



Universal Face Workstation

NEXT GENERATION IDENTIFICATION

*Implementing the future of
identification & investigative services*

RAP BACK

RAPID MOBILE ID

IRIS

FACIAL

LATENTS

PALMS





Universal Face Workstation

UFW Foundation

Featur



UFW Objectives

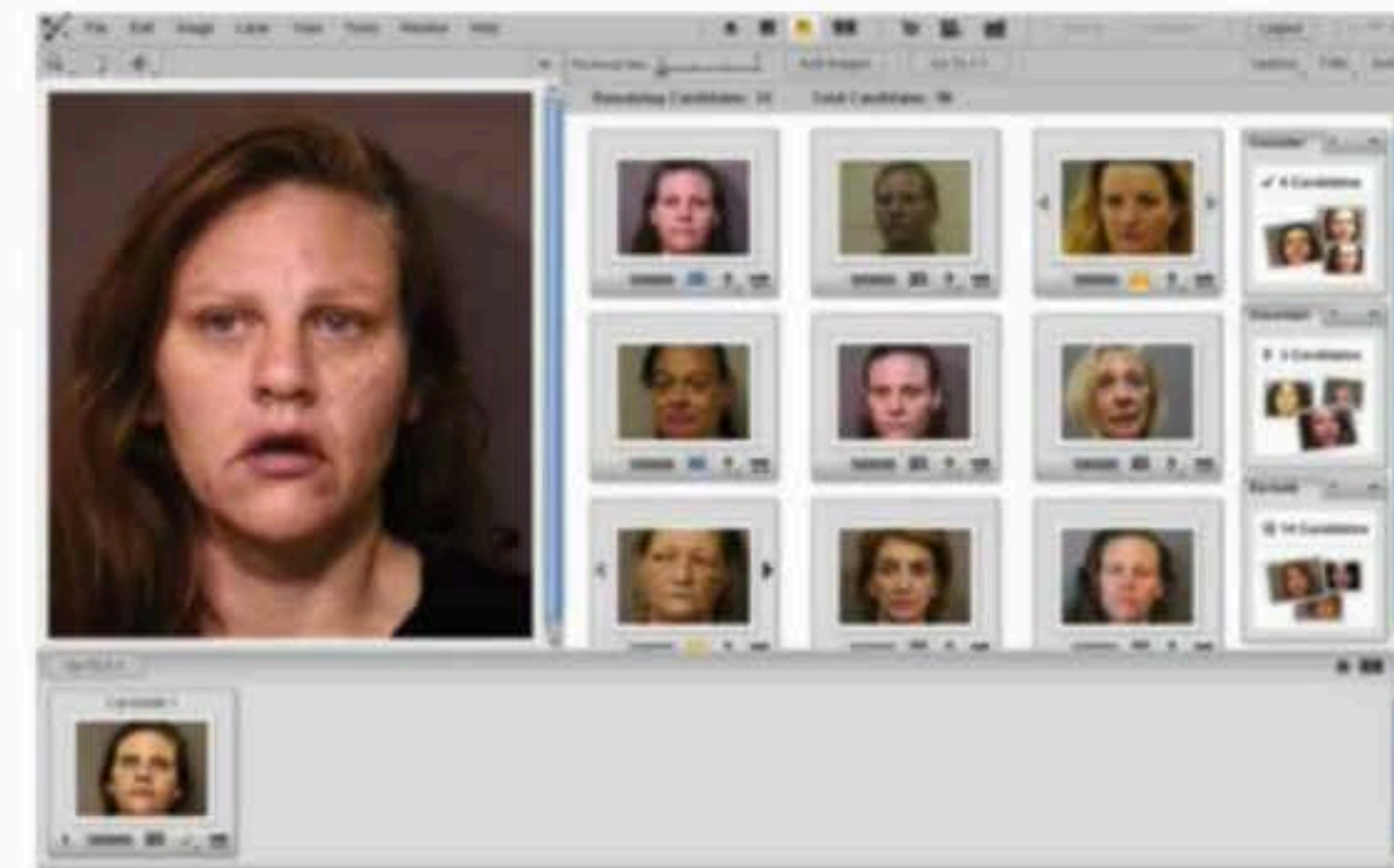
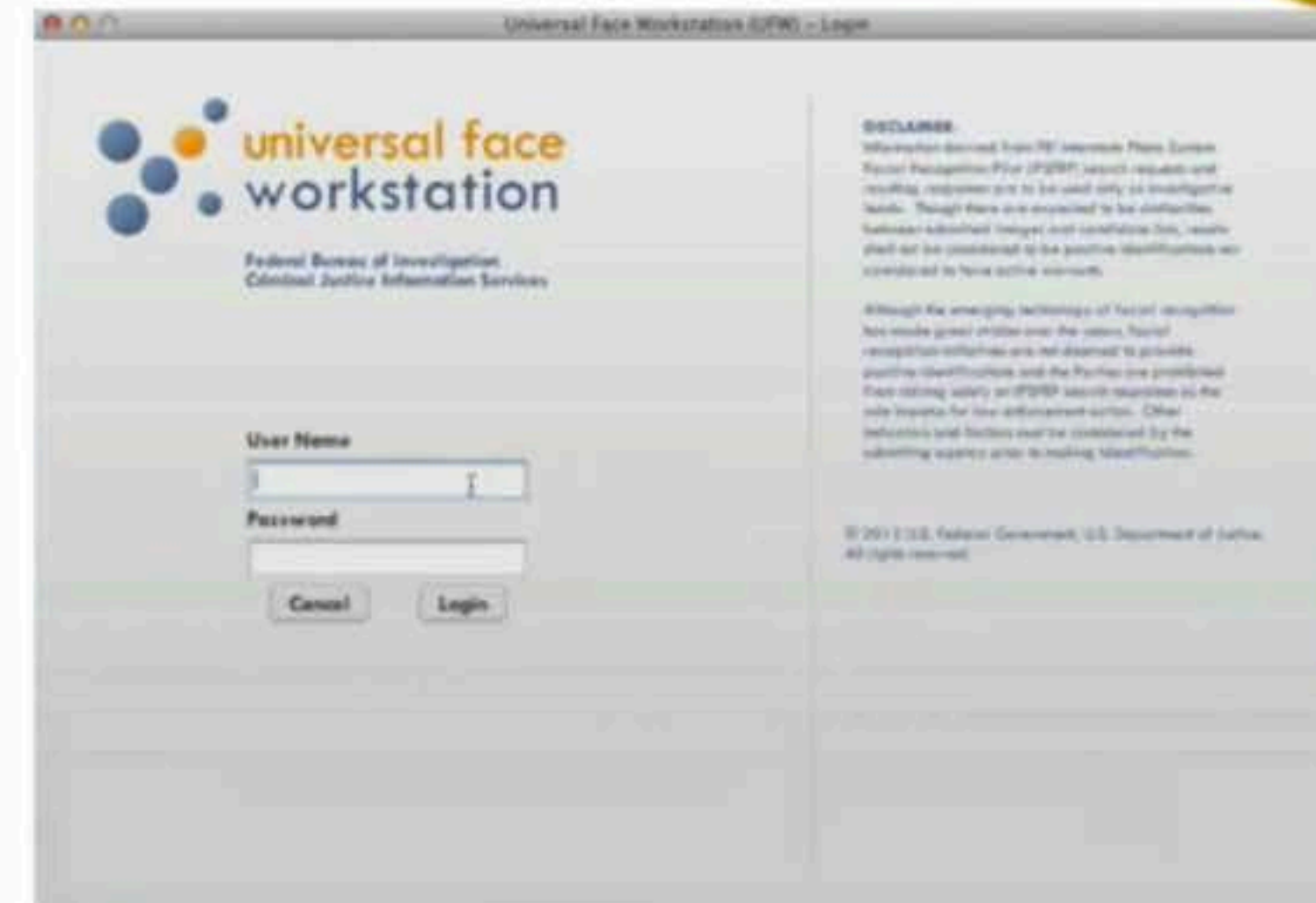
- Plan, design, prototype and demonstrate a face workstation which can be freely deployed by the FBI
- Develop services which can be carried over to NGI Increment 4 HMI for face search processing
- Design user interface specifically for face examiners
- Permit examiners to:
 - Acquire, analyze and enhance 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



Universal Face Workstation (UFW)



- FBI user software to support access to NGI Face Pilot and NGI System face search capabilities
- Search preparation, submission, and candidate list review
- Cross Platform (Windows, OSX, Linux)
- Built on open source frameworks
- Extensive support for user developed plugins
- Available for authorized Law Enforcement use free of charge

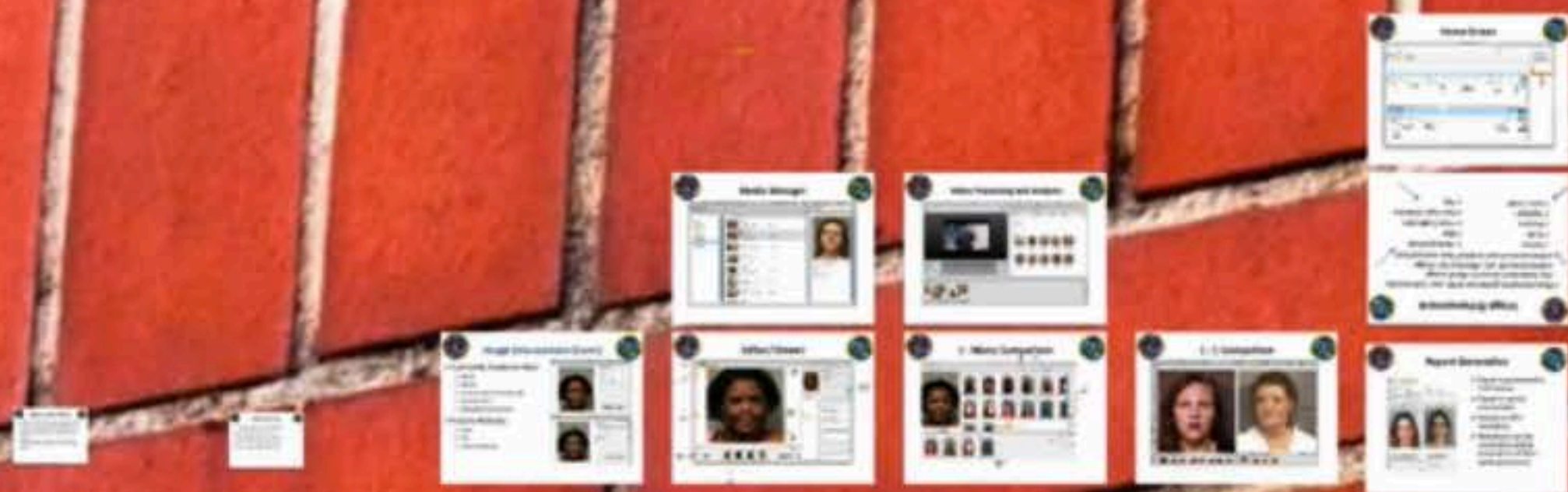


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UFW Software

Features & Capabilities

Inter





Media Manager Features

- Detects and clusters faces across videos and images
- Detects events and objects of interest in media sources, including loud noises, movement and skin
- Interface for analyzing and managing images and clusters
- Scalable solution – can deploy on a single local machine as well as distributed across a cluster of servers



UFW Capabilities

- Extract face images from media/storage devices
- Enhance face images and prepare search TOTs
- Submit face search TOTs to FBI face pilot
- Receive and review candidates in response TOTs
- Request additional images based on FNU/UCN
- Generate reports based on candidate review
- Provide Transaction and Case Management



Here is what an analyst would see



Home Screen

Universal Face Workstation (UFWB) - Home

Navigation Bar

universal face workstation
Version 5.0.0.0, Federal Bureau of Investigation

Sorting: Default
Filtering: Blank

Cases

| Status | Case ID | Description | Workflows | Creation Date | Close Case |
|-------------------------------------|---------|-------------|-----------|-----------------------|-----------------------|
| <input checked="" type="checkbox"/> | case 1 | case 1 desc | 4 | Thu 04/26/12 11:33:18 | Close |
| <input checked="" type="checkbox"/> | case 2 | case 2 desc | 0 | Thu 04/26/12 11:50:23 | Close |
| <input checked="" type="checkbox"/> | case 3 | case 3 desc | 0 | Thu 04/26/12 11:50:30 | Close |
| <input checked="" type="checkbox"/> | case 4 | case 4 desc | 0 | Thu 04/26/12 11:50:41 | Close |
| <input checked="" type="checkbox"/> | case 5 | case 5 desc | 0 | Thu 04/26/12 11:50:48 | Close |

Case Status Case ID (OCA) Case Description Number of Workflows Creation Date Close Case

Workflows Within Selected Case

| Status | Type | Creation Date | Decision | Complete Workflow |
|-------------------------------------|------|-----------------------|----------|--------------------------|
| <input checked="" type="checkbox"/> | | Thu 04/26/12 11:51:22 | | Complete |
| <input checked="" type="checkbox"/> | | Thu 04/26/12 11:33:21 | | Complete |
| <input checked="" type="checkbox"/> | | Thu 04/26/12 11:51:49 | | Complete |
| <input checked="" type="checkbox"/> | | Thu 04/26/12 11:52:05 | | Complete |

Workflow Status Workflow Type Creation Date Workflow Decision Close Workflow

Create New Case
New Image Search
New Text-Based Image Request

New Cases/Tasks



Media Manager

Media Manager interface showing a list of media files in Folder E.

File List:

| Image | Filename | Date Created | Date Captured | File Type | Agency | Status |
|-------|------------|--------------------|--------------------|------------|--------|---------|
| | image1.jpg | 7/7/11, 6:39:28 PM | 7/7/11, 6:39:28 PM | Image, JPG | NSI | Pending |
| | image2.jpg | 7/7/11, 6:39:28 PM | 7/7/11, 6:39:28 PM | Image, JPG | NSI | Pending |
| | image3.jpg | 7/7/11, 6:39:28 PM | 7/7/11, 6:39:28 PM | Image, JPG | NSI | Pending |
| | image4.jpg | 7/7/11, 6:39:28 PM | 7/7/11, 6:39:28 PM | Image, JPG | NSI | Pending |
| | image5.jpg | 7/7/11, 6:39:28 PM | 7/7/11, 6:39:28 PM | Image, JPG | NSI | Pending |
| | image6.jpg | 7/7/11, 6:39:28 PM | 7/7/11, 6:39:28 PM | Image, JPG | NSI | Pending |
| | image7.jpg | 7/7/11, 6:39:28 PM | 7/7/11, 6:39:28 PM | Image, JPG | NSI | Pending |
| | image8.jpg | | | | | |

Preview Panel (Selected: image2.jpg):

Open File With:

image2.jpg
Date Created: 7/7/11, 6:39:28 PM
Date Captured: 7/7/11, 6:39:28 PM
File Type: Image, JPG
Agency: NSI
Status: Pending



Video Processing and Analysis



File Edit Image Layer View Tools Window Help

Submit Complete Logout

Video Player

The video player shows a frame from a video with a person in a dark jacket. Below the video is a timeline with a play button and a progress bar showing 0:33/10:56. There are also sliders for Faces, Motion, and Skin.

0:33/10:56

Faces Motion Skin

Video Information

| File Name | Date Created | File Type | Status |
|------------|--------------|-----------|------------|
| movie2.mov | 11/15/2011 | MOV | Status [X] |

Data Acquired:

Other Metadata:

Keyframes:

Keyframe 1:
00:01:12

Keyframe 2:
00:01:36

Keyframe 3:
00:02:27

Keyframe 4:
00:02:44

Keyframe 5:
00:03:16

Keyframe 6:
00:04:03

Keyframe 7:
00:04:47

Keyframe 8:
00:05:29

Keyframe 9:
00:07:09

Keyframe 10:
00:08:52

New Group Sort

Group 1

Group 2



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
- Flip



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UFW Software

Features & Capabilities

Participation

Integration/Installation/Requirements





Questions?



UFW System Requirements

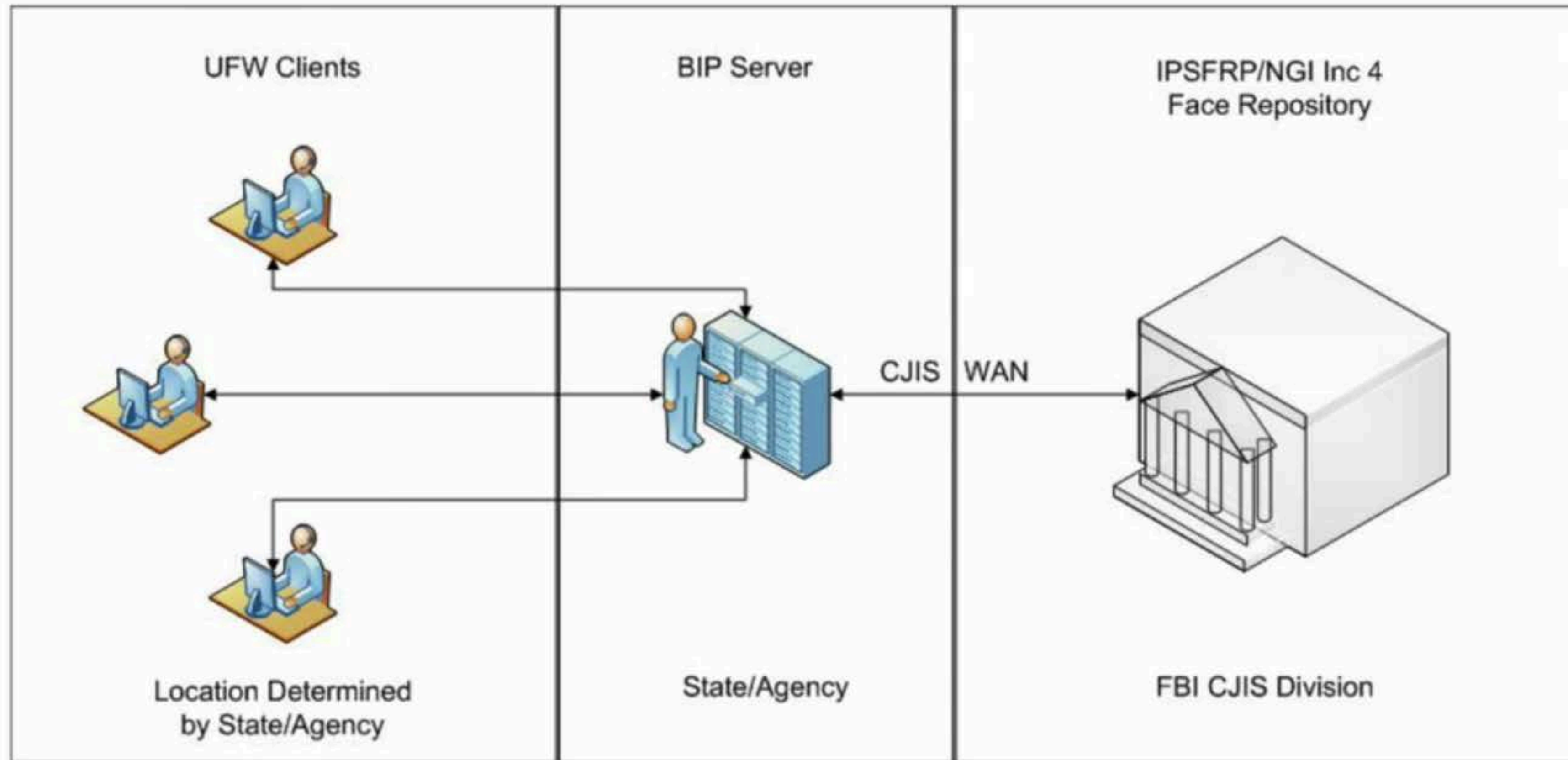
| Deployment Model | | |
|------------------|---|--|
| | Standalone Installation | Network Installation |
| Description | A complete installation of Workstation and Server intended for users who need the whole system on their laptop. | In this model, the Workstation software is installed on multiple desktop/laptop systems in the office. All workstations will depend on a single instance of the Server software that is typically installed on a physically secure server. |

| Minimum Workstation Requirements (UFW) | | |
|--|---|---|
| | Standalone Installation | Network Installation |
| Operating System | Windows 7/ CentOS or RHEL 5.6 (or greater) /Mac OS X (10.4 or greater) | |
| CPU | 2 GHz or faster 32-bit (IA-32) or 64-bit (x86-64) (recommended) processor | |
| Memory | 4 GB | 2 GB (2.5 GB for Windows 7) |
| Hard Drive Space | 1 GB of available space (does not include storage of face or case data) | 500 MB of available space (does not include storage of face or case data) |
| Graphics Hardware | Graphics cards supporting Java 3D 1.5.1 | |
| Network | Connection to CJIS WAN | Network connectivity to BIP server |

| Minimum Server Requirements (BIP) | | |
|-----------------------------------|-------------------------|--|
| | Standalone Installation | Network Installation |
| Operating System | N/A | CentOS / RHEL (6.0 or greater) ¹ |
| CPU | | 2GHz 64-bit (x86-64) processor |
| Memory | | 4 GB |
| Hard Drive Space | | 1 GB available (does not include storage of face or case data) |
| Graphics Hardware | | Graphics processors supporting Linux X11 (recommended) |
| Network | | Connection to CJIS WAN |



Basic UFW/BIP Installation





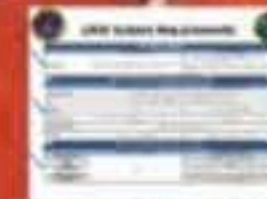
Biometric Integration Platform (BIP)



- Transaction and Case Management
- Message processing
 - Correlation
 - Routing
 - Format conversion
- Large scale deployments
- Application server
- Admin console web application
- Integration node
- Cross-agency collaboration
- Integration with back-end systems

Participation

Integration/Installation/Requirements





Report Generation

universal face workstation

| Report Information | |
|--------------------|----------------------|
| Report Number: | X873242 |
| ORI: | NY0303000 |
| Case Number: | Q880312405 |
| TCN/TCR: | 12345678900987654321 |
| Submission Date: | 3/27/2012 |
| Priority: | 2-High |
| Result: | Likely Candidates |
| Rank: | 2 |
| Match Score: | 1.45 |
| Candidate UCN: | 410520860 |
| Image Request: | Yes (10) |

| PROBE | CANDIDATE |
|---|--|
|  |  |

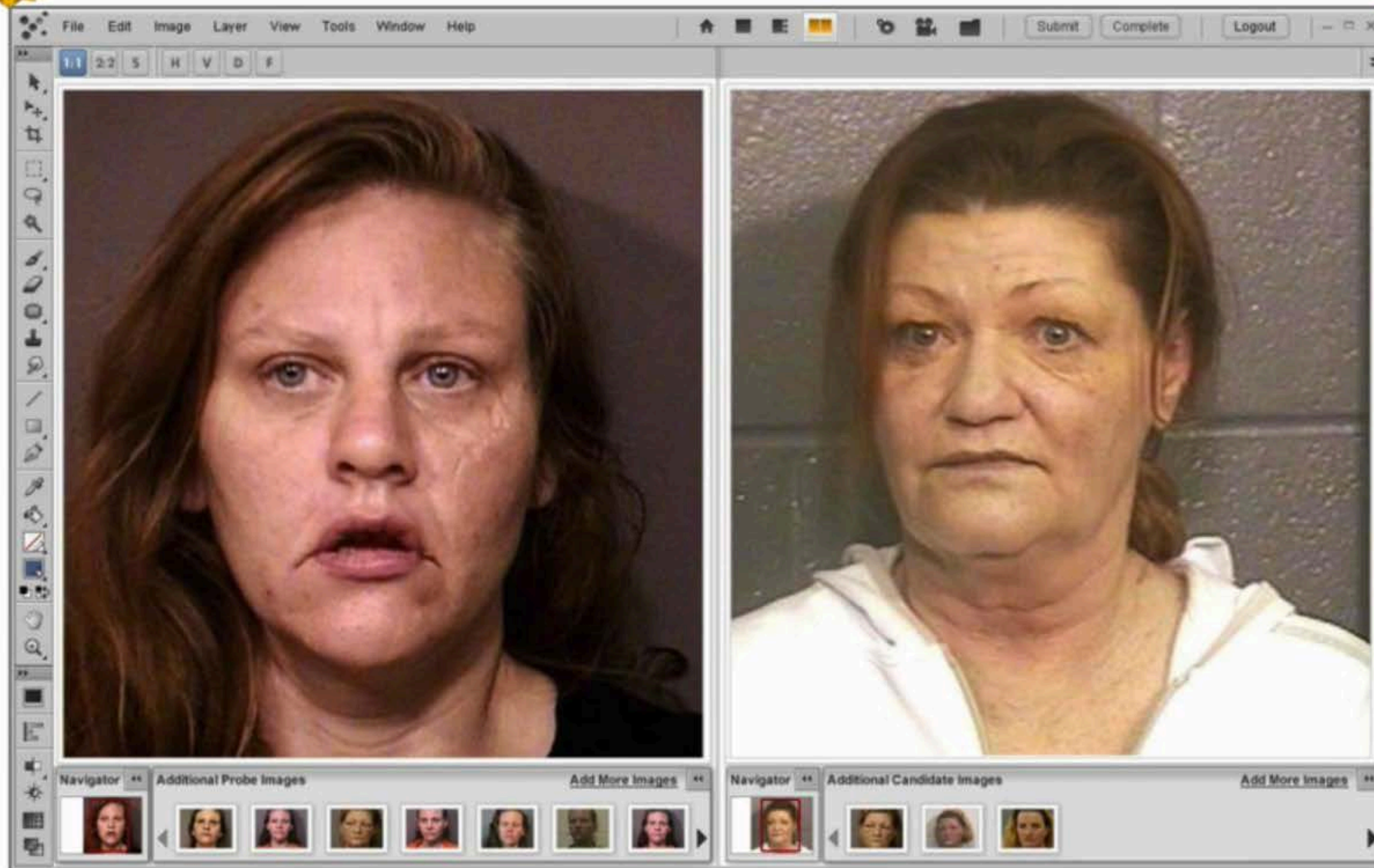
| Additional Information | |
|--|---------------------------------------|
| Notes: | Department of Justice |
| Candidate appeared three times in SIFP at ranks 2, 3, and 5. The likely candidate conclusion was confirmed by examiner John Smith. | Federal Bureau of Investigation |
| | Criminal Justice Information Services |
| | 1000 Custer Hollow Road |
| | Clarksburg, WV 26306 |
| | Prepared by: |
| | Jane Doe (EID: 870987) |
| | 14:34:21 21 May 2012 |

Page 1 of 4

- Reports generated in PDF format
- Reports can be customized
- Based on XML templates
- Templates can be created/modified external to UFW in word processors



1 : 1 Comparison





1 : Many Comparison

Grid Options Grid Filters

Probe Image

Decision Targets

Candidate Grids

Navigate to 1:1

Complete Analysis

Navigate to 1:1

Consideration Panel

The screenshot shows the '1:Many Comparison' software interface. On the left is a large 'Probe Image' of a woman. To its right is a 'Candidate Grids' section displaying a 3x6 grid of 18 smaller face images, each with a number and a similarity score. Below this is a 'Consideration Panel' showing a row of four images. On the right side, there is a 'Decision Targets' panel with a vertical scale showing '4' (green), '0' (yellow), and '0' (red). At the bottom right, there are buttons for 'Complete Analysis' and 'Navigate to 1:1'. The interface also includes 'Grid Options' and 'Grid Filters' tabs at the top.

on
on



Editor/Viewer

Plugins

Image Tools

Probe Image

Image Navigator

Image History

Submit Probe

Transaction Accordion

Navigate to Home Screen

Image Grid

Navigate to 1:N

The screenshot shows the Editor/Viewer application interface. The main window displays a large probe image of a woman. To the right of the probe image is the Image Navigator, which shows a smaller version of the probe image. Below the Image Navigator is the Image History section, which is currently empty. To the right of the Image History is the Transaction Accordion, which contains various fields for transaction information, including Package Information, Version Number (VER), Date (DAT), Priority (PRY), Destination Agency ID (DAG), Originating Agency ID (ORAG), Originating Agency Case Number (OCA), Transaction Control Number (TCN), Alert Indicator (ATI), Send-Only To (SOOT), Contributor Case Identifier Number (CIN), Contributor Case Profile (CIN, PRE), Contributor Case Identifier (CAI, ID), Contributor Case Identifier Extension (CIE), Controlling Agency ID (CON), Miscellaneous Identification Number (MIN), and Number of Candidates Returned (NCR). At the bottom of the application is the Image Grid, which shows a row of four small images. The first image is the probe image, and the other three are smaller images of the same woman. The Image Grid is labeled "Image Grid" and "Navigate to 1:N". The "Submit Probe" button is located at the bottom right of the Image Grid. The "Navigate to Home Screen" button is located at the bottom left of the Image Grid. The "Plugins" and "Image Tools" labels point to the top left of the application window. The "Transaction Accordion" label points to the right side of the application window.



Image Enhancement (Cont.)



➤ Currently Implemented:

- Resize
- Rotate
- Unsharp Mask (sharpening)
- Gaussian Blur
- Histogram Equalization

➤ Future Release:

- Crop
- Flip
- Feature Markup

