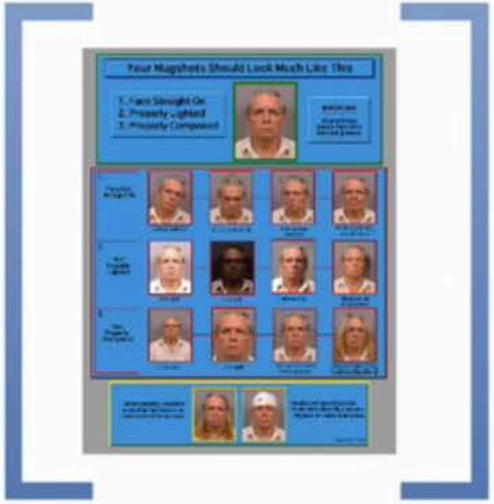
ULW Ghost Cursor



Face Quality



Face Quality Metrics

- Facial Recognition improved through best practices to system contributors
  - Educate the user community on those best practices today
- FBI Face Report Cards
  - Feedback on photo quality and recommendations for better photo capture will be provided upon request
  - Two step image quality review
    - Using quality assessment tools (leveraging from federal partners, private industry, in-house developed)
    - Trained examiner review
- Working to adapt to higher Subject Acquisition Profile (SAP) requirements in user operations (driving better capture technology)

Your Mugshots Should Look Much Like This

1. Face Straight On
2. Properly Lighted
3. Properly Composed

IMPORTANT

Your primary photo should be without glasses.

1. Face Not Straight On


Side to side tilt


Front to back tilt


Side to side rotation


Smile or grimace, mouth open

2. Not Properly Lighted


Too light


Too dark


Unevenly lit


Shadows on background

3. Not Properly Composed


Too loose


Too tight


Texture or objects in background


Obstructions to face

When possible, long hair should be tied back or at least tucked behind ears.

Head coverings should be removed unless they serve a religious or medical purpose.

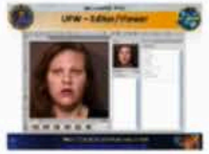
Revised 12/12/12

Universal Facial Workstation

UFW Software

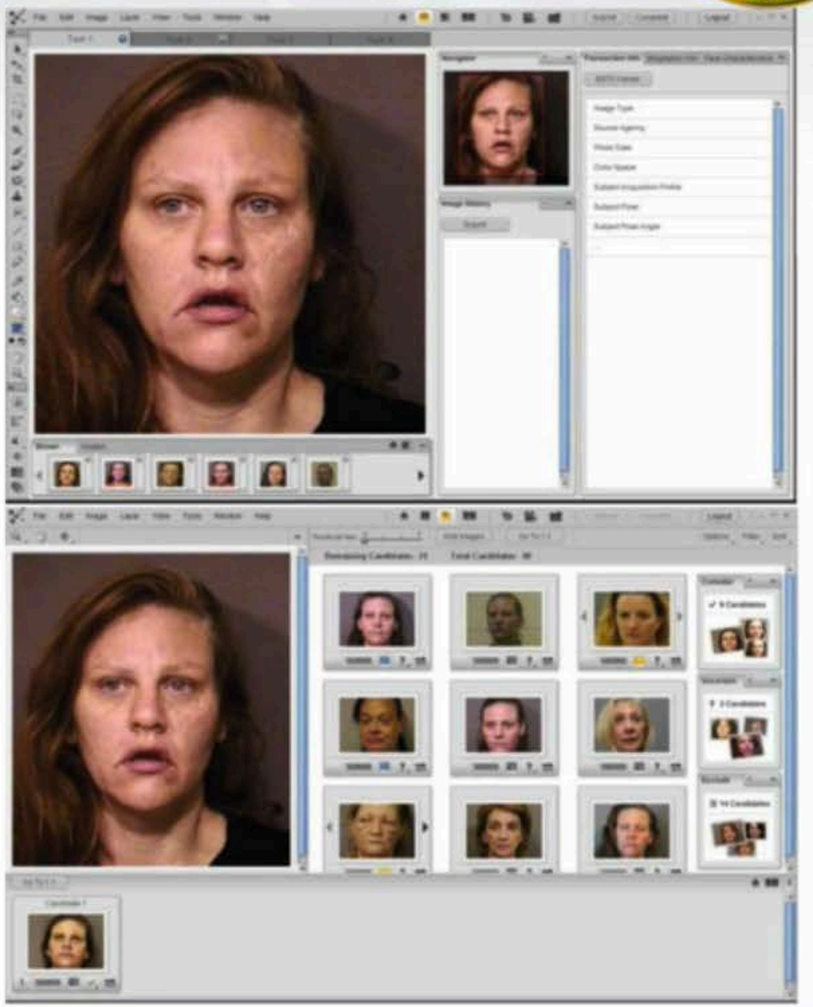







Universal Face Workstation (UFW)

- FBI user software to support access to NGI Face Pilot and NGI System face search capabilities
- Cross Platform (Windows, OSX, Linux)
- Built upon a Biometric Integration Platform
- Built on open source frameworks
- Extensive support for plugins
- Will be available for Law Enforcement use free of charge



UFW Objectives

- Plan, design, prototype and demonstrate a face workstation which can be freely deployed by the FBI
- Develop services which can be carried over to NGI for biometric processing
- Employ a user experience design philosophy to develop UFW specifically for face examiners
- Permit examiners to:
  - Ingest, analyze and enhance images
  - Select sub-frames or sub-images areas for further analysis
  - Submit files to local and remote matching systems
  - Review, store and match search results

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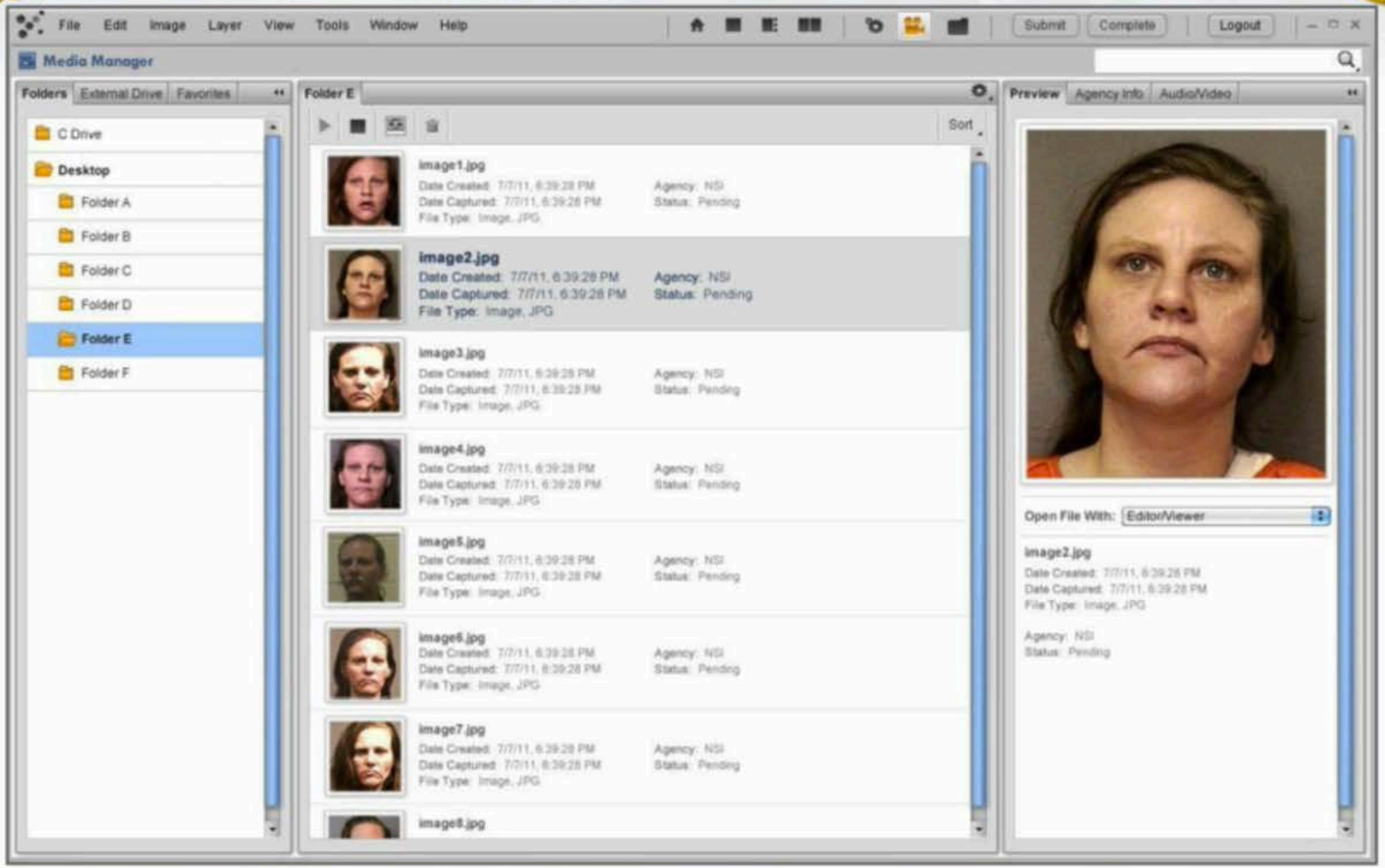
UFW – Media Manager



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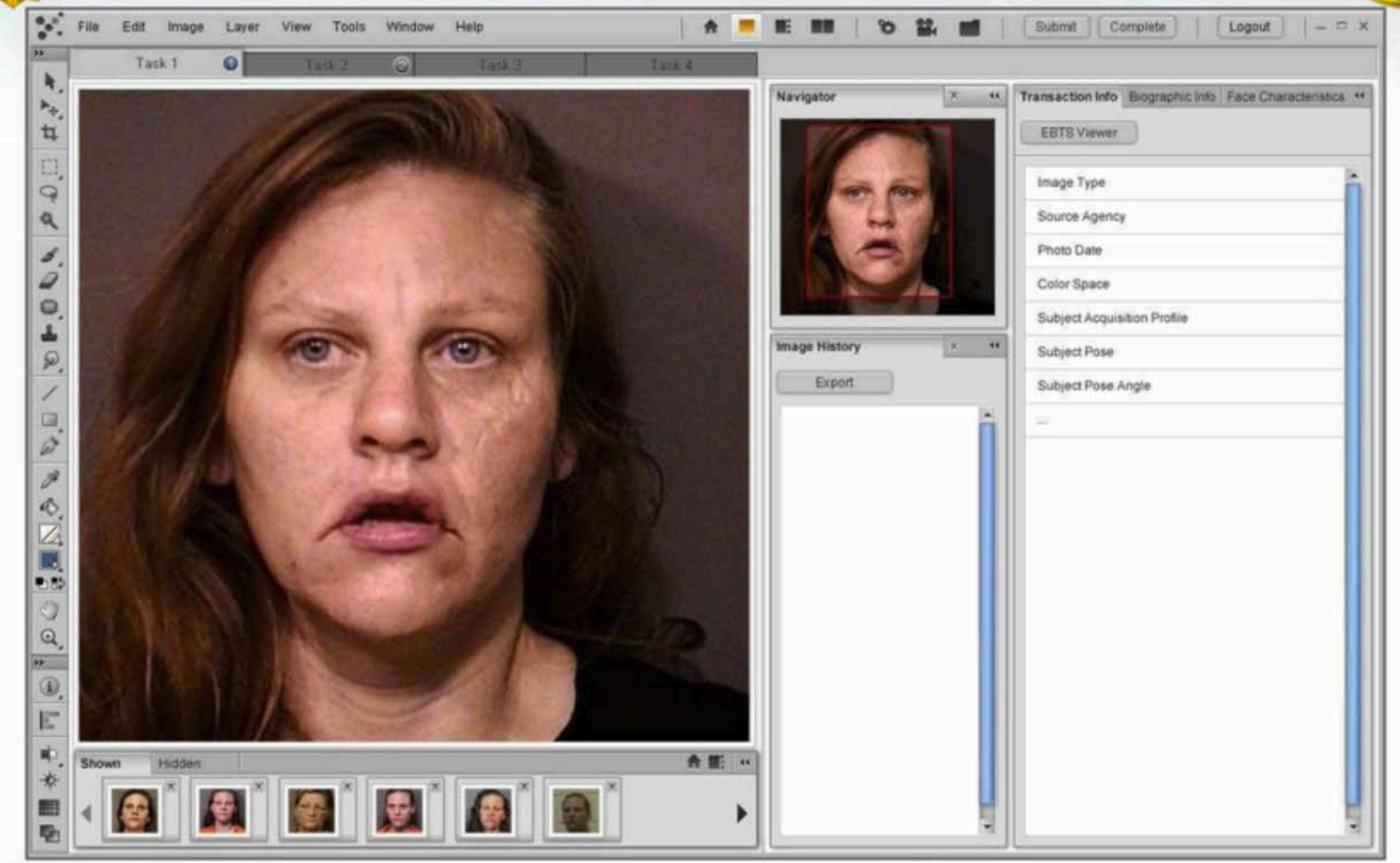
UFW – Editor/Viewer



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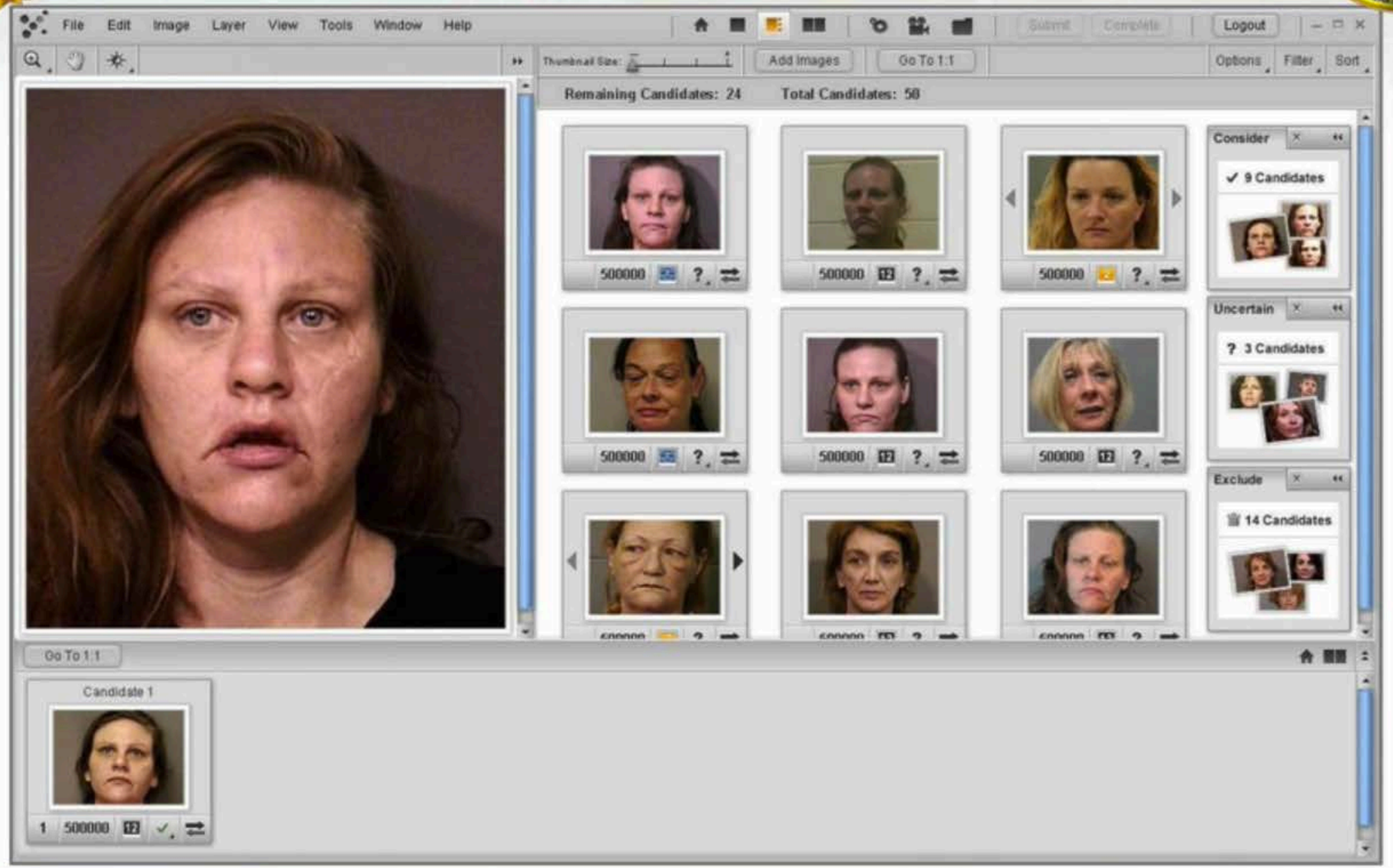
UFW – 1:Many Comparison



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UFW – 1:1 Comparison

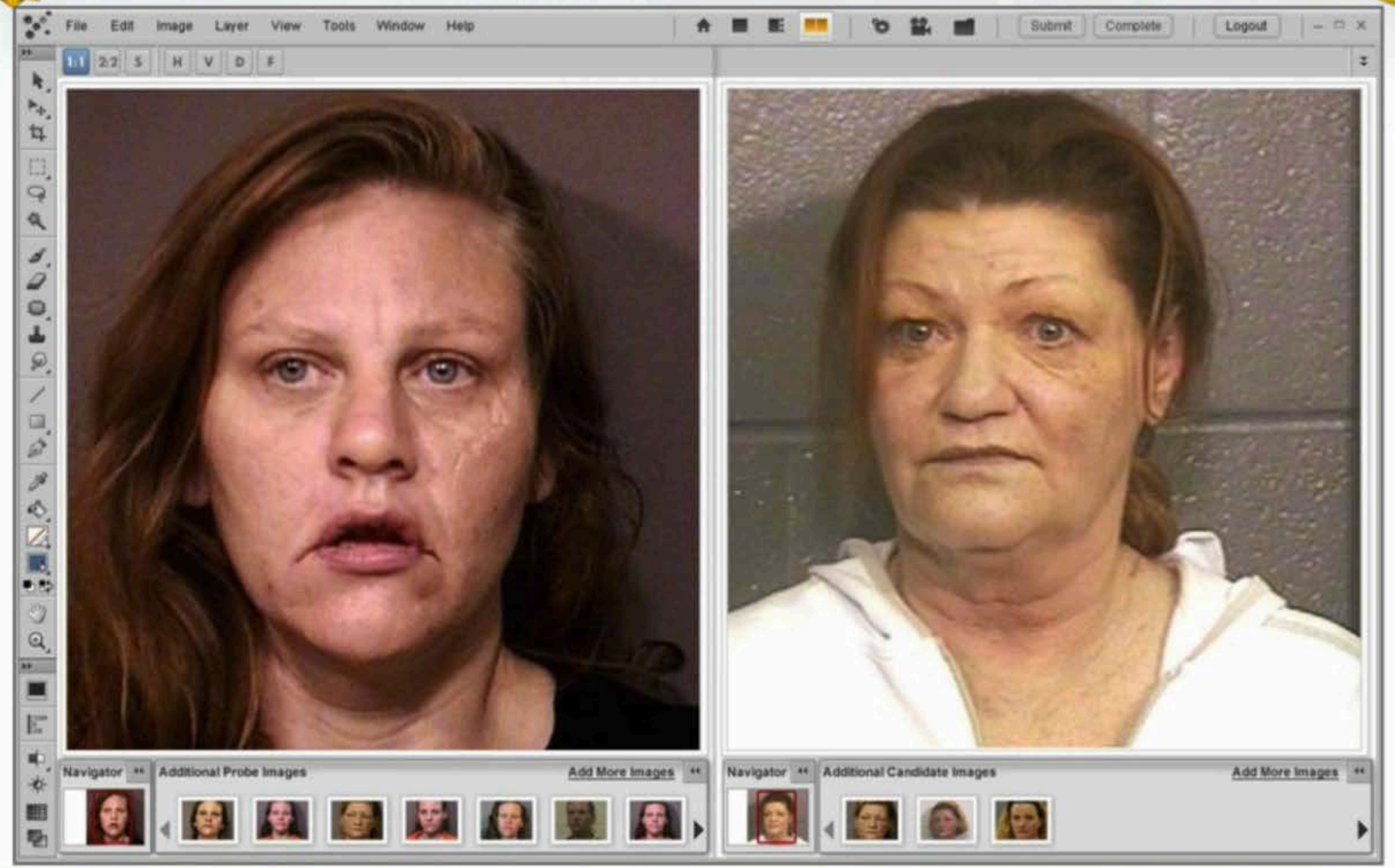

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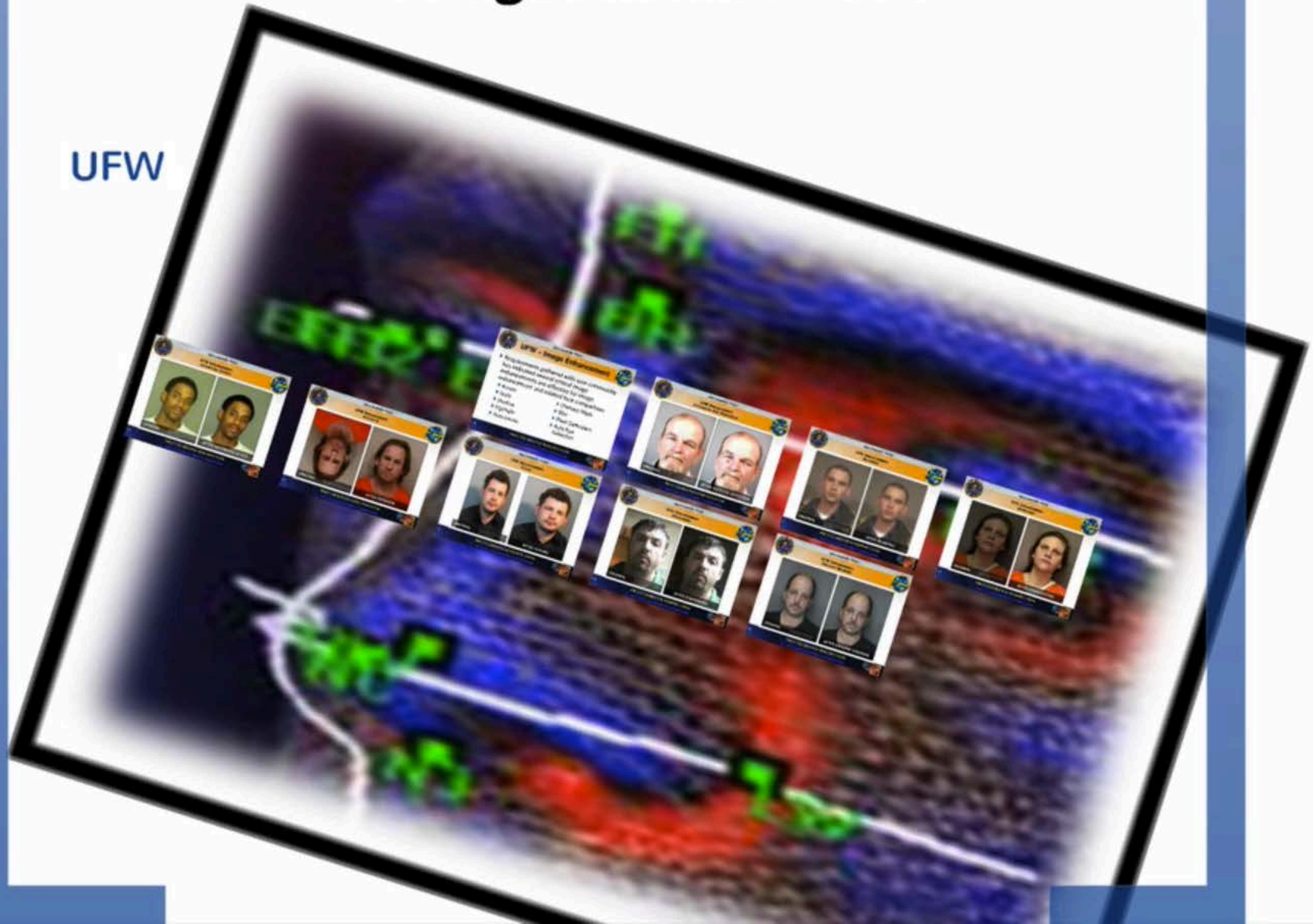
Image Enhancement

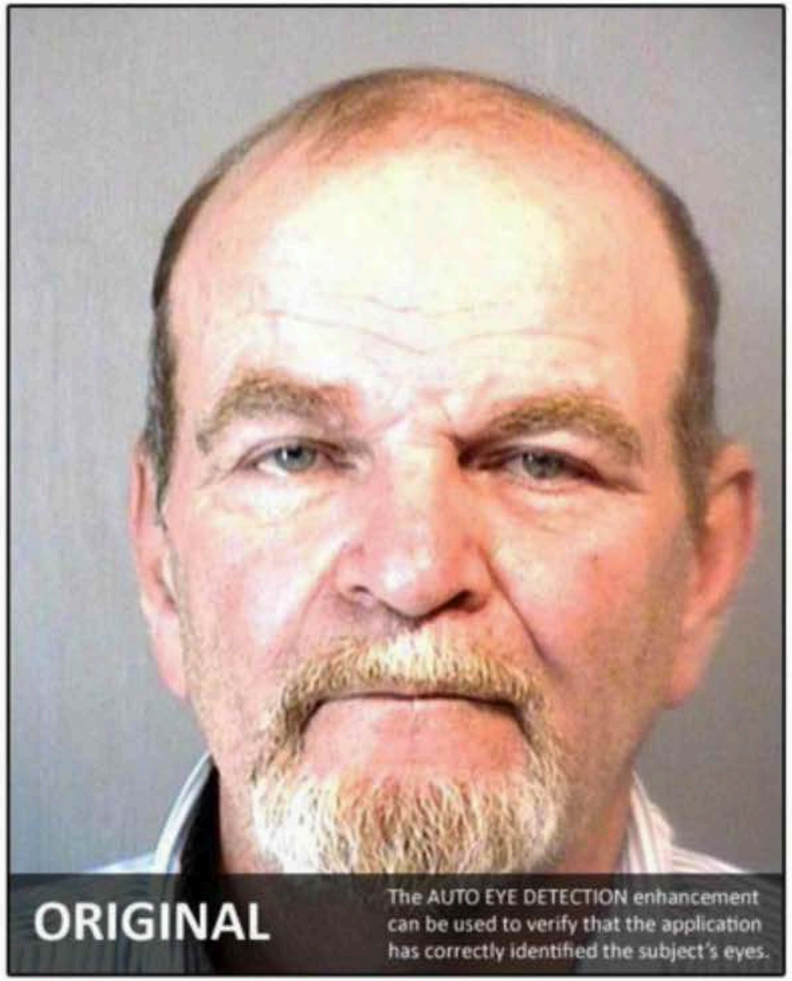
UFW

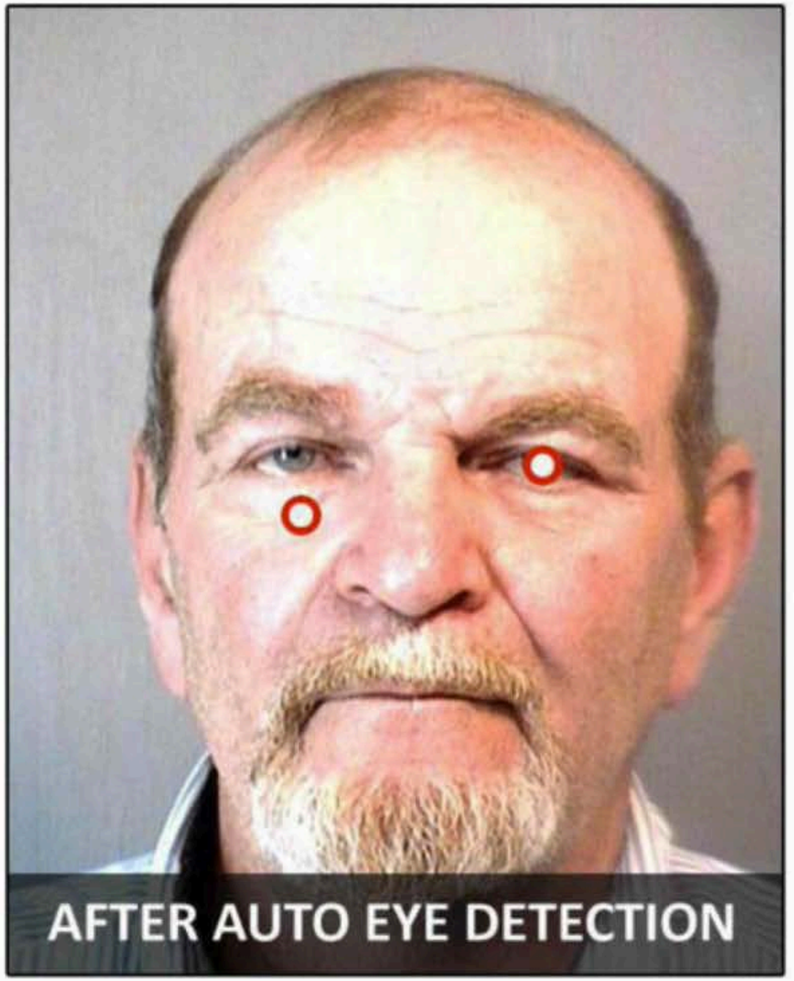


UFW – Image Enhancement

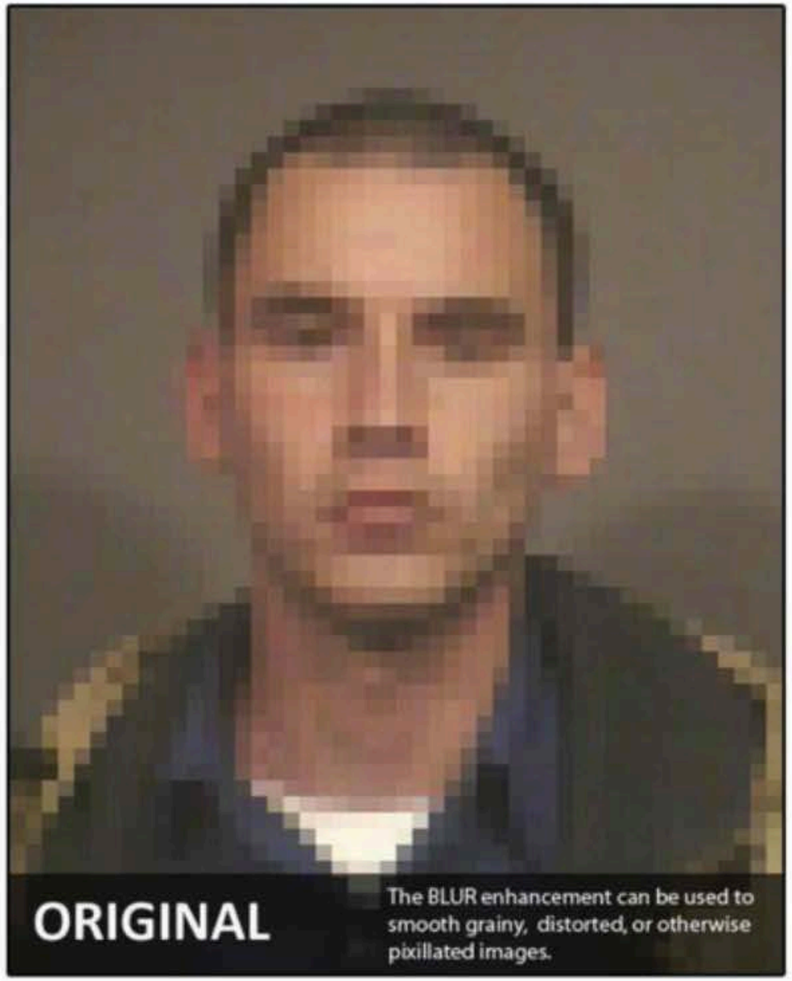
- Requirements gathered with user community has indicated several critical image enhancements are effective for image enhancement and related face comparison.
  - Rotate
  - Scale
  - Shadow
  - Highlight
  - Auto Levels
  - Unsharp Mask
  - Blur
  - Pixel Calibration
  - Auto Eye Detection

UFW Enhancement: Automatic Eye Detection



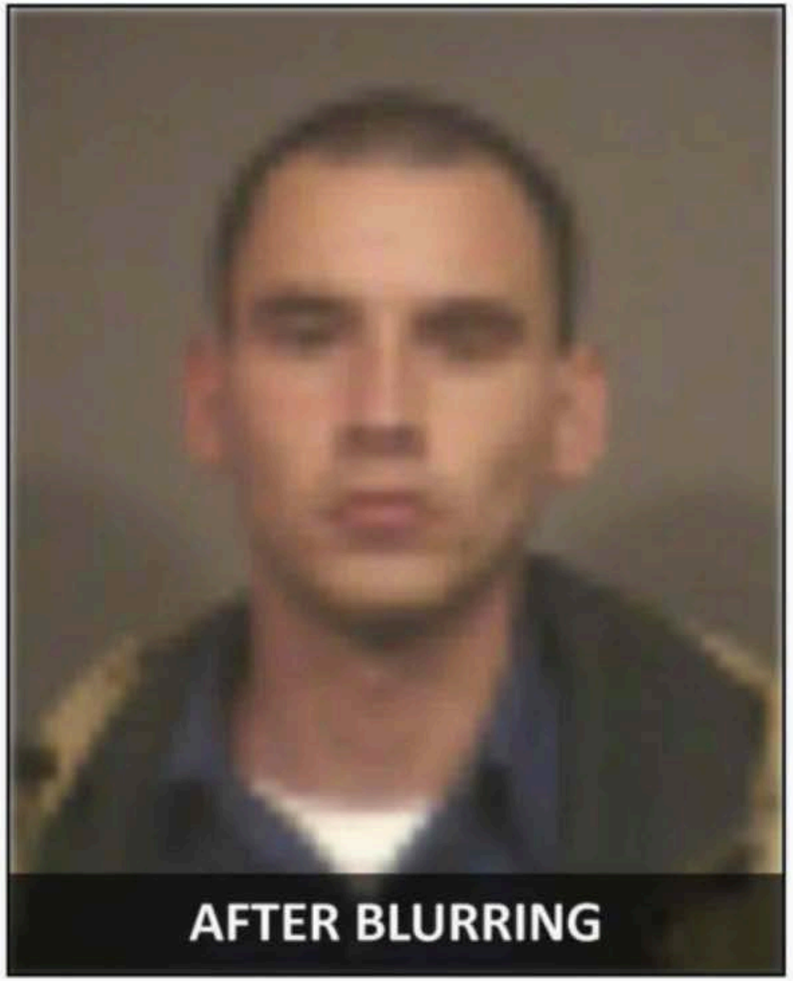


UFW Enhancement: Blurring



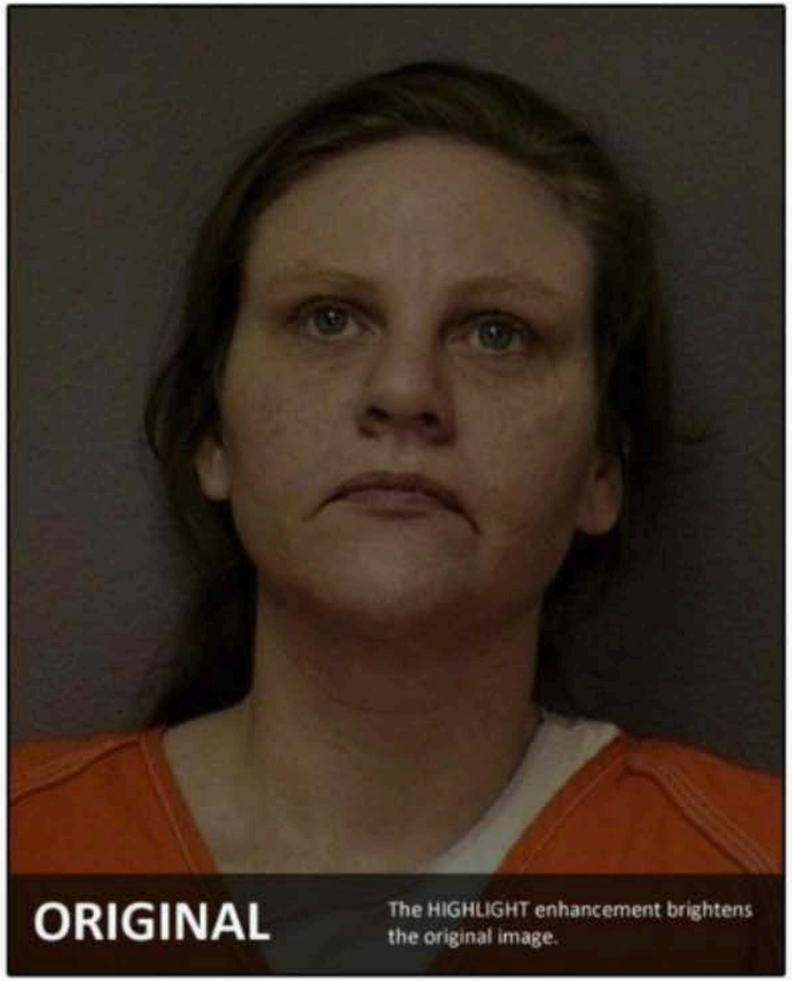
ORIGINAL

The BLUR enhancement can be used to smooth grainy, distorted, or otherwise pixillated images.



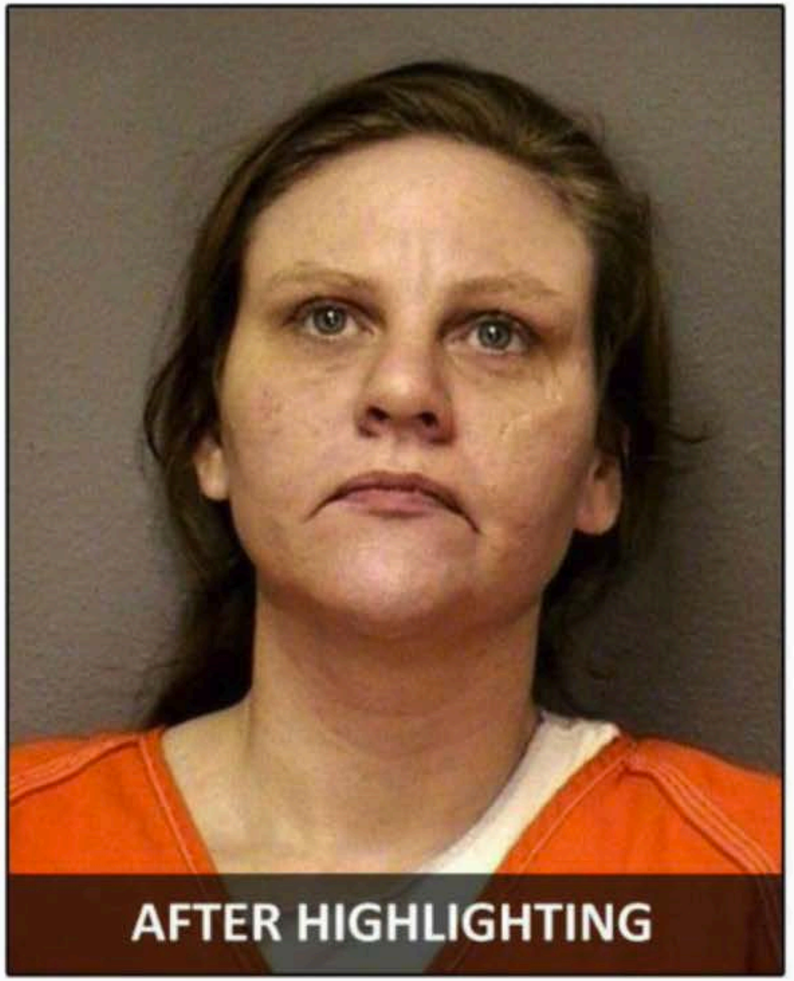
AFTER BLURRING

UFW Enhancement: Highlight



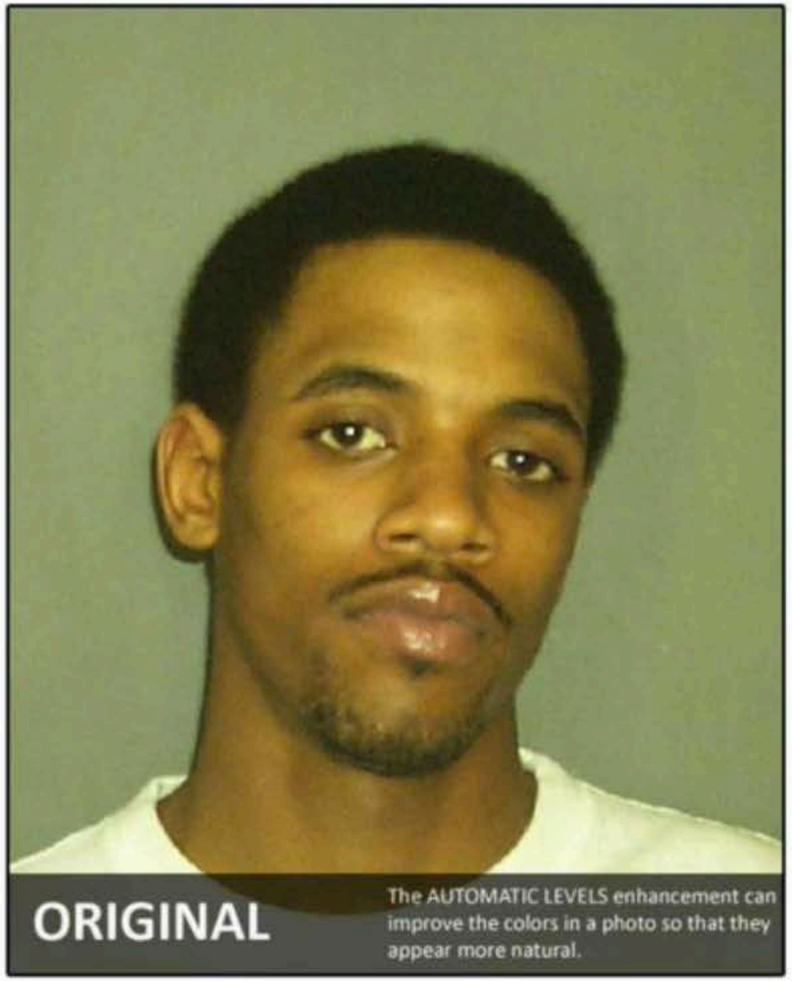
ORIGINAL

The HIGHLIGHT enhancement brightens the original image.



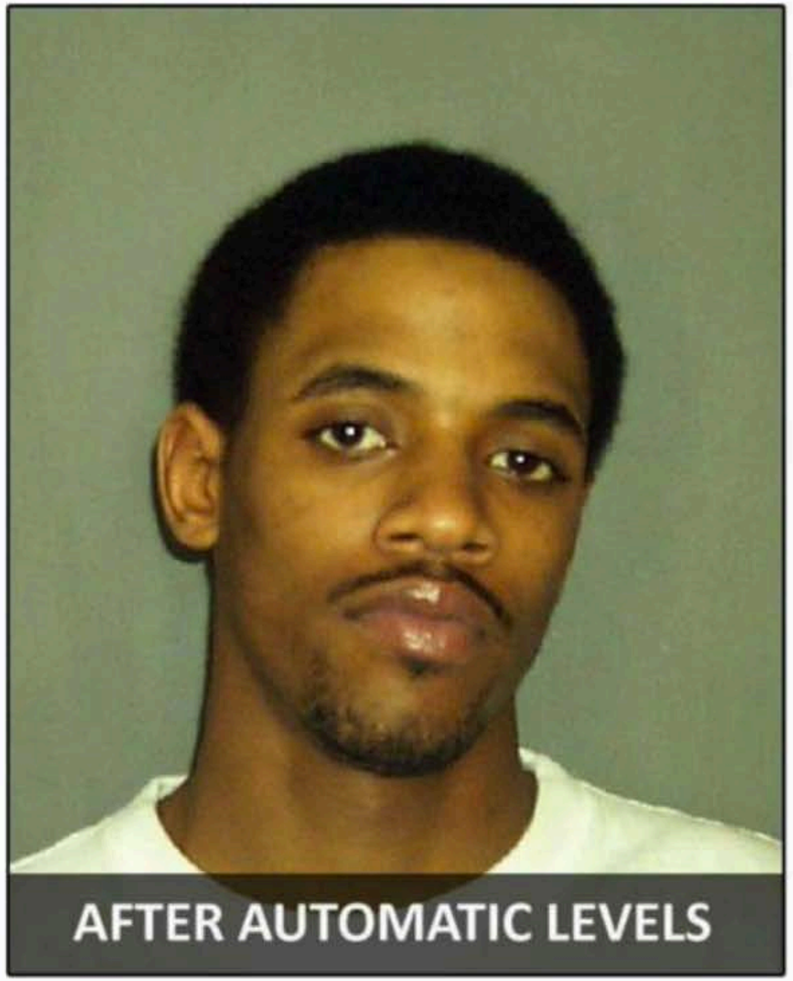
AFTER HIGHLIGHTING

UFW Enhancement: Automatic Levels



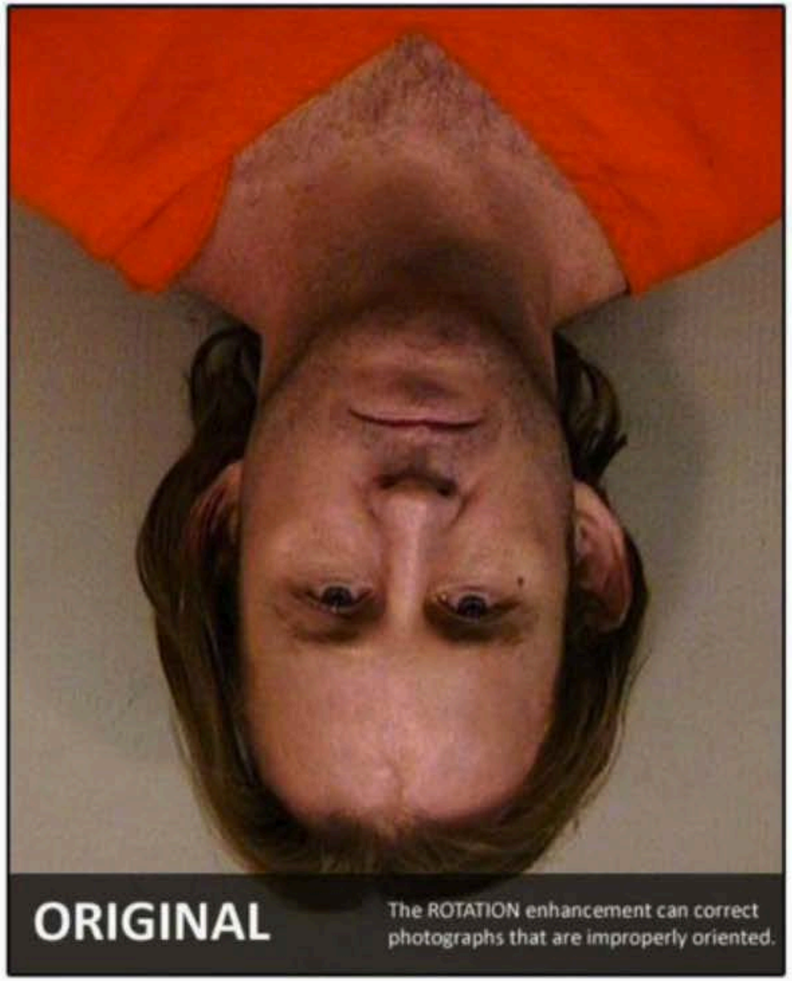
ORIGINAL

The AUTOMATIC LEVELS enhancement can improve the colors in a photo so that they appear more natural.



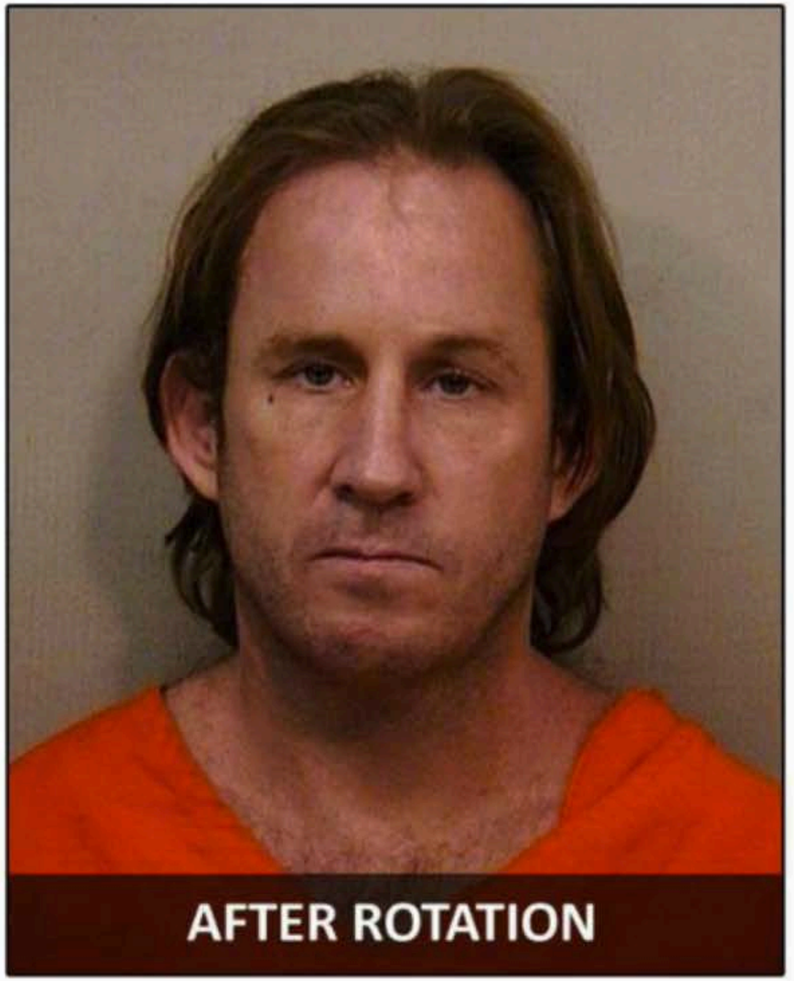
AFTER AUTOMATIC LEVELS

UFW Enhancement: Rotation



ORIGINAL

The ROTATION enhancement can correct photographs that are improperly oriented.



AFTER ROTATION

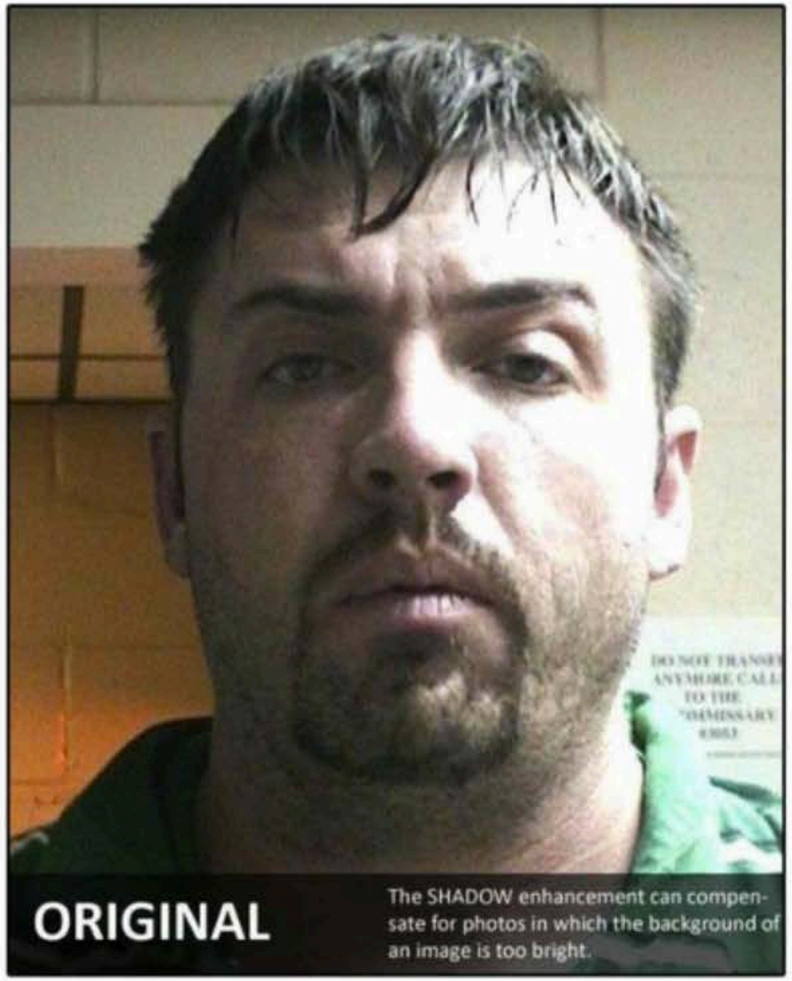
UFW Enhancement: Scale

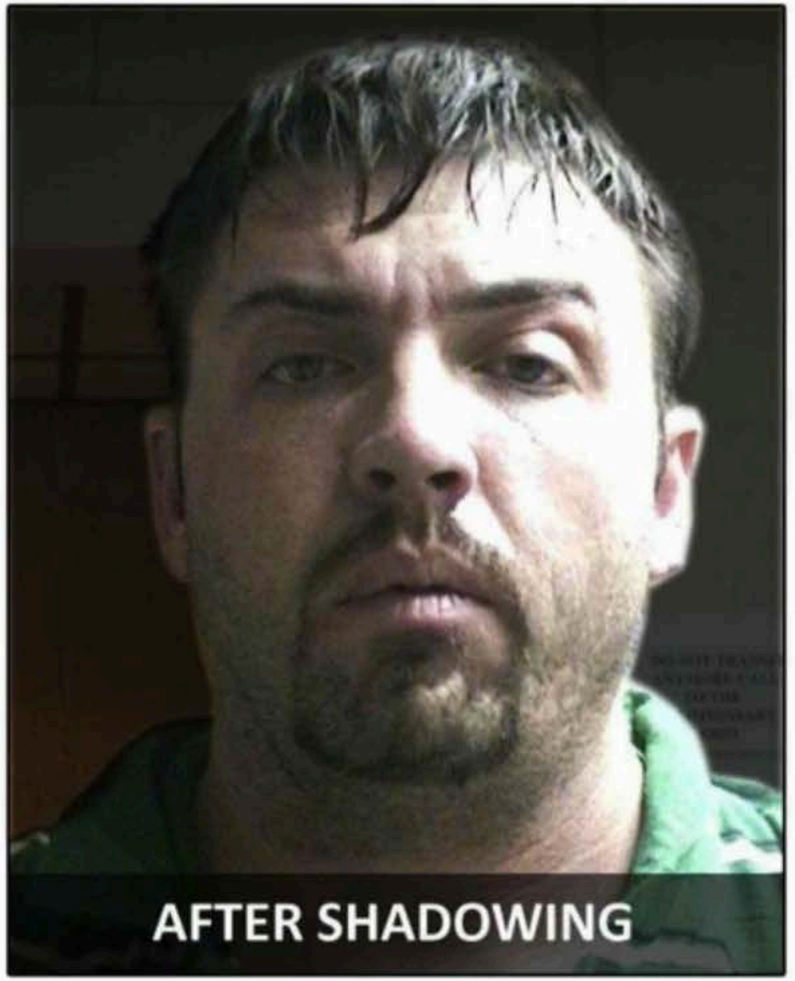
ORIGINAL

The SCALE enhancement can be used to correct images which have been resized in one or two dimensions.

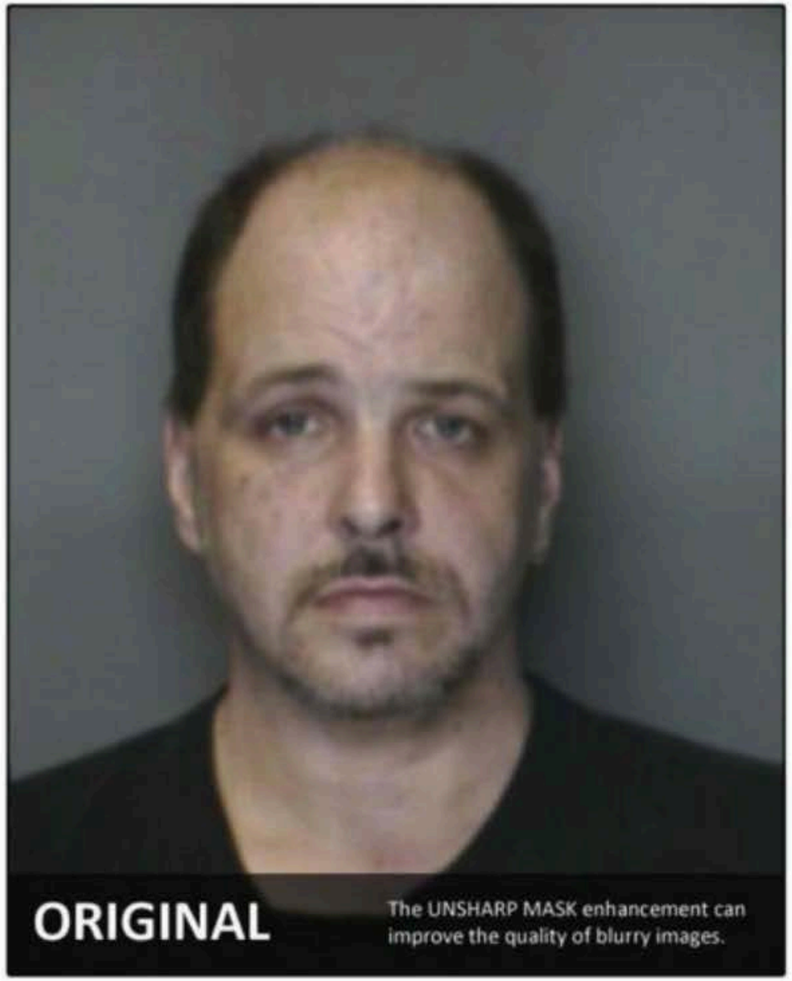
AFTER SCALING

UFW Enhancement: Shadowing

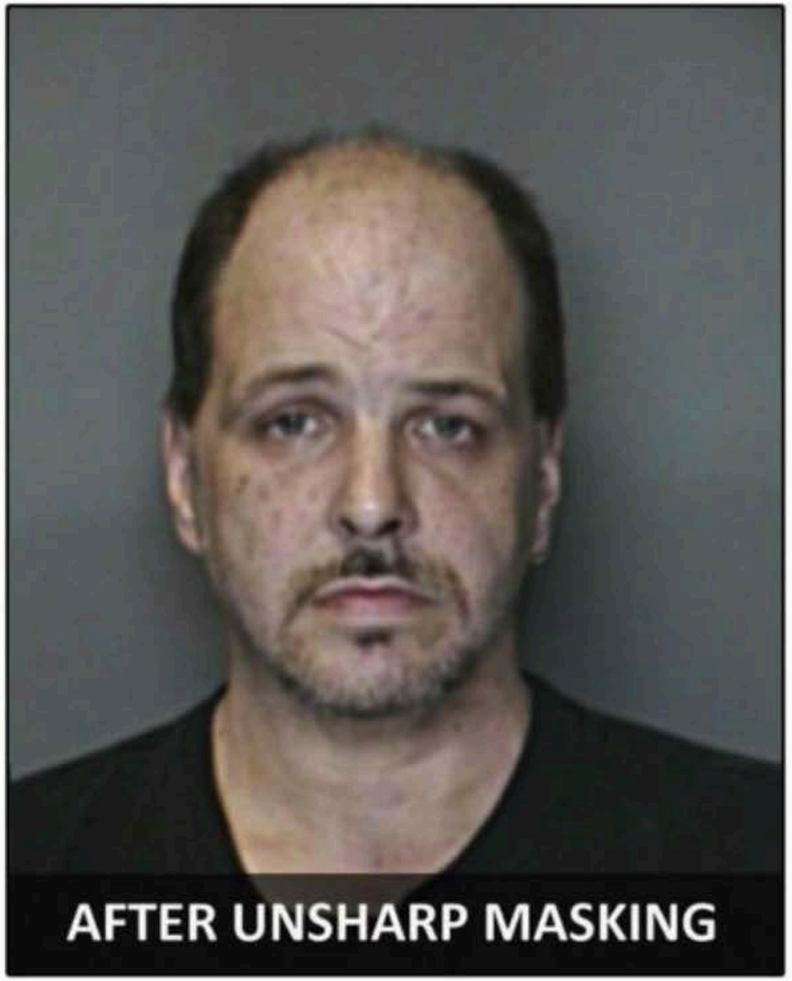




UFW Enhancement: Unsharp Masking



The UNSHARP MASK enhancement can improve the quality of blurry images.



Iris Pilot

Iris Trade Study

- Compared vendor solutions against NGI functional performance requirements.
- Solutions encompassed a “turn-key” system for both capture and matching
- Leveraged NIST IREX Testing Results.
  - Over 4 million Iris images made up the test data set

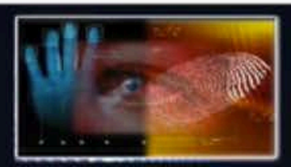
Iris

Why Iris:

- Matching is highly accurate with rates at 98.4% for a single iris and even higher for dual
  - Excellent candidate for “Lights out” search operations
  - Quick, clean, minimal contact capture potential
- Hardware sizing is also a positive of iris
  - Templates measuring around 2kb for a single subject (1kb per iris) where as traditional 10 print records can range from 30KB to 100KB; major hardware savings as the storage space for irises is significantly smaller than that of ten-prints.

NGI Iris Pilot Scope

- Supervised Release / Corrections (Fed/State)
- Begin building a National Iris Repository
- Search in 1 to N mode
  - Return top Candidate
  - Improve Response Time Requirements
- Support first steps of Device Certification
- Best Practices



NGI Iris Pilot Objectives

- Iris Searching
  - The pilot will allow users to perform verification and identification searches
    - Probation/parole identity checks, correctional inmate management, national search capabilities to agencies currently using iris technologies
  - Simultaneously verifying initial iris use cases and device specifications
  - Continue building an Iris Repository
    - Iris datasets are not as prevalent as fingerprint or face; however they do exist

Contact Information

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Next Generation Identification Program Office

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