

SWGFAST

Friction Ridge Automation Training Guidelines

1. Automation Training for Latent Print Examiners/Trainees

Latent Print Examiners/Trainees working with friction ridge automation should receive training that provides sufficient knowledge and skills necessary to understand friction ridge automation technology. This training should address friction ridge skin impressions recorded and processed digitally.

1.1 Qualifications

- 1.1.1 Latent Print Examiners/Trainees need knowledge, skills and the ability to recognize identifiable friction ridge detail before automation training.
- 1.1.2 Instructors must possess the knowledge, skills, and abilities for the courses being instructed.

1.2 Live Scan

- 1.2.1 Required objectives - Knowledge of live scan technology and how it differs from other methods of recording known friction ridge impressions, e.g., ink, inkless. The ability to recognize live scan generated artifacts and understand their cause and effect relative to friction ridge examinations.
 - 1.2.1.1 Theory of operation - Understand how friction ridge detail on three dimensional skin is digitally captured as a two dimensional image.
 - 1.2.1.2 Quality issues - Understand the process needed to achieve good quality friction ridge images, e.g., clean fingers, clean platen, proper rolling speed and movement, scan resolution, compression rate, equipment maintenance and calibration. Understand quality controls that ensure completeness, image quality and data integrity.
 - 1.2.1.3 Electronic transfer - Understand what happens to the digital image file after capture.
 - 1.2.1.3.1 Electronic transmission standards - Knowledge of ANSI/NIST, IAFIS EFTS, and local standards for exchanging friction ridge records.
 - 1.2.1.4 Information and image integrity - Awareness of data authentication mechanisms, e.g., encryption, compression, and network security.
- 1.2.2 Supplemental objectives:

- 1.2.2.1 Operation of equipment - Knowledge of live scan operator activities, e.g., booking officer techniques, exception handling (amputations, bandaged, etc.), moisturizing lotion, and rescans.
- 1.2.2.2 Equipment maintenance and calibration frequency, i.e., who does it, how often, and where it is documented.
- 1.2.2.3 Operator training - understanding of live scan operator training, i.e., who conducts the training, how often, and where it is documented.

1.3 Card Scan

- 1.3.1 Required objectives - Knowledge of card scan technology and how it captures, processes, stores and reproduces known friction ridge impressions, e.g., ink, inkless. The ability to recognize card scan generated artifacts and understand their cause and effect relative to friction ridge examinations.
 - 1.3.1.1 Theory of operation - Understand the recording medium on the paper document and how known friction ridge impressions are captured as digital images.
 - 1.3.1.2 Quality issues - Understand the process needed to achieve good quality friction ridge digital images, e.g., clean platen, scan resolution, compression rate, equipment maintenance and calibration. Understand quality controls that ensure completeness, image quality and data integrity.
 - 1.3.1.3 Electronic transfer - Understand what happens to the digital image file after capture.
 - 1.3.1.3.1 Electronic transmission standards - Knowledge of ANSI/NIST, IAFIS EFTS, and local standards for exchanging known friction ridge impressions.
 - 1.3.1.4 Information and image integrity - Awareness of data authentication mechanisms, e.g., encryption, compression, and network security.
- 1.3.2 Supplemental objectives:
 - 1.3.2.1 Operation of equipment - Knowledge of card scan operator activities, e.g., booking officer techniques, exception handling (amputations, bandaged, etc.), and rescans.
 - 1.3.2.2 Equipment maintenance and calibration frequency, i.e., who does it, how often, and where it is documented.
 - 1.3.2.3 Operator training - knowledge of card scan operator training, i.e., who conducts the training, how often, and where it is documented.

1.4 Automated Fingerprint Identification System (AFIS)

The term AFIS as used herein includes automated systems for any friction ridge area, e.g., palmprints.

1.4.1 Required objectives related to Ten Print operations - Knowledge of AFIS processes related to acquisition, classification, searching, storage, retrieval, and identification of ten print records.

1.4.1.1 Theory of operation - Knowledge of AFIS procedures as an end-to-end process; e.g., capture through final reporting and storage.

1.4.1.1.1 Knowledge of which friction ridge areas, e.g., how many fingers, which fingers, palms, are used for searching and matching.

1.4.1.2 Quality issues - Understand the importance quality assurance has on maintaining the integrity of friction ridge data. Understand quality controls which ensure completeness, image quality and data integrity.

1.4.1.2.1 Knowledge of system requirements and limitations including text data fields, finger or palm print (image) quality, finger sequence and image replacement, image rotation, and tolerance for pattern interpretation.

1.4.1.2.2 Knowledge of system and component maintenance and calibration, i.e., who does it, how often, and where it is documented.

1.4.1.2.3 Knowledge of image, minutiae and text records association.

1.4.1.3 AFIS Minutiae - Knowledge of the basic concepts associated with minutiae recognition, placement, rotation, ridge counts and other minutiae factors related to searching and matching.

1.4.1.4 AFIS compatibility issues - Knowledge that some systems cannot interchange files.

1.4.1.5 Electronic transmission standards - Knowledge of ANSI/NIST, IAFIS EFTS, and local standards for exchanging known friction ridge impressions.

1.4.2 Supplemental objectives:

1.4.2.1 Operation of equipment - Understand procedures used for processing ten print records.

- 1.4.2.2 System Integration - Understand the integration of friction ridge image, mugshot, tattoo/scar/mark image, minutiae, personal descriptor and criminal history files.
- 1.4.3 Required objectives for Latent Prints - Knowledge of AFIS processes related to classification, searching and matching of latent prints (fingerprints and palm prints).
 - 1.4.3.1 Theory of operations - Knowledge of AFIS text data filtering, pattern classification and referencing, minutiae extraction, searching, comparison, threshold scoring, candidate list comparison and matching.
 - 1.4.3.2 System capabilities - Understand latent print v. ten print, ten print v. latent print, latent print v. latent print, ten print v. ten print, and palm print v. palm print search capabilities of the AFIS.
 - 1.4.3.3 Encoding - Understand how to manually or automatically position latent print minutiae to emulate the system's automated minutiae extraction.
 - 1.4.3.4 Pattern Interpretation - Understand automated classification and how to interpret latent prints in a similar manner.
 - 1.4.3.5 Progression - Understand logical search progression, i.e., local AFIS first, then state, regional, national and international.
 - 1.4.3.6 File penetration - Understand the benefits and liabilities of partial versus full database searches.
 - 1.4.3.6.1 Search logic - Understand filtering criteria used to establish logical candidates, i.e., finger position, sex, classification, race, offense, geographic location, etc.
 - 1.4.3.6.2 Candidate list - Understand the search result contents, e.g., ranked order, unique identifier, finger or palm position. Understand the need to ensure that candidates meet the search criteria.
 - 1.4.3.6.3 Score - Understand the significance of the candidate scores, candidate thresholding, the meaning of differential scores between candidates, etc.
 - 1.4.3.7 On screen examination - Understand the differences between on screen images and original friction ridge impressions, e.g., magnification of original impressions can show more detail but digital images can never exceed original capture resolution; monitor resolution may prevent pixel for pixel display.

- 1.4.3.8 Hard copy examination - Understand printer technology limitations versus examinations from original friction ridge documents, e.g., inked fingerprint cards.
- 1.4.3.9 Record authentication - Understand the processes for authentication, e.g., correct association of name, unique identifier, friction ridge images and criminal history record.

1.5 Digital Imaging

- 1.5.1 Required objectives - Knowledge of digital imaging procedures related to friction ridge impression capture, processing, storage, retrieval, transmission and display.
 - 1.5.1.1 Historical development and legal precedents
 - 1.5.1.2 Image file formats, e.g., bmp, tif, jpg
 - 1.5.1.3 Compression, e.g., wsq, jpg
 - 1.5.1.4 Image resolution, e.g., spatial, radiometric, spectral
 - 1.5.1.5 Image processing, e.g., sharpening, FFT, histogram equalization
 - 1.5.1.6 Equipment maintenance and calibration, i.e., who does it, how often, and where it is documented.
 - 1.5.1.7 SWGFAST Friction Ridge Impression (Latent Print) Digital Image Guidelines