

ENVIRON PROVIDES GOVERNMENT & CORPORATIONS WITH FINGER VEIN TECHNOLOGY FOR SOCIAL INCLUSION IN BLACK POPULATIONS

DATASHEET

The universal acceptance exception-handling biometric system for Africa

Leverage Japanese Technology proven and tested in Nigeria

Several countries around the world have deployed Vein biometrics and there are likely to be new markets and application areas where Vein biometrics can make a big impact to the existing status quo. This impact can range from a simplistic desire to increase security for Savings account holders, right through to complex government social inclusion policies that look to bring some form of higher user acceptance, security and a social inclusive non-discriminative system. Fingerprint, facial and Iris systems both have the credibility of long-time use by national and governmental organisations in many countries.

However, these modalities have been proven to be far more disproportionate in application performance failure for black population citizens.

Biometric considerations for African users and countries with black populations

In 2005 the UK government scrapped the use of Iris recognition for the UK immigration services as the False Rejection rate (FRR) was too high within identifying black and ethnic citizens representing 13% of the UK population. The official FRR of Iris recognition is at 10%, although this number is considered to be significantly

higher amongst black and ethnic individuals hence the decision taken by the UK Home Office to remove the use of Iris recognition. In 2018, MIT computer scientist, Joy Buolamwini, conducted an exercise to test the application of Facial Recognition biometrics for black female individuals. Her results concluded figures as high as 35% FRR amongst this segment of individuals.

This is a worrying development given this form of biometric facial recognition system is used in the United States (US) by the FBI. The US Government Accountability Office (GAO) analysed the FBI biometric results recording an FRR of 15% for overall results.

However, this number is considered to be significantly higher and possibly closer to an FRR of 50% amongst US black population citizens. Elijah Cummings, a US congressman for Maryland, called for the FBI to test its technology for racial bias given this category of individuals are subjected to this type of technology more than any other group of US citizen.



Fingerprint and Finger Vein application use

The use of both Fingerprint and Finger Vein can be allied to work side-by-side,

at the point where Fingerprint error occurs, a switch to the higher accuracy, more secure and faster recognition speed can take place with Finger Vein. In terms of biometric application in Africa, additional metrics are to be considered such as weather conditions, evasive-security, connectivity, and in the case of Fingerprint - damaged prints. The official rejection rate of Fingerprint is 10%, but this official result has not taken into consideration global populations that contain higher numbers of artisans and tradesmen, hence the FRR will be significantly higher in Africa. The fingerprint FAR sits around the 1% mark, this is 10 times less accurate than Finger Vein Technology. In addition, Finger Vein patterns inside the finger cannot be acquired unless the person chooses to have their biometric feature scanned. Fingerprints are often seen as an invasion of privacy as prints leave a trace and can be easily forged. There are many well documented cases globally of Fingerprint lifting - forgery, thus potentially exposing many African countries to fraudulent and criminal activities to compromise the system.

The history of Finger Vein biometric Technology

The system works by the transmission of near infra-red light into the finger from LEDs positioned inside the scanner. The small but detailed image that is captured allows for the creation of a compact template. The image is run through a special image processing algorithm to create a finger vein pattern that is digitized, compressed, encrypted and stored as template data. In 1997,

Hitachi decided to investigate and develop new biometric technology for "societal use" including: banking, local/central government, security and access control. More than 200 researchers from various Hitachi Laboratories joined to this project. Finger vein patterns are different in each finger of each person and, since they are hidden beneath the surface layer of the skin, forgery is eradicated. The Hitachi Group worked with the medical departments of several leading universities in Japan to provide further scientific evidence. The statistical approach samples were from a representative sample size, which in biometrics terms is recognised to be representative if yielding a false accuracy rate (FAR) of within 1 in 1 million, or 1/1,000,000 and reported by various global independent comparative biometrics studies.

Japan Post (Post Office) selected the deployment of Finger Vein and is currently used in over 20,000 branches. In the Japanese banking sector, the only biometric widely adopted is Vein biometrics. Finger Vein biometrics is the 80% market share leader deployed in over 30,000 branches and 75,000 ATM's. In terms of the global banking industry, Finger Vein speed of transaction 0.5 to 1 Second (Finger Print can take multiple attempts before recognised and can be too slow for optimum bank transactional speeds). Following major banking roll-outs in Turkey and Poland, Barclays bank in the UK is the latest European bank to adopt Finger Vein Technology for use of its corporate account holders. Various other global government agencies have adopted Finger Vein biometric systems.

Biometric Exception handling figures for Nigeria

In the 2016 Annual General Meeting of The Nigerian Institute of Building (NIOB) a forecast requirement was made for an additional 10 million artisans and tradesmen over the next 20 years. Other categories of fitters and machinists, carpenters, motor mechanics, plumbers and others – are in high demand. They are a vital arm of the Nigerian economy, especially the construction industry. Based on a working assumption of 200 million Nigerian citizens and the earlier identified shortcomings of Fingerprint in FTE, FRR and FAR, 10 million such workers across the country with damaged Fingerprints could potentially be prone to a 100% FTE and FRR. In addition, the total population of 200 million citizens at the official Fingerprint 1% FAR and 10% FRR, respectively renders 2 million and 20 million potential unidentified. The Finger Vein biometric system in this category could potentially exception handle, in total 32 million citizens otherwise potentially socially excluded. On a working assumption of both facial and iris recognition performance shortcomings, highlighted in black population results applying the potential average of a 40% FRR, this renders a requirement to exception handle 80 million citizens. Thus, a potential combined total of 122 million citizens to be exception-handled by the deployment of the Finger Vein biometric system. This figure forecast does not include accommodated projections for compromised Fingerprint forgery or other biometric FTE rates.



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