FACIAL IDENTIFICATION

Glossary of Terms

2018

CONTENTS

INTRODUCTION

The purpose of this glossary is to promote consistent use of facial identification terminology among the key stakeholder agencies of the Australia New Zealand Policing Advisory Agency National Institute of Forensic Science (ANZPAA NIFS).

Terms in this document are broken up into three categories. *Business Areas* to cover bodies and groups involved in facial identification, *Key Facial Identification Terms*, and finally relevant international *Standards Terms*.

This document was prepared by a working group as part of the ANZPAA NIFS Facial Identification Project. For more information about the ANZPAA NIFS work program please visit www.nifs.org.au.

BUSINESS AREAS

Key groups involved in facial identification research, testing, standards, application and best practice.

BUSINESS AREAS	ACRONYM	MEANING	REFERENCE
Australian Intelligence Community	AIC	Agencies who are members of the Australian Intelligence Community.	
Australia New Zealand Policing Advisory Agency	ANZPAA	Established in October 2007, ANZPAA is a joint initiative of Australian and New Zealand Police Commissioners (ANZPAA's Board). In the role of forecaster, advisor and facilitator we proactively partner with police jurisdictions to identify opportunities for improved performance that results in better community safety outcomes in Australia and New Zealand. ANZPAA is comprised of three directorates: Strategic Services, Corporate Services, and the National Institute of Forensic Science (NIFS).	http://www.anzpaa.org.au

BUSINESS AREAS	ACRONYM	MEANING	REFERENCE
Australia New Zealand Policing Advisory Agency National Institute of Forensic Science	ANZPAA NIFS	The National Institute of Forensic Science is a directorate within the Australian and New Zealand Policing Advisory Agency (ANZPAA NIFS). Founded in 1992, NIFS strategic intent is to Promote and Facilitate Excellence in Forensic Science. The NIFS Strategic Plan is approved by the ANZPAA Board of Police Commissioners and overseen by the Australia New Zealand Forensic Executive Committee (ANZFEC) through delivery of its business plan. ANZFEC member agencies are the government forensic service providers in Australia and New Zealand.	http://www.anzpaa.org.au/forensic-science/about
Biometrics Institute (Australia)	BI	The Biometrics Institute was founded in July 2001 responding to an industry need for an independent and impartial international forum for the sharing of knowledge and information about biometrics and to provide best-practice guidance around the responsible use of biometrics. It acts as a facilitator in the growth of the industry, delivering quality service, while promoting the responsible use of biometrics.	http://www.biometricsinstitute.org
European Network of Forensic Science Institutes - Digital Image Working Group	ENFSI-DWIG	The Expert Working Groups (EWGs) of ENFSI are mandated to produce best practice manuals (BPMs) in their relevant fields of expertise. The ENFSI Digital Imaging Working Group (DIWG) is conducting preliminary research into the creation of a BPM in facial image comparison and the initial action of this research was to conduct a survey of current working practices from facial image examiners, to gauge the current state of the art. This report summarises the results of that survey, identifies trends in workflows and highlights disparate areas in working practices.	http://enfsi.eu/about-enfsi/structure/working-groups/digital-imaging/

BUSINESS AREAS	ACRONYM	MEANING	REFERENCE
Facial Biometrics Centre of Expertise **(Australia)**	FABCOE	Formed in 2012 by the Commonwealth Attorney Generals Department. The role of the Facial Biometrics Centre of Expertise is to promote information sharing, collaboration and best practice approaches among Australian Government agencies employing facial biometrics technologies, in order to enhance the interoperability of facial biometric information and systems, consistent with the Australian Government Biometrics Interoperability Framework.	FABCOE Terms of Reference
Facial Identification Scientific Working Group **(USA)**	FISWG	Since the early 1990s, American and International forensic science laboratories and practitioners have collaborated in Scientific Working Groups* (SWGs) to improve discipline practices and build consensus standards. FISWG formed in 2009 with support from the US Federal Bureau of Investigation, to gather and disseminate accurate information regarding the proper application of FI and FR methodologies and technologies. Since 2014, most SWGs function in a collaborative and supporting role to the Office of Scientific Area Committees (OSAC) for Forensic Science.	https://fiswg.org/about_swgs.html https://fiswg.org/index.htm
Facial, Aptitude, Competency, Error, Testing (Group) **(Australia)**	FACET	Working group of FABCOE. The aim of the FACET Group is to establish national definitions and a set of strong foundations for best practice guidelines and methodologies, for the testing and assessment of human performance in facial recognition or comparison.	FACET Group Final Report
INTERPOL	INTERPOL	INTERPOL is the world's largest international police organisation, with 190 member countries. Its role is to enable police around the world to work together to make the world a safer place. Its high-tech infrastructure of technical and operational support helps meet the growing challenges of fighting crime in	https://www.interpol.int/en

		the 21st century.	
		INTERPOL works to ensure that police around the world have access to the tools and services necessary to do their jobs effectively. It provides targeted training, expert investigative support, relevant data and secure communications channels.	
		This combined framework helps police on the ground understand crime trends, analyse information, conduct operations and, ultimately, arrest as many criminals as possible.	
		INTERPOLs face recognition system went online in November 2016.	
National Institute of Standards and Technology **(USA)**	NIST	The National Institute of Standards and Technology (NIST) falls under the US Department of Commerce. It has primary responsibility to coordinate development of a quality infrastructure for forensic science standards development. It also undertakes the testing of biometric systems including facial recognition.	https://www.nist.gov/programs-projects/face-recognition-vendor-test-frvt https://www.nist.gov/programs-projects/face-video-evaluation-five http://nvlpubs.nist.gov/nistpubs/ir/2017/NIST.IR.8173.pdf
		Face Recognition Vendor Tests (FRVT) provide independent government evaluations of commercially available and prototype facial recognition technologies. These evaluations are designed to provide U.S. Government and law enforcement agencies with information to assist them in determining where and how facial recognition technology can best be deployed. In addition, FRVT results help identify future research directions for the face recognition community.	
		The latest 2016 test was the Face in Video Evaluation (FIVE) being conducted to assess the capability of face recognition algorithms to correctly identify or ignore persons appearing in video sequences.	

BUSINESS AREAS	ACRONYM	MEANING	REFERENCE
Organization of Scientific Area Committees (USA)	OSAC	The Organization of Scientific Area Committees (OSAC) for Forensic Science works to strengthen the US nation's use of forensic science by facilitating the development of technically sound forensic science standards and by promoting the adoption of those standards by the forensic science community. These standards are written documents that define minimum requirements, best practices, standard protocols, and other guidance to help ensure that the results of forensic analysis are reliable and reproducible. OSAC is administered by the National Institute of Standards and Technology (NIST), but the great majority of its more than 550 members are from other government agencies, academic institutions, and the private sector. These members have expertise in twenty-five specific forensic disciplines, as well as general expertise in scientific research, measurement science, statistics, law, and policy. OSAC members work together to develop and evaluate forensic science standards via a transparent, consensus-based process that allows for participation and comment by all stakeholders. The OSAC Facial Identification Sub-committee is the peak USA group for Facial Identification.	https://www.nist.gov/topics/forensic-science/about-osac https://www.nist.gov/topics/forensic-science/organization-scientific-area-committees-osac
Training Standards Working Group (Australia)	TSWG	TSWG sits as a working group under FABCOE. Its main project has been to develop the National Facial Comparison Training Framework (August 2015) which identifies the roles, training, knowledge and competencies for facial identification.	TSWG Terms of Reference

BUSINESS AREAS	ACRONYM	MEANING	REFERENCE
Unfamiliar Facial Identification Group **(Australia)**	UFIG	An annual meeting organised by the University of New South Wales for the presentation of legal and research issues as they relate to facial recognition.	http://forensic.psy.unsw.edu.au/ufig.html

FACIAL IDENTIFICATION TERMS

Key concepts and methods used in facial identification research, testing, standards, application and best practice.

FACIAL IDENTIFICATION TERMS	ACRONYM	MEANING	REFERENCE
Face In A Crowd	FIAC	Real-time or post-event facial recognition in which imagery (usually video) is processed to find faces and biometrically match them with watchlist(s) of persons, to alert users to their presence. Capture locations are usually uncontrolled environments to assist with security and protection.	USA National Institute of Standards and Technology (NIST) Face In Video Evaluation (FIVE)
Facial Comparison	FC	The generic term to cover all human manual comparisons of faces (and images of faces), either for intelligence or forensic outcomes.	https://fiswg.org/FISWG_GuidelinesforFacialComparisonMethods_v1.0_2012_02_02.pdf
Facial Identification	FI	A comprehensive term to cover all use of faces by biometric, human comparison and forensic processes for the identification of people.	www.fiswg.org
Facial Image Comparison	FIC	Facial image (human) comparison is used to identify living people from still images or CCTV footage. The preferred approach is morphological analysis of the facial features and proportional comparison to provide a level of support for identity.	www.fiswg.org
Facial Image Examiner	FIE	Performs a rigorous one-to-one analysis, comparison and evaluation of controlled and uncontrolled images for the purpose of effecting a conclusion.	FISWG, Recommendations for a training program in facial comparison, version 1.0, issue date: 02-02-2012 Face recognition accuracy of forensic examiners, superrecognizers and face recognition

FACIAL IDENTIFICATION TERMS	ACRONYM	MEANING	REFERENCE
			algorithms
			P. Jonathon Phillips, Amy N. Yates, Ying Hu, Carina A. Hahn, Eilidh Noyes, Kelsey Jackson, Jacqueline G. Cavazos, Géraldine Jeckeln, Rajeev Ranjan, Swami Sankaranarayanan, Jun-Cheng Chen, Carlos D. Castillo, Rama Chellappa, David White, and Alice J. O'Toole PNAS May 29, 2018. 201721355; published ahead of print May 29, 2018. https://doi.org/10.1073/pnas.1721355115
			1. Edited by Thomas D. Albright, The Salk Institute for Biological Studies, La Jolla, CA, and approved April 30, 2018 (received for review

FACIAL IDENTIFICATION TERMS	ACRONYM	MEANING	REFERENCE
			December 13, 2017)
			http://www.pnas.org/content/early/2018/05/22/1721355115.short
Facial Image Reviewer	FIR	Evaluates one-to-many galleries either manually or with the assistance of an automated facial recognition system. This can be done either in an investigative capacity, where there may be further information available, or in an actionable capacity, where an action may be taken based directly on this review.	FISWG, Recommendations for a training program in facial comparison, version 1.0, issue date: 02-02-2012
Facial Mapping		(1) The process of land marking defined anthropological points. (2) A colloquial term often mistakenly used to describe facial comparison.	FISWG Section 6 0 Guidelines for Facial Comparison Methods https://fiswg.org/FISWG_GuidelinesforFacialComparisonMethods_v1.0_2012_02_02.pdf
Facial Recognition (Memory & Machines)	FR	**In Automated Systems / Biometric Systems** The automated searching of a facial image in a biometric database (one-to-many), typically resulting in a group of facial images ranked by computer-evaluated similarity. **By Humans** The mental process by which an observer identifies a person as being one they have seen before.	https://www.fiswg.org/FISWG_Glossary_v1.1_2012_02_02.pdf
Familiar Face Recognition		Familiar faces are those to which we have previously been exposed to (e.g. Family, friends, famous faces).	Department of Defence, Defence Science and Technology, Human Bias Course "Facial Image

FACIAL IDENTIFICATION TERMS	ACRONYM	MEANING	REFERENCE
			Comparison: What Does the Research Say."
Unfamiliar Face Recognition		Unfamiliar faces are those previously unseen, or seen for too brief a period to form a stable representation in memory.	Department of Defence, Defence Science and Technology, Human Bias Course "Facial Image Comparison: What Does the Research Say."
Forensic Facial Image Examiner	FFIE	Forensic Facial Image Examination is a FIE for court.	Forensic Facial Identification: Theory and Practice of Identification from Eyewitnesses, Composites and CCTV Tim Valentine, Josh P Davis John Wiley & Sons, 22 Jun. 2015 - Psychology - 392 pages
Holistic Comparison		Holistic comparison exploits a basic human ability, where all facial features are assessed simultaneously and compared to another face or image of a face. Holistic comparison is common practice in facial review. It may occur that the individual assessing the facial features during review cannot explicitly explain the basis for his or her conclusion, therefore limiting the forensic value of this approach.	FISWG Section 6 0 Guidelines for Facial Comparison Methods https://fiswg.org/FISWG_GuidelinesforFacialComparisonMethods_v1.0_2012_02_02.pdf

FACIAL IDENTIFICATION TERMS	ACRONYM	MEANING	REFERENCE
Interpupillary Distance	IPD	Distance between the pupil centres of human eyes.	Dodgson N.A. 2004, Variation and extrema of human interpupillary distance, SPIE Vol. 5291 Stereoscopic Displays and Virtual Reality Systems XI
Morphological Analysis		Morphological analysis as a comparison method is based on the assessment of correspondence of the shape, appearance, presence and/or location of facial features. These features include global (corresponding to the overall face), local (including anatomical structures such as nose or mouth and their components, e.g., nose bridge, nostrils, ear lobes) and discriminating characteristic facial marks such as scars or moles. Morphological analysis is a systematic method of facial comparison in which the features of the face are described and compared. Conclusions in relation to similarity or difference are based on subjective assessment and interpretation of observations. Morphological analysis is the recommended method by FISWG.	FISWG Section 6 0 Guidelines for Facial Comparison Methods https://fiswg.org/FISWG_GuidelinesforFacialComparisonMethods_v1.0_2012_02_02.pdf
Normalisation		For face - The process to assist the comparison of facial images, where they are manually or automatically processed to be the same size and orientation. Best practice is to increase the small face(s) to the larger.	
Photo-anthropometry		Photo-anthropometry is derived from facial anthropometry, the study of facial measurements of individuals using soft tissue landmarks and bone structure, as used in anthropological and clinical applications. Photo-anthropometry is the measurement of dimensions and angles of anthropologic landmarks and other facial features in order to quantify	FISWG Section 6 0 Guidelines for Facial Comparison Methods https://fiswg.org/FISWG_GuidelinesforFacialComparisonMethods_v1.0_201

FACIAL IDENTIFICATION TERMS	ACRONYM	MEANING	REFERENCE
		characteristics and proportions. The measurements taken from one image are then compared to the measurements taken from a separate facial image. Conclusions are based on subjective thresholds for acceptable differences between measurements.	2_02_02.pdf
Photoboards / Photoarrays		A photoboard or photo array is an identification process that utilises a board or sheet containing a photograph of the suspect and photographs of at least eight other persons resembling the suspect in general appearance, prepared by police and examined by a witness for the purpose of attempting an identification. Photoboard requirements vary between jurisdictions.	Forensic Facial Identification: Theory and Practice of Identification from Eyewitnesses, Composites and CCTV Tim Valentine, Josh P Davis John Wiley & Sons, 22 Jun. 2015 - Psychology - 392 pages
Real Time Facial Recognition	RTFR	See Face In A Crowd.	
Subject Acquisition Profile	SAP	Subject Acquisition Profile - Facial image capture criteria described in NIST Special Publication 500-290, ANSI/NIST-ITL 1-2011 - Data Format for the Interchange of Fingerprint, Facial and Other Biometric Data. Type 10 cover face, and scars, marks and tattoos, and provide different quality levels largely around resolution.	http://ws680.nist.gov/publication/get_pdf.cfm?pub_id=910136
Superimposition		Superimposition is the process of creating an overlay of two aligned images and comparing them visually with the assistance of image transitions. Using video techniques or digital image processing, image transitions can include wipes, fades, and toggles. In a wipe, a	FISWG Section 6 0 Guidelines for Facial Comparison Methods https://fiswg.org/FISWG_Guidelinesfor

FACIAL IDENTIFICATION TERMS	ACRONYM	MEANING	REFERENCE
		straight line passes across the screen gradually revealing the underlying image such that parts of both images at full opacity can be observed simultaneously. A fade one image is progressively replaced by another image by gradually changing the transparency of the image layers such that the entirety of both images is observed at reduced transparency simultaneously. In a toggle each image is displayed for a short time period (fraction of a second) at full opacity. Superimposition is commonly used in conjunction with other methods.	FacialComparison Methods_v1.0_201 2_02_02.pdf

STANDARDS TERMINOLOGY

Standards for facial identification issues, training, capture, system application, and performance and testing, and exchange. The key reference documents for biometric terminology come from ISO/IEC 2382-37:2017 Information Technology – Vocabulary – Part 37: Biometrics https://www.iso.org/standard/66693.html and have been interpreted for face.

STANDARDS TERMINOLOGY	ACRONYM	MEANING	REFERENCE
Algorithm		"A limited sequence of instructions or steps that tells a computer system how to solve a particular problem. A biometric system will have multiple algorithms, for example: image processing, template generation, comparisons, etc."	International Biometrics Identity Association (IBIA) https://www.ibia.org/biometrics/glossary
Australia Quality Framework	AQF	The AQF is the national policy for regulated qualifications in Australian education and training. It incorporates the qualifications from each education and training sector into a single comprehensive national qualifications framework. The AQF was first introduced in 1995 to underpin the national system of qualifications in Australia encompassing higher education, vocational education and training and schools.	https://www.aqf.edu.au/
Bias **(Also referred to as Cognitive Bias)**		"The tendency for a consideration to be influenced by background information." "Many fields of forensic science include subjective assessment and comparison stages that are potentially susceptible to subconscious personal bias (cognitive contamination), which in turn could undermine the objectivity and impartiality of the forensic process." The UK Forensic Science regulator has published a best practice guide that "aims to show readers how to recognise cognitive bias and therefore help to safeguard against biasing effects, through adherence to good practice." Bias is not an intentional act. It is an artefact of cognition which "is the mental process of	Cognitive bias effects relevant to forensic science examinations, UK Forensic Science Regulator https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/510147/217_FSR-G-217_Cognitive_bias_appendix.pdf

STANDARDS TERMINOLOGY	ACRONYM	MEANING	REFERENCE
		knowing, including awareness, perception, reasoning and judgement, and is distinct from emotion and volition. Cognitive processes include mental shortcuts, which speed up decision making. However, cognitive bias occurs when the shortcut causes inferences about other people and/or situations to be drawn in an illogical fashion."	
Biometric Match		A determination that two biometric samples correspond to the same source based on some level of computer-evaluated similarity. Does not inherently imply that the probe and candidate are the same person. See also Biometrics, Probe and Candidate List.	https://www.fiswg.org/FISWG_Glossary_v1.1_2012_02_02.pdf See also ISO/IEC 2382-37:2017 Information Technology – Vocabulary – Part 37: Biometrics
Biometric Probe		The Authors' interpretation of ISO vocabulary for facial identification purposes – Image of persons' face being used to compare to a specific sample(s) or return a candidate list in a biometric system.	ISO/IEC 2382-37:2017 Information Technology – Vocabulary – Part 37: Biometrics
Biometric Sample		The Authors' interpretation of ISO vocabulary for facial identification purposes – Image of persons face prior to biometric templating.	ISO/IEC 2382-37:2017 Information Technology – Vocabulary – Part 37: Biometrics
Biometric Template		The Authors' interpretation of ISO vocabulary for facial identification purposes – Where an image of a person's face is turned into a digital record through a (usually a commercial secret and proprietary) process of biometric feature extraction that will be used for comparison.	ISO/IEC 2382-37:2017 Information Technology – Vocabulary – Part 37: Biometrics
Biometrics		A general term used alternatively to describe a characteristic or a process. (1) As a characteristic: a measureable biological (anatomical and physiological) and behavioural characteristics that can be used for automated recognition. (2) As a process: automated methods of recognizing an individual based on measureable biological (anatomical and physiological) and behavioural characteristics.	https://www.fiswg.org/FISWG_Glossary_v1.1_2012_02_02.pdf See also ISO/IEC 2382-37:2017 Information Technology – Vocabulary – Part 37: Biometrics

STANDARDS TERMINOLOGY	ACRONYM	MEANING	REFERENCE
Candidate List		The Authors' interpretation of ISO vocabulary for facial identification purposes – A list from zero to a length, specified or where a threshold limits responses, of faces typically in order or mostly likely similar to least, that warrant further analysis usually by a trained human facial image reviewer.	ISO/IEC 2382-37:2017 Information Technology – Vocabulary – Part 37: Biometrics
Compression - Lossy and Lossless		**Lossy Compression** File size reduction process in which data is lost and cannot be retrieved in its original form (e.g., high-compression JPEG). **Lossless Compression** File size reduction process in which no data is lost and all data can be retrieved in its original form (e.g., TIF).	https://www.fiswg.org/FISWG_Glossary_v1.1_2012_02_02.pdf
CSI Effect		Colloquial – CSI (Crime Scene Investigator) Effect is any exaggerated and even impossible portrayal of forensic science techniques and technology capability and effectiveness.	
Deduplication		This is a quality assurance and fraud detection process undertaken to identify duplicate information in a biometric system. This is achieved when images are biometrically matched against every other typically in conjunction with biographical and other data, and a matching threshold is used to identify duplicates. Biometric duplicates of the same person will exist where there are data entry and loading errors making the same person appear to be two or more persons. This can also occur where persons have undertaken a lawful change of personal details (e.g. names) and where a system has been deliberately compromised to create fraudulent identities. Deduplication requires a manual review of results to determine what has occurred and is recommended to be undertaken by people familiar with facial recognition performance issues and trained in face comparison as there will be a FMR based upon the threshold of the system.	www.fiswg.org

STANDARDS TERMINOLOGY	ACRONYM	MEANING	REFERENCE
Detection Error Trade-Off	DET Graph/Cure	A plot of FRR to FAR(Y Axis to X Axis) (Miss versus Incorrect Match) usually on a logarithmic scale. Best biometric performance is the curve closest to the bottom of the plot.	ISO/IEC 19795-6:2012 Information technology -- Biometric performance testing and reporting -- Part 6: Testing methodologies for operational evaluation
Doddingtons' Zoo		Not all biometric samples in a system match equally to other images of the same person. This variation has been characterised as: Sheep: A person who is a Sheep produces a biometric that matches well to other biometrics of themselves and poorly to those of other people. Goats: A person who is a Goat produces a biometric that matches poorly to other biometrics of themselves. Lambs: A person who is a Lamb can be easily impersonated. When the biometric of such a person is paired to a biometric from a different person the resulting match score will be higher than average. Wolves: A person who is a Wolf is good at impersonation. When such a person presents a biometric for comparison they have an above average chance of generating a higher than average match score to a stored biometric of a different person.	G. Doddington, W. Liggett, A. Martin, M. Przybocki, and D. Reynolds. Sheep, goats, lambs and wolves: A statistical analysis of speaker performance in the NIST 1998 speaker recognition evaluation. In Proc. ICSLD, 1998.
Eigenface		Used as an early facial recognition technique to compare faces as efficiently as possible using machines, focusing on the variations between faces through mathematical analysis. "In mathematical terms, …to find the principal components of the distribution of faces, or the eigenvectors of the covariance matrix of the set of face images. Each image location contributes more or less to each eigenvector, so that we can display the eigenvector as a sort of ghostly faces which we can an eigenface." It is based upon an earlier "technique developed by Sirovich and Kirby [Low-dimensional procedure for the characterization of human faces," J.Opt. Soc. Am.Vol 4, No 3, March 1987, 519-524] for efficiently representing pictures of faces	Face Recognition Using Eigenfaces, Turk M, Pentland, A, MIT, 1991.

STANDARDS TERMINOLOGY	ACRONYM	MEANING	REFERENCE
		using principal component analysis…[being] a collection of face images collection of weights for each face and a small set of standard pictures."	
Enhance		In the context of facial identification, a tool, technique and/or process of improving the visibility of facial detail to assist searching and comparison of faces. Best practice is to preserve originals and follow a non-destructive process noting all steps. Enhance techniques capabilities are subject to CSI Effect.	
Equal Error Rate	EER	The point on a graph where the FNMR = the FMR.	
Fail To Acquire	FTA	The Authors' interpretation of ISO vocabulary for facial identification purposes – failure of a face detection and capture process to obtain a suitable biometric sample (facial image).	ISO/IEC 19795-6:2012 Information technology -- Biometric performance testing and reporting -- Part 6: Testing methodologies for operational evaluation
Failure to Enrol	FTE	The Authors' interpretation of ISO vocabulary for facial identification purposes – failure to create and store a biometric template that can be used for matching [more accurately this is a biometric enrolment data record and includes non-biometric data – see ISO] for a successfully acquired facial image and associated data. For face usually a quality issue or associated data loss.	ISO/IEC 19795-6:2012 Information technology -- Biometric performance testing and reporting -- Part 6: Testing methodologies for operational evaluation
False Accept Rate	FAR	The proportion of times the biometric system falsely matches as correct a probe to a candidate. An incorrect match. Similar to FPR.	ISO/IEC 19795-6:2012 Information technology -- Biometric performance testing and reporting -- Part 6: Testing methodologies for operational evaluation

STANDARDS TERMINOLOGY	ACRONYM	MEANING	REFERENCE
False Non-Match Rate	FNMR	Proportion of biometric searches that are falsely said to not have a mate in the system where there is one. Effectively a miss. Roughly the same as FRR.	ISO/IEC 19795-6:2012 Information technology -- Biometric performance testing and reporting -- Part 6: Testing methodologies for operational evaluation
False Positive Rate	FPR	The proportion of times the biometric system falsely matches a probe as correct to a candidate.	ISO/IEC 19795-6:2012 Information technology -- Biometric performance testing and reporting -- Part 6: Testing methodologies for operational evaluation
False Reject Rate	FRR	Proportion of biometric searches that are falsely said to not have a mate in the system where there is one. Effectively a miss. Roughly the same as FNMR.	ISO/IEC 19795-6:2012 Information technology -- Biometric performance testing and reporting -- Part 6: Testing methodologies for operational evaluation
Histogram		A graphical representation of the distribution of numerical data. For images, the frequency distribution is typically 0-255 where for images the x-axis represents the range from darkest (0) to lightest (255) parts of an image, and the y-axis represents the intensity at each of those values for either colour (Red, Green, Blue (RGB)) or luminosity. Histograms of faces should not include the subjects clothes or the background of the image.	Cambridge in Colour http://www.cambridgeincolour.com/tutorials/histograms1.htm
International Civil Aviation Organization - Machine Readable Travel Documents	ICAO 9303	The Seventh Edition of Doc 9303 represents a restructuring of the ICAO specifications for Machine Readable Travel Documents. Covers the standards for photographing people for passport images.	https://www.icao.int/publications/Documents/9303_p3_cons_en.pdf
International Organization for Standardization /International Electro technical	ISO 19794-5:2011	The ISO/IEC 19794-5:2011 standard is the fifth part of a multipart biometric data interchange format standard. The standard is organised by modality, and other parts cover fingerprint images, irises, and hand geometry among many others. The Part 5 standard is the most widely	ISO/IEC 19794-5:2011, Information technology – Biometric data interchange formats – Part 5: Face image data https://www.iso.org/standard/50867.html

STANDARDS TERMINOLOGY	ACRONYM	MEANING	REFERENCE
Commission		implemented, most actively developed, and most modern face standard. Its content drove the revision of the Type 10 record of the ANSI/NIST ITL 1-2007 described in section.	
		At the time of preparing this Glossary the standard was under review. It is intended that identity management applications will be incorporated in the revised standard. The foremost of these is the e-Passport, which the International Civil Aviation Organization formalised in its ICAO 9303 standard. This is based on the ISO/IEC 19794-5 standard as the mandatory globally interoperable data element for ISO/IEC 14443 contactless chip passports.	
Interpolation		In the context of facial identification, this is a process for resizing or scaling an image (usually larger) to assist biometric enrolment and facial image comparison. There are many methods of image interpolation. The advantages and disadvantages of these methods are not in scope of this glossary.	
Match Score		The authors' interpretation of ISO vocabulary for facial identification – The numerical value (may appear as a percentage but is usually a logarithmic value) of the similarity between two faces (biometric samples) - usually shown as the probes similarity to the most likely candidates returned when a search result is displayed.	ISO/IEC 19795-6:2012 Information technology -- Biometric performance testing and reporting -- Part 6: Testing methodologies for operational evaluation
National Information Exchange Model	NIEM	The National Information Exchange Model (NIEM) is a common vocabulary that enables efficient information exchange across diverse public and private organizations. NIEM connects communities of people who share a common need to exchange information in order to advance their mission. NIEM is being adopted for Australian inter-agency transfers.	https://www.niem.gov/about-niem

STANDARDS TERMINOLOGY	ACRONYM	MEANING	REFERENCE
Receiver Operating Characteristic	ROC Graph/ Curve	A ROC curve plots on the x-axis the false positive rate [FAR] comparisons that exceed the match) versus the true positive rate [1-FRR] (i.e. the percentage of genuine (or same subject) comparisons that exceed the match threshold) on the y-axis. Any particular point on the ROC plot corresponds to the measured true positive and false positive rate at a particular match score threshold. The value of visualizing FR algorithm accuracy in the form of an ROC plot is that an organization (with the help of its integrator) can better determine which match threshold it should use as a function of how many false positive identifications it has the human effort to process, or the minimum true positive rate acceptable by its mission. Best performance is towards the top of the graph/curve.	https://fiswg.org/DRAFT_FISWG_FRS_Testing_Operation_Assurance20140509.pdf
Thick Client		Also known as Fat Client. Typically has a local software application that requires more local storage and processing, and usually does not always require constant connectivity to servers. Usually more robust and provides more features and capabilities to users.	
Thin Client		A browser or software interface in a network environment to a system where most or all storage and processing etc. is done on remote servers. Requires constant connectivity to server to function. Requires less local processing power.	
Threshold (Match)		The Authors' interpretation of ISO vocabulary for facial identification purposes – a match score where a decision boundary exists, typically being a specific known value in a biometric system that is expected or known to be a reliable indicator of a correct match.	ISO/IEC 19795-6:2012 Information technology -- Biometric performance testing and reporting -- Part 6: Testing methodologies for operational evaluation

STANDARDS TERMINOLOGY	ACRONYM	MEANING	REFERENCE
Watchlist		In the context of facial identification, this is: A selection of persons enrolled in a facial recognition system that allows a probe to be matched against only a selection of the overall system face holdings; and/or a list of people that a Face in the Crowd live facial recognition system is searching against.	

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