



# DRAFT Glossary of AFIS Terms

Latent Print AFIS Interoperability Working Group



**LES**

LAW ENFORCEMENT  
STANDARDS OFFICE

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National Institute of Standards and Technology



## FOREWORD

This is one of a series of documents prepared by the Latent Print Automated Fingerprint Identification System (AFIS) Interoperability Working Group. The purpose of these documents is to provide guidance and a framework to those involved in the identification process who may be tasked to be a project leader or member of a working group for an AFIS purchase, replacement, upgrade, or move to a more biometrics-based identification process.

Each agency has its own procedures as well as policies and laws that are applicable in the procurement process. The information contained in these documents should be considered as complementary.

### The Latent Print AFIS Interoperability Working Group

The lack of latent print search interoperability and the subsequent missed opportunities to make identifications have been long recognized as serious issues within the examiner community. Latent print examiners, AFIS managers, vendors, governmental agencies, and professional organizations have explored opportunities to improve interoperability. Since the introduction of AFIS systems in the 1980s and the Federal Bureau of Investigation's Integrated Automated Fingerprint Identification System in the late 1990s, latent print identifications have risen on a hierarchical level but not on a peer-to-peer basis.

As part of a National Institute of Justice (NIJ)/National Institute of Standards and Technology (NIST) effort to address the lack of AFIS interoperability, the Law Enforcement Standards Office (OLES) formed the Latent Print AFIS Interoperability Working Group. The mission of this Working Group is to improve latent print AFIS interoperability by developing a clear understanding of the issues and challenges to latent print AFIS interoperability and to identify collaborative ways to actively address this national problem.

The first meeting of the Working Group was held in April 2008. The release in February 2009 of the National Academy of Sciences' report, *Strengthening Forensic Science in the United States: A Path Forward*,<sup>1</sup> gave further support to the issue at a national level.

The Working Group consists of federal, state, and local representatives, as well as vendors and other members of the identification community. These include the following:

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<sup>1</sup> National Academy of Sciences, National Research Council, Committee on Identifying the Needs of the Forensic Science Community. *Strengthening Forensic Science in the United States: A Path Forward*. National Academies Press, 2009.

### State and Local Representation

Broward County, Florida, Sheriff's Office  
 Culver City, California, Police Department  
 Illinois State Police, Forensic Science Center at Chicago  
 Los Angeles County, California, Sheriff's Department  
 Nlets  
 New Hampshire Division of State Police Forensic Laboratory  
 New York State Division of Criminal Justice Services  
 San Francisco, California, Police Department  
 Santa Monica, California, Police Department  
 South Carolina Crime Information Center  
 Texas Department of Public Safety  
 Western Identification Network, Inc.

### Federal Representation

Department of Homeland Security  
 FBI Criminal Justice Information Services Division  
 NIJ Office of Science and Technology  
 NIST Information Technology Laboratory  
 NIST Law Enforcement Standards Office

### AFIS Technical Advisors and Vendor Representatives

While many individuals contributed to the success of this project, the following are noted for having made significant contributions of their time, talent and vision:

Susan Ballou	National Institute of Standards and Technology
Anthony Clay	United States Secret Service
Joi Dickerson	Culver City, California, Police Department
Mike Garris	National Institute of Standards and Technology
Peter T. Higgins	Higgins & Associates, International
Janet Hoin	New York State Division of Criminal Justice Services
Lisa Jackson	Santa Monica Police Department
Mike Lesko	Texas Department of Public Safety
Joe Morrissey	New York State Division of Criminal Justice Services
Leo Norton	Los Angeles County, California, Sheriff's Department.
Beth Owens	Franklin County, Ohio, Sheriff's Office
Joe Polski	International Association for Identification (Ret.)

Mr. Anthony Clay of the United States Secret Service is particularly recognized for his contributions to the Glossary.

The objectives of the Working Group in the preparation of these documents were to:

- Define the issues and challenges to latent print AFIS interoperability
- Identify opportunities to actively address latent print interoperability
- Develop guidelines to provide guidance on technical and administrative issues

The Working Group developed this and other documents to meet the needs of latent print examiners, AFIS users, managers, vendors, and policy makers to establish interagency latent AFIS interoperability. This document is one in a series of reference documents to help agencies achieve interoperability, located at <http://www.fingerprint.nist.gov/>.

### About the Glossary

This Glossary was developed from many sources. To support the standardization of use, wherever possible the acronyms, abbreviations, and their definitions were extracted from federal- and industry-recognized sources. There is no single nationally or internationally recognized glossary of AFIS terms. Like the differences between dictionaries, each source presents a slightly different wording for the same concept.

For example, there are differences in the definition of the word “glossary” between the *Merriam-Webster Online* (“a collection of textual glosses or of specialized terms with their meanings”), *Webster’s New World College Dictionary* (“a list of difficult, technical, or foreign terms with definitions or translations, as for some particular author, field of knowledge, etc., often included in alphabetical listing at the end of a textbook”), and the *Oxford Dictionaries Pro Online* (“an alphabetical list of terms or words found in or relating to a specific subject, text, or dialect, with explanations; a brief dictionary”). Is one right and the others wrong?

The reader is encouraged to refer to additional sources such as the Scientific Working Group on Friction Ridge Analysis, Study and Technology and other nationally recognized authoritative sources for complementary descriptions. Definitions that were pulled in whole or in part from other sources include a reference to that source in parentheses. A list of acronyms follows the Glossary in Appendix A.

**ACCEPTANCE TESTING**—1: A thorough test of an AFIS prior to taking ownership and making payment. 2: Those tests that are intended to determine that all equipment and software functions and complies with the contract specifications and to determine the reliability of the system. (ANSI/IAI)

**ACCESS RIGHTS**—Profile of a user composed of options to enable specific AFIS functions. For example, ten-print staff members cannot access latent print functions unless granted access rights to those functions.

**ACCURACY**—1: A software quality metric that provides those characteristics for required precision in calculations and outputs. 2: A measure of the AFIS's ability to place the correct mate within a specific position on the candidate list as a result of the matching process. (ANSI/IAI) 3: The closeness of agreement between the AFIS-generated representation of a fingerprint compared with the fingerprint it represents. (ANSI/IAI)

**ACE-V**—The process for identifying latent fingerprints, which involves Analysis, Comparison, Evaluation, and Verification:

- Analysis* is the qualitative and quantitative assessment of Level 1, Level 2, and Level 3 Details to determine proportion, interrelationship, and value for individualization.
- During *Comparison*, the latent print examiner looks at the attributes noted during analysis for differences and agreement between the latent print and the known exemplar.
- Evaluation* follows extensive comparison by making a determination if two impressions were made by the same source, not from the same source, or if the information is inconclusive. (A determination is made as to the results of the Comparison process. The fingerprint community accepts three conclusions: (a) the latent print and known exemplar were made by the same source, (b) the latent print and known exemplar were not made by the same source, or (c) a conclusive comparison could not be determined. This could be due to a lack of comparable area in the known exemplar or lack of clarity due to improperly recorded known exemplars.)
- Verification* occurs when a second qualified examiner does an independent assessment of the latent print and known exemplar, utilizing the ACE process.

**ACTIVITY LOG**—A continuously updated record of system activity. (ANSI/IAI)

**ALGORITHM**—1: Mathematical routine used in computer processing. In AFIS processing, the matcher algorithm searches for relationships between the search print and ten-print. 2: Mathematical routine used in computer processing, e.g., an AFIS matching algorithm establishes the correlation of Level 2 Detail between fingerprints. (SWGFAST). 3: A step-by-step computational procedure for solving a problem. The system computer and other system components use algorithms to make decisions required to process and handle information. (ANSI/IAI)

**ALPHANUMERIC**—Non-image information related to a person, ten-print card, or latent case; may also be referred to as demographic data.

**AMERICAN NATIONAL STANDARDS INSTITUTE**—Institute founded in 1918 that administers U.S. voluntary standardization and conformity assessment.

**ANALYSIS**—1: The qualitative and quantitative assessment of Level 1, Level 2, and Level 3 Details to determine proportion, interrelationship, and value for individualization. 2: The first step in the ACE-V process.

**ANSI/NIST STANDARD**—Standard proposed by NIST and adopted by ANSI. For example, the ANSI/NIST-ITL standard *Data Format for the Interchange of Fingerprint, Facial & Other Biometric Information* is used by law enforcement, intelligence, military, and homeland security organizations throughout the world. The first version of this standard dates to 1986. Over the years, it has been updated and expanded to cover more biometric modalities beyond the original record type of fingerprint minutiae. (NIST)

**ARTIFACT**—1: Any distortion or alteration not in the original friction ridge impression produced by an external agent or action. 2: Any information not present in the original object or image inadvertently introduced by image capture, processing, compressions, transmission, display, or printing. (SWGFAST 2011)

**AUTHENTICATION**—1: A process to determine whether a digital image has been altered in any way since its capture. 2: A process used to determine whether an electronic file has the correct association, as with unique identifier, name, images, and criminal history record.

**AUTOMATED FINGERPRINT IDENTIFICATION SYSTEM**—1: An automated, minutiae-based identification system that may consist of two or more distinct databases comprising two-finger identification records and ten-finger latent cognizant records (records of individuals more likely to be found at crime scenes, for example, burglars). 2: A computer-based system for reading, cataloging, searching, matching, and storing fingerprints and related data. (ANSI/IAI) 3: A generic term for a fingerprint matching, storage, and retrieval system. (SWGFAST 2011)

**AXIS**—One of two intersecting lines superimposed on a displayed fingerprint image, used as a reference point to indicate orientation in a side-by-side comparison.

**BENCHMARK TESTING**—Standardized testing of a device or software to evaluate performance against some standard.

**BIFURCATION**—1: A point on a finger image where the friction ridge divides into two ridges. 2: The point at which one friction ridge divides into two friction ridges. (SWGFAST 2011)

**CANDIDATE**— 1: A master file record selected as a possible match to a current minutiae record, which results from either an automated name search or an automated (fingerprint) technical (AFIS) search. 2: A selection made by AFIS as a result of a search inquiry. (ANSI/IAI)

**CANDIDATE LIST**—The list of potential mates listed in descending order of their matching scores as determined by the matching process within the fingerprint minutiae matcher. A candidate list can also be produced by an Interstate Identification Index automated subject search. (ANSI/IAI)

**CARD SCAN**—1: An electronic scanning method of transmitting inked fingerprint impressions that meet local standards and the Federal Bureau of Investigation's image quality specifications and that are suitable for Store and Forward processing. 2: Electronic recording of friction ridge impressions (fingers and/or palms) from fingerprint cards, palm print cards, etc.; sometimes referred to as dead-scan or flat-bed scanner. (SWGFAST)

**CHARGED-COUPLED DEVICE**—1: An electronic chip capture device used in optical recording devices to convert light into electrical current. AFIS applications include digital cameras, card scans, Livescan, and other imaging equipment that captures fingerprint images on a chip. 2: An electronic chip capture device used in optical recording instruments that converts light energy into electrical current, e.g., the chip in a digital camera or scanner for capturing friction ridge impressions. (SWGFAST 2002)

**COMPUTERIZED CASE HISTORY** or **COMPUTERIZED CRIMINAL HISTORY**—Online case history information management system that lists all the criminal and non-criminal events that the identification agency is authorized to release to an inquiring agency; also referred to as the Rapsheet.

**CRIMINAL JUSTICE INFORMATION SERVICES**—A division of the Federal Bureau of Investigation.

**CERTIFIED LATENT PRINT EXAMINER**—A latent print examiner certified by the Latent Print Certification Board of the International Association for Identification.

**CODER**—Term for hardware, software, or both used to detect minutiae in a fingerprint image.

**COMPARISON**—1: The process of evaluating fingerprint images to be classified and/or identified for proper identification per user request. 2: The second step of the ACE-V method. 3: The observation of two or more impressions to determine the existence of discrepancies, dissimilarities, or similarities. (SWGFAST 2009)

**COMPRESSION RATIO**—Ratio of original file size as compared to the compressed file size. For AFIS, a 15:1 ratio is most often used.

**CONCLUSION**—Determination made during the Evaluation stage of ACE-V, including identification, inconclusive, or exclusion.

**CONSOLIDATION**—1: The merger of two or more records that are filed under more than one Federal Bureau of Investigation Number or identification number when it is determined that all pertain to one subject.

**CORE**—1: A well-defined center or focal point of a fingerprint image. 2: The approximate center or focal point of a friction ridge image (SWGFAST 2011). 3: A specific formation within a fingerprint pattern, defined by classification systems such as Henry.

**CONTROL TERMINAL AGENCY**—A state or territorial criminal justice agency on the National Crime Information Center system providing statewide or equivalent service to its criminal justice users. There is only one Control Terminal Agency per state or territory, and each operates under the supervision of a terminal agency coordinator.

**DATABASE**—A collection of data of a particular type, organized for efficient storage and retrieval (e.g., fingerprint minutiae data, fingerprint image data, or mugshot image data).

**DELTA**—That point on a ridge of a fingerprint image at or nearest to the point of divergence of two type lines and located at or directly in front of the point of divergence; also known as a tri-radius. (SWGFAST 2011)

**DIGITAL IMAGE RETRIEVAL SYSTEM**—An AFIS subsystem that contains the electronic fingerprint images.

**DOWN SAMPLING**—Process of representing an image with a smaller number of samples; may also be referred to as sub-sampling.

**ELECTRONIC BIOMETRIC TRANSMISSION SPECIFICATION**—A standard published by the Federal Bureau of Investigation for electronically encoding and transmitting biographic, biometric, and disposition information between federal, state, and local users and the Federal Bureau of Investigation, which specifies file, record content, format, and data codes.

**ELECTRONIC FINGERPRINT TRANSMISSION SPECIFICATION (EFTS)**—A standard published by the Federal Bureau of Investigation for electronically encoding and transmitting fingerprint images and identification and arrest data between federal, state and local users and the Federal Bureau of Investigation, which specifies file, record content, format, and data codes.

**ELECTRONIC TEN-PRINT SUBMISSION**—An electronic submission that originates at a Livescan booking terminal or card scanner at either the federal, state, or local level and is transmitted via the Criminal Justice Information Services wide area network to the Integrated Automated Fingerprint Identification System for processing. This type of electronic transaction contains fingerprint images and personal descriptor data. Processing of the transaction, including image comparison and the conclusion, is performed by Federal Bureau of Investigation personnel.

**ELIMINATION FINGERPRINTS**—1: Fingerprint images taken from persons with legitimate access to evidence under examination for latent fingerprint. 2: Exemplars of friction ridge skin detail of persons known to have had legitimate access to an object or location. (SWGFAST 2011)

**ENCODING**—AFIS process used to record minutiae.

**ERRONEOUS EXCLUSION**—The incorrect determination that two areas of friction ridge impressions did not originate from the same source. (SWGFAST 2011)

**ERRONEOUS INDIVIDUALIZATION**—The incorrect determination that two areas of friction ridge impressions originated from the same source. (SWGFAST 2011)

**EURODAC**—An AFIS formed by the European Union to track asylum seekers who apply for benefits.

**EVALUATION**—1: A determination by a latent print examiner about whether two impressions were made by the same source or different sources or if the information is inconclusive. 2: The third step in the ACE-V process.

**EXCLUSION**—The determination by an examiner that there is sufficient quality and quantity of detail in disagreement to conclude that two areas of friction ridge impressions did not originate from the same source. (SWGFAST 2011)

**EXEMPLAR**—1: An impression or image of friction ridge skin purposely collected with the knowledge of the subject. 2: The prints of an individual associated with a known or claimed identity deliberately recorded electronically, by ink, or by another medium (also known as known prints). (SWGFAST 2011)

**EXPUNGEMENT**—The process of either fully or partially purging data from a subject's record in the subject criminal history file. It results in the removal of all charges associated with the arrest covered by expungement while retaining the date of arrest and submitting originating agency identifier. Expungement requests are submitted by arrest or judicial agencies when an individual has been exonerated after initial arrest or released without charge and recorded as "detention only" or when so ordered by a court of appropriate jurisdiction.

**FALSE CANDIDATE**—A candidate selected by an AFIS search as a possible match, which is subsequently determined not identical.

**FEATURES EXTRACTION**—The system capability to identify from a scanned fingerprint digital image separately definable attributes, which may be discretely stored and used to classify and uniquely identify that fingerprint.

**FEDERAL BUREAU OF INVESTIGATION NUMBER**—A unique identifying number assigned by the Federal Bureau of Investigation to a subject of a fingerprint record of arrest who has not been identified as a previous offender in a search of the files.

**FINGERPRINT**—An impression of the friction ridges of all or any part of the finger. (SWGFAST 2011)

**FINGERPRINT CHARACTERISTICS**—Any aspects of fingerprints that can uniquely identify them.

**FINGERPRINT CLASSIFICATION**—1: A method for describing the common pattern fingerprint characteristics (e.g., pattern types or ridge counts) for the purpose of subdividing a fingerprint file into “classes” or groups having the same general characteristics so as to reduce the amount of the file needed to be searched to locate the mate (within the Integrated Automated Fingerprint Identification System, this may involve either Henry classification or pattern-level classification). 2: Grouping fingerprints according to shape and size for the purpose of filing and retrieving.

**FINGERPRINT FEATURES**—Unique physical characteristics of a fingerprint that are used to perform automated fingerprint searches.

**FINGERPRINT FEATURES MASTER FILE**—The set of all records on which fingerprint feature data exists.

**FINGERPRINT IMAGE**—A representative two-dimensional reproduction of the ridge detail of a fingerprint.

**FINGERPRINT MATCHER SCORE**—An AFIS-generated numerical score that indicates the approximate relationship between a latent print and an exemplar.

**FINGERPRINT MINUTIAE**—Unique identifying characteristics of fingerprints (e.g., beginning and ending points of ridges).

**FINGERPRINT MINUTIAE MATCHER**—The matching subsystem equipment that compares the minutiae data-based features of a search print with fileprints and selects the fileprint that comes closest to matching the search print. It will also perform a Minutiae Verification Match.

**FINGERPRINT MINUTIAE MATCHER ACCURACY**—1: A measure of the matcher subsystem’s ability either to identify the correct candidate as a result of the matching process or to report that no candidate is selected if the mate is not in the fileprint database being searched. 2: The closeness of agreement between the matcher subsystem’s generated representation of a fingerprint compared with the fingerprint it represents.

**FINGERPRINT MINUTIAE MATCHER RELIABILITY**—1: The probability that the mating fingerprint will be selected as the primary candidate by the matcher subsystem if that mate is in the fileprints being searched or that no candidate will be selected if the mate is not in the fileprints

being searched. 2: The probability that an entity will perform its intended functions for a specified interval under stated conditions.

**FINGERPRINT MINUTIAE MATCHER SELECTIVITY**—The function of selecting the candidate, both correct and incorrect, and its relationship to other close candidates based upon minutiae scoring algorithms within the matcher subsystem.

**FINGERPRINT PLAIN IMPRESSIONS**—Fingerprint impressions taken by simultaneously capturing all of the fingers of each hand and then the thumbs without rolling, using a pressed or flat impression. See also, *plain, touch, or flat impression*.

**FINGERPRINT REPOSITORY**—A term for the AFIS/Federal Bureau of Investigation capability to store fingerprint characteristics data and perform database-like functions, such as storage retrieval, search, and update. The AFIS/Federal Bureau of Investigation Segment has at least three subcategories of repository:

- (1) The *Federal Bureau of Investigation Criminal Repository* contains one entry for each subject meeting retention criteria. The data included are extracted from criminal ten-print submissions. At a minimum, the Federal Bureau of Investigation Criminal Repository contains fingerprint characteristics for all ten fingers.
- (2) The *Unsolved Latent Repository* contains single latent fingerprints not identified to any subject in the criminal fingerprint repository. It is used to provide leads for unsolved criminal cases.
- (3) The *Special Repositories* have separately defined uses and data. Each has its own sponsor who controls its use. The data in each repository may be used for either ten-print and latent fingerprint searching or for specially defined fingerprint searching.

**FINGERPRINT ROLLED IMPRESSIONS**—The impressions created by individually rolling each inked finger from side to side in order to obtain all available ridge detail. See also, *inked rolled print*.

**FAST FOURIER TRANSFER ALGORITHM**—An algorithm used in digital image processing to decompose and compose a signal.

**FLATS**—Fingerprint plain impressions. See also, *plain, touch, or flat impression*.

**FRICITION RIDGE**—1: The ridge-shaped skin on a finger or palm surface that makes contact with an object. 2: A raised portion of the epidermis on the palmar or plantar skin, consisting of one or more connected ridge units. (SWGFAST 2011)

**GRAY-SCALE IMAGE**—An image using more than two radiometric values, i.e., 256 shades of gray in an 8-bit image. Not a strictly black/white image.

**GROUP IV FAX**—A facsimile transmitted fingerprint card suitable for identification processing.

**HENRY CLASSIFICATION**—An alphanumeric system of fingerprint classification named after Sir Edward Richard Henry used for filing, searching, and retrieving ten-print records. (SWGFAST 2011)

**HIT RESPONSE** or **HIT ON FINGERPRINT SEARCH**—An identification of minutiae-based data of a fingerprint image with minutiae-based data from another fingerprint image as being a mate for the finger of the same person.

**INTEGRATED AUTOMATED FINGERPRINT IDENTIFICATION SYSTEM**—The Federal Bureau of Investigation's national AFIS. (SWGFAST 2011) IAFIS provides: (a) repository maintenance services, such as receipt, storage, and retrieval; (b) powerful search functions that attempt to match submitted fingerprints with fingerprints in the repository; and (c) fingerprint characteristics processing capability to derive unique aspects of fingerprints for storage and matching.

**INTERNATIONAL ASSOCIATION FOR IDENTIFICATION**—Professional association whose members are engaged in forensic identification, investigation, and scientific examination of physical evidence.

**IDENTIFICATION**—1: The positive match of a current ten-print or latent fingerprint card to a prior fingerprint card stored in the fingerprint files, made on a comparison of one set of fingerprints to another. 2: In some forensic disciplines, the similarity of class characteristics. (SWGFAST 2011) See also, *individualization*.

**INDIVIDUALIZATION**—The determination by an examiner that there is sufficient quality and quantity of detail in agreement to conclude that two friction ridge impressions originated from the same source. (SWGFAST 2011)

**IMAGE**—Processed or stored fingerprint images from a ten-print card or latent lift.

**INKED ROLLED PRINT**—An inked fingerprint impression taken by physically rolling the inked finger from side to side (nail to nail) on the fingerprint card stock. See also, *rolled impression*.

**INTEROPERABILITY**—The ability of two or more AFIS networks, systems, devices, applications or components to exchange information between them and to use the information so exchanged correctly and with minimal loss of accuracy.

**INTERPOL**—Originally the International Police Commission, established in 1923 with the first headquarters in Vienna, Austria. With the General Secretariat now in Lyon, France, Interpol focuses on international crimes that threaten public safety, especially those involving terrorism, criminal organizations, drugs, finances and technology, and trafficking in human beings, and provides fugitive investigative support.

**INTERSTATE IDENTIFICATION INDEX**—A national network for the exchange of criminal history records, which includes elements of participating state systems, the National Crime Information Center System, the Identification Automated Services of the Federal Bureau of Investigation, the National Law Enforcement Telecommunications Network, and the U.S. Postal Service, among other systems.

**IMAGE QUALITY SPECIFICATION**—Element of the Electronic Fingerprint Transmission Specification that has two components, Appendix F and Appendix G.

**JOURNAL OF FORENSIC IDENTIFICATION**—A publication of the International Association for Identification.

**JPEG**—1: An acronym for the Joint Photographic Experts Group. 2: A compression file format with the “.jpg” file extension, most of which use lossy compression.

**LATENT COGNIZANT DATABASE**—Fingerprint features records of all ten fingers of a subset of criminals in the ten-print database, used for matching latent fingerprint submissions, which may be partial fingerprints. Includes fingerprint data from certain crime categories (e.g., bank robbery or terrorism).

**LATENT PRINT**—1: Transferred impression of friction ridge detail not readily visible. 2: Generic term used for unintentionally deposited friction ridge detail. (SWGFAST) 3. The reproduction of the friction ridges on an item that is touched when the ridges come in contact with any contaminant.

**LATENT PRINT SUBMISSION**—A submission to the Federal Bureau of Investigation or other agency that contains a latent fingerprint search request accompanied by the latent fingerprint information, either electronic or hardcopy.

**LATENT PRINT LIFT**—1: A reproduction of the friction ridge detail of a latent print. 2: An adhesive or other medium used to transfer a friction ridge impression from a substrate. (SWGFAST 2011)

**LATENT PRINT SEARCH**—A comparison of the fingerprint features extracted from a latent fingerprint with the fingerprint features contained in a fingerprint features file to determine whether a latent fingerprint has a potential mate on file within the AFIS repository.

**LATENT PRINT SPECIALIST**—Law enforcement agency employee who performs latent print processing.

**LATENT PRINT SUBMISSION**—One image and associated descriptor data received by latent processing services, which may be part of a case.

**LAW ENFORCEMENT ONLINE**—National, interactive communications system maintained by the Federal Bureau of Investigation exclusively for law enforcement.

**LIGHTS OUT**—An AFIS search without any human intervention at Verification.

**LIVESCAN PRINT**—A fingerprint image that is produced by scanning a live finger with Livescan technology.

**LIVESCAN**—An electronic method of taking and transmitting fingerprints without using ink, which produces fingerprint impressions of high quality to perform identification processing.

**LOCAL MODE**—Process by which a workstation can perform some function independent of AFIS (function may be limited to acquisition of new records).

**LATENT/LATENT SEARCH**—A search of a latent print against other latent prints, which are usually stored in the Unsolved Latent File, and which has the potential to link crimes committed by same person, even though that person is as yet unidentified. Also referred to as a latent/unsolved latent search.

**LATENT/TEN-PRINT IDENTIFICATION DATABASE SEARCH**—A search of a latent print against the ten-print identification database.

**LATENT/TEN-PRINT LATENT COGNIZANT SEARCH**—A search of a latent print against the ten-print latent cognizant (ten-finger) database.

**LATENT/UNSOLVED LATENT SEARCH**—See latent/latent search.

**MASTER NAME INDEX**—A subject identification index maintained by criminal history record repositories that includes names and other identifiers for each person with a record in the database.

**MATCH**—Condition of retrieving a file subject that, because of matcher score, falls within selection criteria for the probability of a mate to a search suspect.

**MATCHER**—An AFIS component that compares the minutiae database features of a search print with fileprints and selects the fileprint that comes closest to matching the search print.

**MATCHER ACCURACY**—A measure of the matcher subsystem's ability to place the correct mates as the selected candidate as a result of the matcher process, or a measure of the matcher subsystem's ability to select no candidate if the mate is not in the database.

**MATCHER RELIABILITY**—1: The probability that the mate fingerprint will be selected as the primary candidate by the matcher if it is in the file being searched, or that no candidate will be

selected if the mate is not in the file being searched. 2: The probability that the matcher will function as intended for a specified interval under specific conditions.

**MATCHING SCORE**—The numerical result of comparing the minutiae data of two fingerprint digital representations.

**MATE**—1: A fingerprint that matches another impression from the same finger. 2: A fingerprint that is another impression from the same finger. (ANSI/IAI)

**MINUTIAE**—1: Friction ridge characteristics that are used to individualize the print and that occur at points where a single friction ridge deviates from an uninterrupted flow. Deviation may take the form of ending, dividing into two or more ridges, or immediately originating and terminating. (ANSI/IAI) 2: Events along a ridge path, including bifurcations, ending ridges, and dots (also known as Galton details). (SWGFAST)

**MINUTIAE DATA**—The data representing the relative position, orientation, and in some cases, the relationship and/or types of the minutiae in a fingerprint image. (ANSI/IAI)

**MINUTIAE SEARCHING**—The process of comparing the search print against the fileprints by scoring the match of minutiae data in the prints and ranking the scores either to produce one candidate with the highest score who is the potentially identical mate for the same finger, or to produce no candidate when the potentially identical print does not exist within the fingerprint database.

**MINUTIAE VERIFICATION MATCH**—The process of comparing minutiae data from a subject's previously entered single fileprint with minutiae data from a single incoming search print and, thereafter, comparing the resultant match score with a threshold to determine if the prints are potential mates.

**MATCHER QUALITY INDEX**—Value representing the sum of the “equivalent number of minutiae” for fingers 2 and 7 (generally the search fingers). The index is a complex metric that weights the actual minutiae count using local image quality and the number of neighbors in computation. On the average fingerprint, the Integrated Automated Fingerprint Identification System produces about 88 minutiae, and the average value for the equivalent number of minutiae is about 56. Images with higher matcher quality index values are more likely to be successfully matched by the Integrated Automated Fingerprint Identification System.

**NAIL-TO-NAIL ROLL**—See *rolled impression*.

**NAME SEARCH**—A routinely searched database program/file that can yield the State Identification Number of individuals in the database if they have used the same descriptive information for a prior event.

**NATIONAL CONSORTIUM FOR JUSTICE INFORMATION AND STATISTICS**—See *SEARCH*.

**NATIONAL CRIME INFORMATION CENTER**—A computer system established in 1967 to provide criminal record history, fugitives, missing persons, and stolen property information to local, state, and federal agencies. Succeeded by National Crime Information Center 2000.

**NATIONAL CRIME INFORMATION CENTER 2000**—Successor to National Crime Information Center, a network that provides information to local, state, and federal criminal justice agencies through computer terminals and mobile applications.

**NATIONAL FINGERPRINT FILE**—A component of the Interstate Identification Index that decentralizes interstate exchange of criminal history records by containing fingerprints from all federal offenders but only one first-arrest set of fingerprints from select state offenders with other biometric data, requiring states to maintain the criminal history.

**NATIONAL INCIDENT-BASED REPORTING SYSTEM**—An outgrowth of the uniform crime report and a byproduct of the state and local incident-based reporting systems, which collects specific crime information on 22 offense categories consisting of 46 specific crimes collectively called Group A offenses, including data on victims, offenders, and circumstances. For the 11 offensive categories known as Group B, only arrest information is captured.

**NATIONAL INSTANT CRIMINAL BACKGROUND CHECK SYSTEM**—A non-fingerprint-based search database accessible through the Internet and required before purchasing a firearm. Federal Firearms Licensees record descriptive information on the Bureau of Alcohol, Tobacco, Firearms and Explosives' Form 4473.

**NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY**—Formerly known as the National Bureau of Standards, this division of the U.S. Department of Commerce ensures standardization in non-defense government agencies.

**NEXT GENERATION IDENTIFICATION**—Program to advance the Federal Bureau of Investigation's biometric identification services, providing an incremental replacement of current Integrated Automated Fingerprint Identification System technical capabilities, while introducing new functionality across a multi-year timeframe.

**NLETS**—An outgrowth of Law Enforcement Teletype System, Nlets was incorporated in 1970 as a not-for-profit organization. Nlets provides an international, computer-based message system that links local, state, and federal criminal justice agencies for information exchange and provides information services support for justice-related applications by supporting data communications links to state networks using commercial relay services.

**NON-IDENTIFICATION**—A determination that two fingerprints do not belong to a particular person or that no mate is found as the result of a fingerprint comparison.

**ORIGINATING AGENCY IDENTIFIER**—An identification number assigned by the National Crime Information Center or the Integrated Automated Fingerprint Identification System to each

agency that may submit information into, or receive information from, either system. The format of this number varies from agency to agency, except that the first two characters always designate the state, territory, province, or country of the contributor.

**PALM PRINT**—1: An inked and rolled or Livescan of the palms of both hands. May also include the side of the hand referred to as the writers palm. 2: An impression of the friction ridges of all or any part of the palmar surface of the hand. (SWGFAST 2011)

**PATTERN CLASSIFICATION**—Characterization of a fingerprint as containing one of seven fingerprint patterns: arch, tented arch, right-slant loop, left-slant loop, whorl, amputation, or scar. The Integrated Automated Fingerprint Identification System will provide for both pattern-level and Henry classifications.

**PROCESS CONTROL NUMBER**—A temporary identifier of a ten-print record until matching State Identification Number is found (by locating a match in the database) or a new State Identification Number is assigned (if there is no match on the database).

**PEAK MINUTE**—A minute during which a system must process a statistically significantly greater number of user support functions than it is required to process during an average minute.

**PIXEL**—The smallest element of a picture that is digitized as an entity. (ANSI/IAI)

**PLAIN, TOUCH, OR FLAT IMPRESSION**—Impressions of all four fingers from each hand, taken simultaneously, and of the thumbs, taken without rolling, which appear at the bottom of the fingerprint card and serve to verify the proper sequence of the rolled (or Livescan) impressions and to provide additional ridge detail for comparison. (ANSI/IAI)

**PROTOTYPE**—A simulation of a program, report, menu, or system.

**QUALITY CONTROL**—1: Editing of fingerprint minutiae to improve accuracy for identification, automatically determined for ten-prints. 2: Measures that are taken to ensure that an acceptable level of system performance is maintained. (ANSI/IAI)

**RADIOMETRIC RESOLUTION**—Number of intensity levels (i.e., shades of gray or color values) in a digital image.

**RELAUNCH**—Searching a latent print case after the initial latent/ten-print latent cognizant database search using different search parameters while maintaining the same case identifiers and images.

**RELIABILITY**—The probability that the mating fingerprint will be a candidate if the mate is in the file being searched.

**REMOTE TEN-PRINT FINGERPRINT FEATURE SEARCH (NATIVE MODE)**—A search request transmitted to the Federal Bureau of Investigation originating outside the Identification Tasking and Networking workstations containing fingerprint characteristics derived by an AFIS in a similar manner to those derived by the Integrated Automated Fingerprint Identification System and containing the necessary fingerprint classifications and other data. The search request is performed automatically by the Integrated Automated Fingerprint Identification System without human involvement.

**REVERSE SEARCH**—See *ten-print/unsolved latent search*.

**REMOTE FINGERPRINT EDITING SOFTWARE**—Software package from the Federal bureau of Investigation to perform remote searches on the Integrated Automated Fingerprint Identification System, which supports remote Integrated Automated Fingerprint Identification System transactions including image- and features-based searches for latent and ten-print applications. Succeeded by Universal Latent Workstation.

**ROLLED IMPRESSION**—Fingerprint impressions created by individually rolling each finger from side to side (nail to nail) to obtain all available friction ridge detail. The images appear in the individual print boxes on the ten-print card.

**SCANNER**—Capture device to create a digital image. New scanners that connect to the Federal Bureau of Investigation must meet the standards outlined in Appendix F of the *Electronic Biometric Transmission Specification*.

**SEARCH SELECTIVITY**—The total number of incorrect candidates divided by the total number of searches conducted during the time period; that is, it is the number of incorrect candidates, averaged over time periods, produced for comparison per search at the operating point at which search reliability is measured.

**SEARCH** or **THE NATIONAL CONSORTIUM FOR JUSTICE INFORMATION AND STATISTICS**—A nonprofit membership organization dedicated to better criminal justice information management, effective identification technology, and responsible law and policy.

**SEGMENT**—One of the constituent parts into which an automated system may be logically divided.

**STATE IDENTIFICATION NUMBER**—Number assigned to each individual on a state file.

**SUBJECT MATTER EXPERT**—Person who exhibits the highest level of expertise in performing a specialized job, task, or skill.

**STATEMENT OF WORK**—Describes the tasks and responsibilities for a project.

**SPATIAL RESOLUTION**—Relationship of the individual pixels to the size of the actual area represented.

**SPECTRAL RESOLUTION**—Color bands of light detected during image acquisition.

**STATE-OF-THE-ART TECHNOLOGY**—The highest level of development of a device or technique achieved at any particular time.

**STORE AND FORWARD**—A system capable of electronically receiving and processing fingerprint cards at the state and then sending the fingerprints electronically into AFIS and to the Federal Bureau of Investigation.

**SUBJECT SEARCH**—A search, using biographical and/or physical data, to identify a list of candidates having records that match the descriptors specified; can be based upon name, gender, date of birth, Federal Bureau of Investigation Number, State Identification Number, Social Security Number, or other biographical or physical data (e.g., height, weight, age) or combinations of these characteristics.

**SCIENTIFIC WORKING GROUP ON FRICTION RIDGE ANALYSIS, STUDY AND TECHNOLOGY**—A group of local, state, and federal law enforcement officials and members of the community who establish guidelines for the development and enhancement of friction ridge examiners' knowledge, skills, abilities, methods, and protocols; who establish guidelines for quality assurance; and who cooperate with national and international standards organizations to disseminate their findings.

**TERMINAL AGENCY COORDINATOR**—Individual in the control terminal agency who is responsible for monitoring system use, enforcing system discipline, and ensuring National Crime Information Center operating procedures are followed.

**TECHNICAL SEARCH**—Using AFIS, a minutiae-based fingerprint search, usually with the index fingerprints of the ten-print record but sometimes with the thumbs or a combination of index fingers and thumbs.

**TEN-PRINT**—A fingerprint card (or fingerprint card equivalent) containing rolled and plain impressions from the ten fingers of an individual. The standard format contains 14 impressions: one rolled fingerprint impression of each finger, plain fingerprint impressions of each thumb, and plain impressions of the four fingers of each hand simultaneously.

**TEN-PRINT CARD SUBMISSION**—A fingerprint card submitted to the Federal Bureau of Investigation by mail, facsimile, or other electronic method for the purpose of identification and possible incorporation into the Federal Bureau of Investigation's Fingerprint Repository.

**TEN-PRINT IMAGE SEARCHES**—An electronic transaction submitted to the Federal Bureau of Investigation, which contains fingerprint images, classification information as required by the

Integrated Automated Fingerprint Identification System, or remotely extracted fingerprint characteristics. The subsequent search will be conducted automatically with no additional manual editing or processing. If candidates are identified, the candidates' Federal Bureau of Investigation Numbers are returned to the transmitting agency along with fingerprint images from the highest scoring candidates.

**TAGGED IMAGE FILE FORMAT**—An image file format with the “.tif” file extension, which can be either lossless or lossy.

**TEN-PRINT/TEN-PRINT IDENTIFICATION DATABASE SEARCH**—Search of a ten-print record against the records in the ten-print identification database.

**TEN-PRINT/UNSOLVED LATENT SEARCH**—Search of a new ten-print record against the records in the unsolved latent file in expectation that the owner of the latent print did not have a record in the ten-print database at the time of the latent/ten-print search. Also referred to as a reverse search.

**TEN-PRINT IDENTIFICATION DATABASE**—Database consisting of two finger images, usually the index fingers but sometimes the thumbs.

**TEN-PRINT LATENT COGNIZANT DATABASE**—Database consisting of all ten finger images, which may be a subset of the ten-print identification database.

**TRANSPOSITION**—Incorrect position of hands on the ten-print card (e.g., images of the right hand appear in boxes for the left hand). In the past, identification staff would visually inspect the rolled impressions against the plain impressions for consistency. Livescan software for extraction and comparison reduce this burden on digitally retrieved images.

**TECHNOLOGY WITHOUT AN IMPORTANT NAME**—Image acquisition and output protocol commonly used between computers, printers, and image capture devices.

**UNIFORM CRIME REPORT**—Voluntary reporting of crimes (including murder, non-negligent manslaughter, forcible rape, robbery, aggravated assault, burglary, larceny-theft, motor vehicle theft, and arson) to the Federal Bureau of Investigation's Criminal Justice information Services Division.

**UNSOLVED LATENT/UNSOLVED LATENT SEARCH**—A search of the unsolved latent print file using another unsolved latent print to determine if latent images from the same subject are on file even if the subject remains unknown. May be used to determine a serial offender and for sharing information with another agency.

**UNIVERSAL LATENT WORKSTATION**—Software program developed by the Federal Bureau of Investigation's Criminal Justice information Services Division that, when installed on a commercial off-the-shelf computer, allows the operator to create a native feature set for AFIS

vendors by which the Integrated Automated Fingerprint Identification System can receive and search an ANSI/NIST-formatted record.

**UPGRADE**—Introduction of new software and/or hardware into an existing system. The upgrade may be to fix certain known problems unique to one AFIS customer, to fix known problems applicable to all customers, to provide an improvement to the AFIS system not related to a problem, or to enable a move to a new platform (such as from Microsoft® Windows® to Linux, or Windows® 98 to Windows® XP). The upgrade may require extensive on-site testing prior to installation on the live system.

**VALIDATION**—Process of comparing data or images against a previously verified set of data; a double check of the verification that confirms the accuracy of a system prior to use.

**VERIFICATION**—1: Process of visually comparing a search fingerprint with a candidate fingerprint to determine if there is a match after another latent print examiner has already reached a conclusion. 2: The fourth and final step in the ACE-V process.

**WIDE AREA NETWORK**—A network that interconnects geographical entities, such as cities and states, generally covering a distance of 50 miles or greater.

**WAVELET SCALAR QUANTIZATION**—A lossy compression algorithm used to reduce finger or palm print images size.



## Attachment I: Acronym List

DRAFT

ABIS—Automated Biometric Identification System  
AFIS—Automated Fingerprint Identification System  
ANSI—American National Standards Institute  
APB—Advisory Policy Board  
ARG—Attributed Relational Graph  
ASCII—American Standard Code for Information Interchange  
ATB—Automated Fingerprint Identification System Test Bed  
BCI&I—Bureau of Criminal Identification and Investigation  
BoM—Bill of Material  
CAN—Criminal Ten-Print Submission (No Answer Necessary)  
CAR—Criminal Ten-Print Submission (Answer Required)  
CARC—Criminal Ten-Print Card Scanning Service Submission (Answer Required)  
CAXI—Core and Axis Independent  
CCD—Charged-Coupled Device  
CCH—Computerized Case History or Computerized Criminal History  
CJIS—Criminal Justice Information Services  
CLPE—Certified Latent Print Examiner  
CMF—Criminal Master File  
CNAC—Criminal Ten-Print Card Scanning Service Submission (No Answer Necessary)  
CODIS—Combined DNA Index System  
CONOPS—Concept of Operations  
COTS—Commercial Off-the-Shelf  
CSS—Card Scanning Service  
CTA—Control Terminal Agency  
DCJS—New York State Division of Criminal Justice Services  
DEU—Unknown Deceased  
DIRS—Digital Image Retrieval System  
DMS—Data Management System  
DNA—Deoxyribonucleic Acid  
DPS—Department of Public Safety  
EBTS—Electronic Biometric Transmission Specification  
EFCON—Electronic Fingerprint Converter  
EFTS—Electronic Fingerprint Transmission Specification  
EFS—Extended Feature Set  
FANC—Federal Applicant – No Charge Federal Agency Name Check  
FAR—False Acceptance Rate  
FAT—Factory Acceptance Test  
FAUF—Federal Applicant User Fee  
FBI—Federal Bureau of Investigation  
FFT—Fast Fourier Transfer  
FIC—Fingerprint Image Comparison  
FIMF—Fingerprint Image Master File  
FNCC—Federal Applicant Card Scanning Service Submission (No Charge)

FNU—Federal Bureau of Investigation Number  
FPF—Focal Point Filtering  
FPT—Fast Fourier Number  
FpVTE—Fingerprint Vendor Technology Evaluation  
FUFC—Federal Applicant Card Scanning Service Submission (User Fee)  
GFE—Government-Furnished Equipment  
IAFIS—Integrated Automated Fingerprint Identification System  
IAI—International Association for Identification  
IBR—Incident-Based Reporting  
ICD—Interface Control Document  
IDAS—Identification Automated Services of the Federal Bureau of Investigation  
III—Interstate Identification Index  
IISS—Identification and Investigative Services Section of Criminal Justice Information Services Division  
IMAP—Internal Miscellaneous Applicant Civil  
IQS—Image Quality Specification  
IRC—Indeterminate Ridge Count  
IT—Information Technology  
ITL—Information Technology Laboratory  
ITN—Identification Tasking and Networking  
JFI—Journal of Forensic Identification  
JPEG—Joint Photographic Experts Group  
LDIS—Local DNA Index System  
LEIF—Law Enforcement Interconnecting Facilities  
LEO—Law Enforcement Online  
LETS—Law Enforcement Teletype System  
LFFS—Latent Fingerprint Feature Search  
LFIS—Latent Fingerprint Image Search  
LITS—Latent Interoperability Transmission Standard  
LT—Latent Print  
LT-ARG—Latent-Attributed Relational Graph  
MAP—Miscellaneous Applicant Civil  
MAPC—Miscellaneous Applicant Card Scanning Service Submission (No Charge)  
MCAXI—Modular Core and Axis Independent  
MCS—Minutiae Comparison Standard  
MOU—Memorandum of Understanding  
MPR—Missing Person  
MQI—Matcher Quality Index  
N-FACS—National Fingerprint-Based Applicant Check Study  
NCIC—National Crime Information Center  
NCIC 2000—National Crime Information Center 2000  
NDIS—National DNA Index System  
NFF—National Fingerprint File  
NFFC—Non-Federal Applicant Card Scanning Service Submission (User Fee)

NFUF—Non-Federal Applicant User Fee  
NGI—Next Generation Identification  
NIBRS—National Incident-Based Reporting System  
NICS—National Instant Criminal Background Check System  
NIJ—National Institute of Justice  
NIST—National Institute of Standards and Technology  
NOE—Non-Operational Environment  
NPS—National Police Services  
NSOR—National Sex Offender Registry  
NYSIIS—New York State Identification and Intelligence System  
O&M—Operations and Maintenance  
ODRC—Ohio Department of Rehabilitation and Correction  
OE—Operational Environment  
OLES—Law Enforcement Standards Office  
ORI—Originating Agency Identifier  
PC/RC—Pattern Class/Ridge Count  
PCN—Process Control Number  
POC—Point of Contact  
PPI—Pixels per Inch  
PSS—Public Safety Strategy  
QC—Quality Control  
RFES—Remote Fingerprint Editing Software  
RFI—Request for Information  
RFP—Request for Proposals  
RRI—Repository Retrieval Index  
SAN—Storage Area Network  
SAT—Site Acceptance Test  
SDIS—State DNA Index System  
SID—State Identification  
SME—Subject Matter Expert  
SMT—Scars, Marks, and Tattoos  
SoS—System-of-Systems  
SOW—Statement of Work  
SP/CR—System Problem/Change Report  
SSN—Social Security Number  
SWGFAST—Scientific Working Group on Friction Ridge Analysis, Study and Technology  
TAC—Terminal Agency Coordinator  
TAR—True Acceptance Rate  
TBD—To Be Determined  
TIFF—Tagged Image File Format  
TOT—Type of Transaction  
TP—Ten-Print Record  
TP-CMF-CAXI—Ten-Print Criminal Master File Core and Axis Independent  
TP-ARG—Ten-Print-Attributed Relational Graph

TPid—Ten-Print Identification Database  
TPIS—Ten-Print Image Search  
TPIC—Ten-Print Latent Cognizant Database  
TWIN—Technology Without an Important Name  
UCR—Uniform Crime Report  
UL—Unsolved Latent  
ULF—Unsolved Latent File  
ULW—Universal Latent Workstation  
UP—Unsolved Palm  
USSS—United States Secret Service  
VPN—Virtual Private Network  
WAN—Wide Area Network  
WDS—Workflow Distribution Server  
WIN—Western Identification Network  
WSQ—Wavelet Scalar Quantization

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