

The FVC2002 Fingerprint Verification Competition

The FVC is the largest independent fingerprint competition ever hosted representing many of the worlds leading fingerprint algorithm suppliers. The competition is organized by the Biometric System Lab at the University of Bologna, the Pattern Recognition and Image Processing Laboratory of Michigan State University and the U.S. National Biometric Test Center at San Jose State University, and is considered by many in the industry to be the pre-eminent, independent test of fingerprint technology.

The goals of the FVC competition are to establish a common benchmark allowing developers to unambiguously compare their algorithms and to provide a showcase for state-of-the-art fingerprint recognition technology. The competition "levels the playing field" by using multiple sensors to generate large fingerprint databases that are not optimized for any particular algorithm, using fingerprint acquisition methods that simulate "real-world", rather than laboratory conditions.

The History of the FVC

The first international competition on fingerprint verification, FVC2000, was organized in 2000. This event received a great attention both from academic and industrial biometric communities. While on the one hand, it established a common benchmark allowing developers to unambiguously compare their algorithms, on the other hand it provided an overview of the state-of-the-art in fingerprint recognition. FVC2000 was undoubtedly a successful initiative as evident by the following:

- 11 organizations participated in the contest
- 4 different fingerprint databases were collected

FVC 2002

The aim of this competition is to track recent advances in fingerprint verification, for both academia and industry, and to provide up to date state-of-the-art in fingerprint technology.

While 31 algorithms were tested, not all competitors chose to identify their submissions, and thereby remained anonymous in terms of the publication of the full set of results. In any event, the results obtained gave a useful overview of the state-of-the-art in this field and will provide guidance to the participants for improving their algorithms.

Results

The accuracy of Bioscrypt Core™ has been evaluated by a variety of sensor manufacturers and other organizations. The results of these evaluations consistently show that Bioscrypt is the industry leader in algorithm accuracy.

To demonstrate our versatility, Bioscrypt chose to submit two versions of Core to the competition – one focused on accuracy and the other on speed. Combined, Bioscrypt's two submissions won 19 of the 24 Gold Medals awarded and placed first and second in the official ranking.

The results for the industry entrants can be found below. The table shows Equal Error Rate (EER), one measure of the accuracy of an algorithm, as well as the processing time. As can be seen in the table, Bioscrypt Core is substantially more accurate than the competition.

For this competition, no user feedback was provided as part of the fingerprint collection process and no screening of the data was performed. Bioscrypt Core uses feedback to improve enrollment, and the lack of this feedback is believed to be the primary reason for equal error rates that are elevated relative to most Bioscrypt systems. Additionally, the "ridge-lock" finger positioning system provides additional reliability enhancement that allows Bioscrypt systems to operate at an equal error rate much less than 0.1%.

More details can be found on the FVC2002 web site at: <http://bias.csr.unibo.it/fvc2002>

Results Table

Algorithm	EER	ZeroFMR	Verification Time
Bioscrypt 1	0.19%	0.38%	1.97
Bioscrypt 2	0.77%	1.29%	0.22
Siemens	0.92%	2.29%	0.52
Neurotechnologija	0.99%	3.11%	0.56
Sagem 1	1.18%	4.21%	1.65
Sagem 2	1.42%	4.60%	0.66
Idencom	2.22%	6.27%	0.62
Suprema	2.50%	6.14%	0.63
Activcard Canada	5.21%	11.69%	1.76
Antheus Technologia	5.46%	25.47%	0.54
TeKey	5.72%	79.97%	3.15
FingerPin	6.05%	48.50%	0.77
Aldebaran Systems	6.16%	9.74%	1.81
Digital Fingerpass	6.40%	19.87%	0.50
DataMicro	6.72%	18.26%	0.56