

Date: March 2022

Location

@qualcomm



Biometric Performance

Speaker name : Reza Barazideh

FIDO Requirements for Biometric Performance

According to FIDO, the minimum number of required subjects for different value of FAR are listed in this table

In general, if a subject enrolls multiple template (e.g. for fingerprint index and thumb) and uses them interchangeably (i.e. one OR another), the FAR increases where the FAR for two templates enrolled is approximately twice the FAR for one template enrolled. Then, we have

$$FAR_{MT} = 1 - (1 - FAR_{SA})^B$$

Where B is the number different input template (e.g., different fingers).

Consider that in the laboratory test, it is possible to have fewer comparisons, as some transactions may result in an FTA (Failure-to-Acquire Rate).

Table: Rule of 3 for FAR

Rule of 3 ([ISO/IEC-19795-1])	FAR	Fingerprint			
			2D Facial		3D Facial
	0.0100%	0.0040%	0.0020%	0.0013%	0.0010%
	1:10,000	1:25,000	1:50,000	1:75,000	1:100,000
One unique sample per person (e.g., one finger or one eye)					
# of people needed (n)	245	390	550	675	775
# Combinations-C = n(n-1)/2	29890	75855	150975	227475	299925
Claimed error = 3/C (when zero errors in C combinations)	0.0100%	0.0040%	0.0020%	0.0013%	0.0010%
Two unique sample per person (e.g., two fingers or two eyes)					
# people needed (n)	123	195	275	335	388
# unique samples (a)	2	2	2	2	2
# Combinations-C = (a ²)*n*(n-1)/2	30012	75660	150700	223780	300312
Claimed error = 3/C (when zero errors in C combinations)	0.0100%	0.0040%	0.0020%	0.0013%	0.0010%

Difficulty of fulfilling the Biometric Performance requirements

- According to the requirements in the current draft of TS.53 and the requirements in FIDO, performing the test by real person has some difficulties such as:
 - 1- FIDO is the only organization that can do the test right now
 - 2- There are many barriers for vendor to do the test by itself such as:
 - The population is not representative of the target market in relationship to age, gender, and race
 - Ignoring the population problem, it takes a lot of time and resources to perform the test as required by FIDO
- For example, if we want to test 3D facial performance, for testing each device we need:
 - Number of required subject: 775
 - Time for each 3D scanning : 60s
 - Total time = $775 \times 60s$ (13 Hours)