\Orchestrating a brighter world **NEC**

Advanced Investigative and Identity Solution
Using NEC's NeoFace® Technology

# Introducing Upgraded Reveal - The Future of Biometrics Revealed!

At a Glance

- Forensic facial recognition solution for investigation and identification
- Extensive image enhancement tools to create for and search low-quality probes from images or video
- Available FISWG-compliant morphological analysis for detailed verification of potential matches
- Fastest and most accurate face recognition as proven by the National Institute of Standards & Technology (NIST) in their Face Recognition Test Evaluation (FRTE)
- EverBlu Algorithm Updates for new facial recognition technology and application software

- Evidence and case management to keep track of all investigative cases
- Standard, customized and/or configurable workflows to optimize agency and operators' efficiency
- Supports multiple image and video formats
- Easy-to-Use web browser user interface-experience
- Supports large databases, watchlists and special galleries too without sacrificing speed or accuracy
- Accelerates criminal investigations, identity verification, and fraud detection and prevention

Overview

Facial recognition has become a required technology for many government agencies to support investigations and to detect fraud.

For law enforcement agencies, the ability to quickly identify a suspect or a victim using crime scene images or videos helps speed up the investigative process and effectively solve cases. Facial recognition has proven to be a critical piece of the law enforcement tool kit, and its value continues to grow as it becomes more ingrained in the way agencies do business and the policies that surround it.

Identity theft and fraud are examples of the types of crime that law enforcement agencies use facial recognition to detect and prevent. Whether a criminal is obtaining a driver license in another person's name or applying for social services benefits using a false identity, identity theft and fraud have a significant, financial impact on both organizations and individuals. By utilizing face recognition technology at the beginning of the application process, government agencies can easily identify fraudulent applicants and prevent stolen credentials from falling into the wrong hands—saving organizations and individuals valuable time and money.
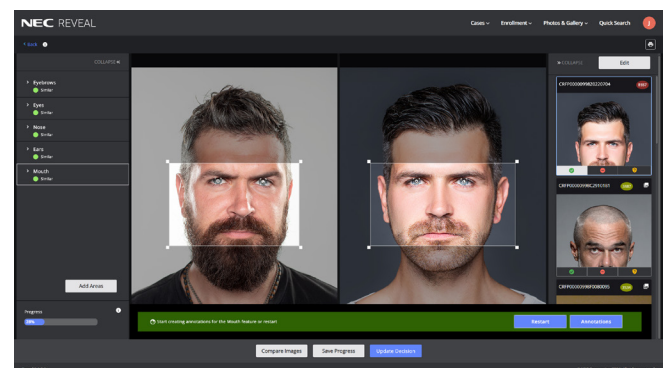
A leader in face recognition technology for over 33 years, NEC is uniquely positioned to support government agencies in providing advanced recognition solutions for criminal investigation and fraud prevention.

Independent testing from NIST confirms that NEC's Reveal facial recognition technology provides the fastest, most accurate matching capability and is the most resistant to variants in age, race, and pose angle. Government agencies can feel confident knowing they have the most accurate and extensive capabilities in the market and that their employees, business practices, and results can be defended.

Solution

NEC's Reveal is a forensic facial recognition application providing law enforcement, crime laboratories, and civil applicant processing agencies the ability to identify facial images (ranging from good to very poor quality) by performing either a one-to-many (1:N) search or one-to-one (1:1) match against a database of any size, whether thousands, millions or even over a billion images.

When an investigator submits a search transaction, Reveal compares the probe image against the database images and provides a ranked candidate list, allowing the investigator to easily scroll through and perform a quick assessment of candidates. When a match is found, the investigator can select the individual candidate(s) for more verification and perform a detailed comparison of detailed facial attributes to confirm the subject's identity. This verification process can be repeated for each potential candidate.

In addition to providing intuitive search and verification tools, Reveal also maintains a complete audit trail of the investigation—from case entry and search submission to case review and disposition—to keep track of every step taken in each case.

Advanced Enhancement & Review Tools

Image enhancement algorithms can improve matching accuracy for poor-quality images or faces captured at an angle. Reveal provides a comprehensive set of standard and advanced image processing enhancements to improve image quality and matching ability.

NEC's Reveal enables investigators to enhance poor-quality face images for comparison to their image repositories. This allows system operators to create a list of all potential matches while maintaining a full audit trail for each step in the image enhancement process.

Standard image enhancements can help skilled experts by improving detail and removing background noise. Enhancements include crop/rotate, brightness, contrast, intensity, smooth, sharpen, histogram equalization, noise reduction, aspect ratio correction, and de-interlacing.

Reveal also provides a suite of verification tools that help experts identify the suspect quickly and efficiently, allowing investigators to act upon the search results during the critical time period after a crime has been committed. In addition to side-by-side comparison and markup, Reveal also delivers several advanced capabilities and functionalities:

QUICK SEARCH	Provides an examiner with the option to immediately acquire and select an image probe for lights-out 1:N search. This can expedite an investigation and promote great ease of use.
PHOTOBOOKS AND MORE	Enables an agency to create galleries or libraries of select groups of persons to facilitate both case and image management. Also supported is line-up creation for witness review.
VIDEO FACE DE-CLUSTERING	Processes multiple video files to quickly detect dissimilar faces across multiple frames. Reveal also supports automated cross-searching of these dissimilar faces against master database galleries of known and unknown faces.
MORPHOLOGICAL ANALYSIS	Provides detailed verification tools compliant with standards established by the Facial Identification Scientific Working Group (FISWG). After the primary verification of a search, the forensic examiner has the option to further compare and review the probe image against the potential candidate image(s).

Support Multiple Image & Video Formats

Reveal can process face images obtained from either still images or video streams.

Still images can be imported through two different methods, depending on source and intended use. The first method is to select a single file from a local directory. This uses the standard Microsoft® Windows® file selection dialog box. The second method is to batch input all images within a selected directory. For both single file and batch input methods, multiple image file formats are supported, including JPEG, BMP, TIFF, PGM, PNG, PSD, J2K, and WebP. Also, EBTS, NIST or XML formatted files are also supported too.

Video processing also supports both single file input (from a local directory) and batch input (e.g., from a video management system). A variety of digital formats are supported, including MPEG, MOV, WMV, AVI and WebM.

Imported images are stored as evidence within a case, from which image probes can be selected. For potential probes, facial templates are extracted, and quality metrics are displayed, overlaying each image. This quality data can help determine the best images for search processing.

Unsurpassed Accuracy & Matching Speed

The strength of NEC's Reveal technology lies in its tolerance of poor quality as well as demographic diversity, whether age, gender, or race. Highly compressed surveillance videos and images, previously of little or no value, are now usable evidence, leading to higher rates of positive identification. With its ability to match low-resolution face images down to 24 pixels between the eyes, NEC's Reveal technology outperforms all other face recognition algorithms in matching accuracy in the areas of poor image quality, vast age ranges or different demographic groups. Similar to searching latent prints from crime scenes, Reveal assists experts to positively identify unknown subjects.

Introducing The New Reveal – The Future of Biometrics Revealed

The present version of Reveal will be replaced by the newly upgraded Reveal, which enhances user experience by offering an easier user interface (UI) for case management, submission, quality control and search verification. The new UI features a home page as well as simplified search verifications and quality control edits.

EverBlu Algorithm & Application Updates

We are also introducing EverBlu Algorithm, our future-forward lifetime algorithm updates. Reveal clients will get free algorithm and matcher upgrades for life! NEC will proactively convert the customer's biometric data so they can benefit from the latest algorithms without the need for a lengthy and expensive data conversion project. When you purchase Reveal, you invest in a continuously evolving product, ensuring you can always access the latest advancements and innovations.

A cloud-native solution built on Microsoft® Azure®, Reveal is a cost-effective biometric solution purpose-built to lower total cost of ownership.

Future upgrades and additional capabilities include:

- EverBlu Algorithm, EverBlu Algorithm, lifetime algorithm updates, ensuring your investment remains cutting-edge indefinitely.
- New Biometric Match Service and better Paro Matchers deliver greater accuracy and faster facial recognition matching, further empowering Morphological Analysis for examiners to review eighteen different facial areas for more detailed verification.
- Tattoo recognition, providing forensic examiners with more tools for investigations.

To learn more about the newly upgraded Reveal and other innovations in identification and verification, visit NEC Advanced Recognition Systems at www.necam.com/advancedrecognitionsystems.

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