

INNOVATRICS Achieves Excellent Results in NIST FpVTE Benchmark

INNOVATRICS is proud to announce an exceptional level of performance and generally excellent results of its AFIS algorithm in the Fingerprint Vendor Technology Evaluation (FpVTE 2012).

FpVTE, organized by the National Institute of Standards and Technologies (NIST), is the most important evaluation of large 1-to-many fingerprint identification algorithms using enrollment sample sizes in the multi-millions.

It is the first independent evaluation focused on large scale fingerprint identification since FpVTE 2003.

"System integrators and government representatives rely on NIST FpVTE benchmarks to determine how well AFIS products will perform in real-life implementations. The independent test ignores the brands and allows the technology to speak for itself," said Jan Lunter, Chief Technology Officer at INNOVATRICS.

INNOVATRICS Top-Ranks in Overall Performance

The FpVTE 2012 report classifies INNOVATRICS' submission among the **best in every evaluation scenario** when ranking overall performance.

The overall performance of submissions is expressed as an operational score combining the most relevant identification statistics. Factors incorporated into operational ranking were: Identification Time, Accuracy, Enrollment Time and RAM Consumption.

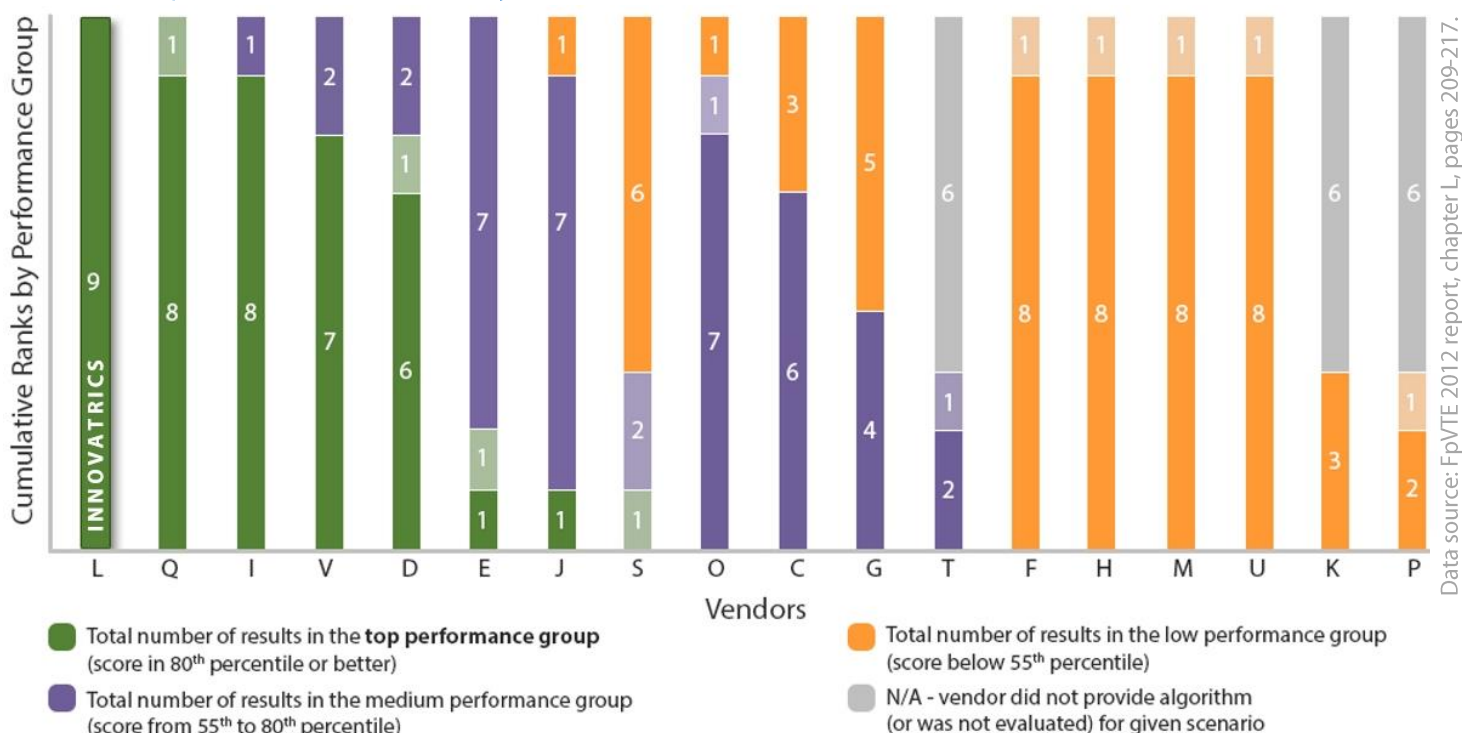
These criteria depict **the most relevant AFIS (Automated Fingerprint Identification System) requirements**.

The **INNOVATRICS algorithm is ranked in the top performance group** (result in 80th percentile or better) in each of the nine tested scenarios¹ (one-to-many identification using various finger combinations from single finger up to ten fingers).

Besides INNOVATRICS, only one other vendor consistently scored in the top performance group (see chart "Operational Rank Summary" below).

¹ Evaluated scenarios within FpVTE 2012: Left Index Finger Search, Right Index Finger Search, Left and Right Index Finger Search, Left Slap (4-finger) Search, Right Slap (4-finger) Search, Left and Right Slap (8-finger) Search, Ten-finger Identification Flats Search, Ten-finger Rolled Impressions Search, Ten-finger Plain Impressions Search.

Chart: *Operational Rank Summary*



Data source: FpVTE 2012 report, chapter L, pages 209-217.

Only higher ranked submissions from each vendor are reported. **Light color** means the result was achieved in the slow group (Submissions in Left index, Right index, Left and Right index finger search were split by NIST into fast group and slow group depending on whether the average search time was less than 20 s or more than 20 s).

The balanced overall performance of INNOVATRICS algorithms in all categories and across all scenarios predetermines **INNOVATRICS as a universal provider of complete solutions for fingerprint identification.**

This proves that our product portfolio integrating benchmarked algorithms is suitable for a wide range of applications: real-time applications with one and two fingerprints, civil AFIS solutions for large scale deployment, as well as law enforcement AFIS applications.

INNOVATRICS Achieves First Class Results in Speed and Accuracy

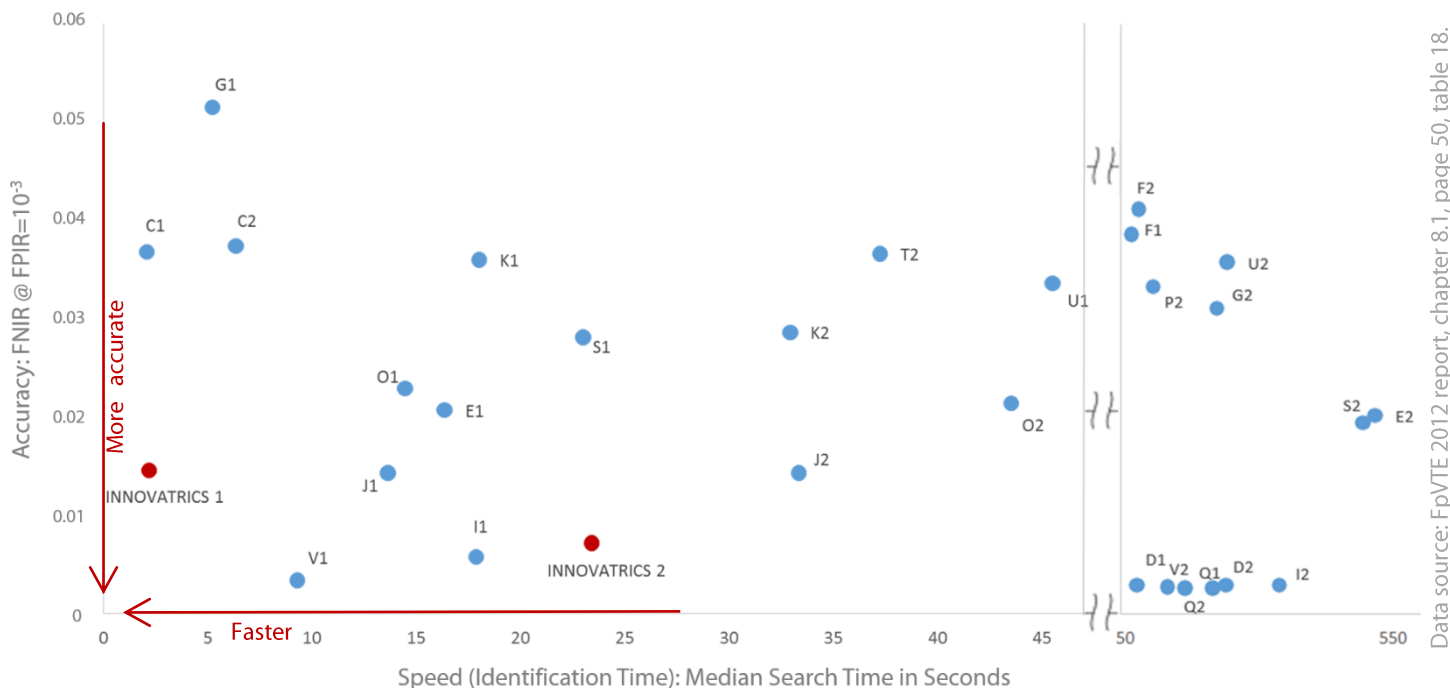
The FpVTE 2012 evaluation demonstrates that the **INNOVATRICS algorithm achieved high levels of accuracy** while processing fingerprints faster than other vendors.

Being fast and accurate are very important factors for large scale AFIS systems as well as for real-time identification solutions. **INNOVATRICS' ability to be one of the fastest among the most accurate vendors on the market** makes its technology suitable for nation-wide projects with large quantities of records (AFISes for ID cards, passports, etc.), for systems with very high throughput (border control solutions), and real-time identification systems (banking CRM, watch list check, etc.).

The high speed of INNOVATRICS technology saves hardware resources, reduces maintenance, and makes our product more energy efficient and thus environmentally-friendly.

The charts below summarize INNOVATRICS' performance in the most common scenarios related to civil AFIS: Left and Right Index Search and Ten-finger Identification Flats Search.

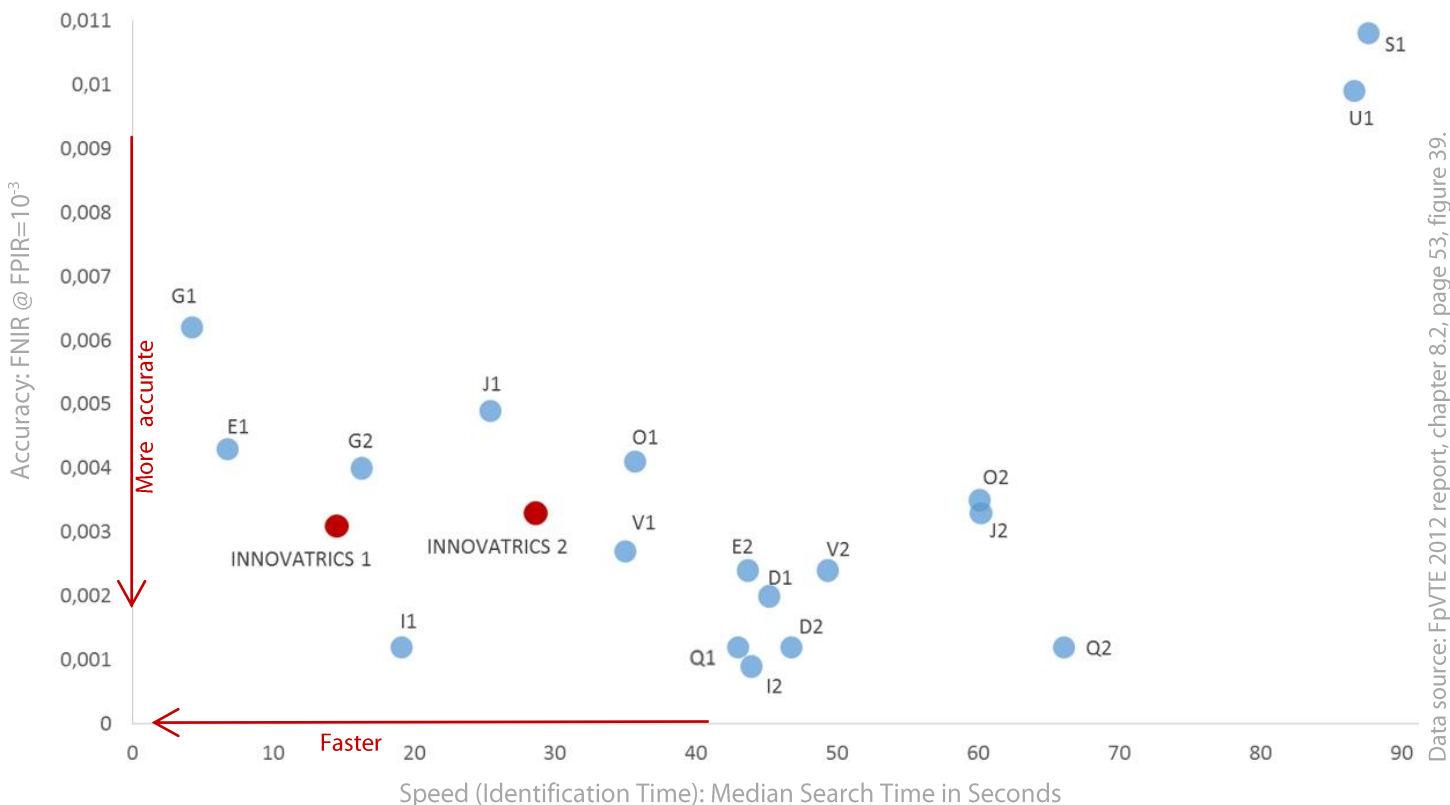
Chart: *Speed-to-Accuracy Ratio for Left and Right Index Finger Search*



Data source: FpVTE 2012 report, chapter 8.1, page 50, table 18.

The INNOVATRICS 1 algorithm is 2.5 times more accurate than submissions from other vendors operating at comparable speed levels. In case of two-finger search scenario, the **INNOVATRICS algorithm is clearly the most accurate among the fastest** submissions.

Chart: *Speed-to-Accuracy Ratio for Ten-Finger Identification Flats Search*



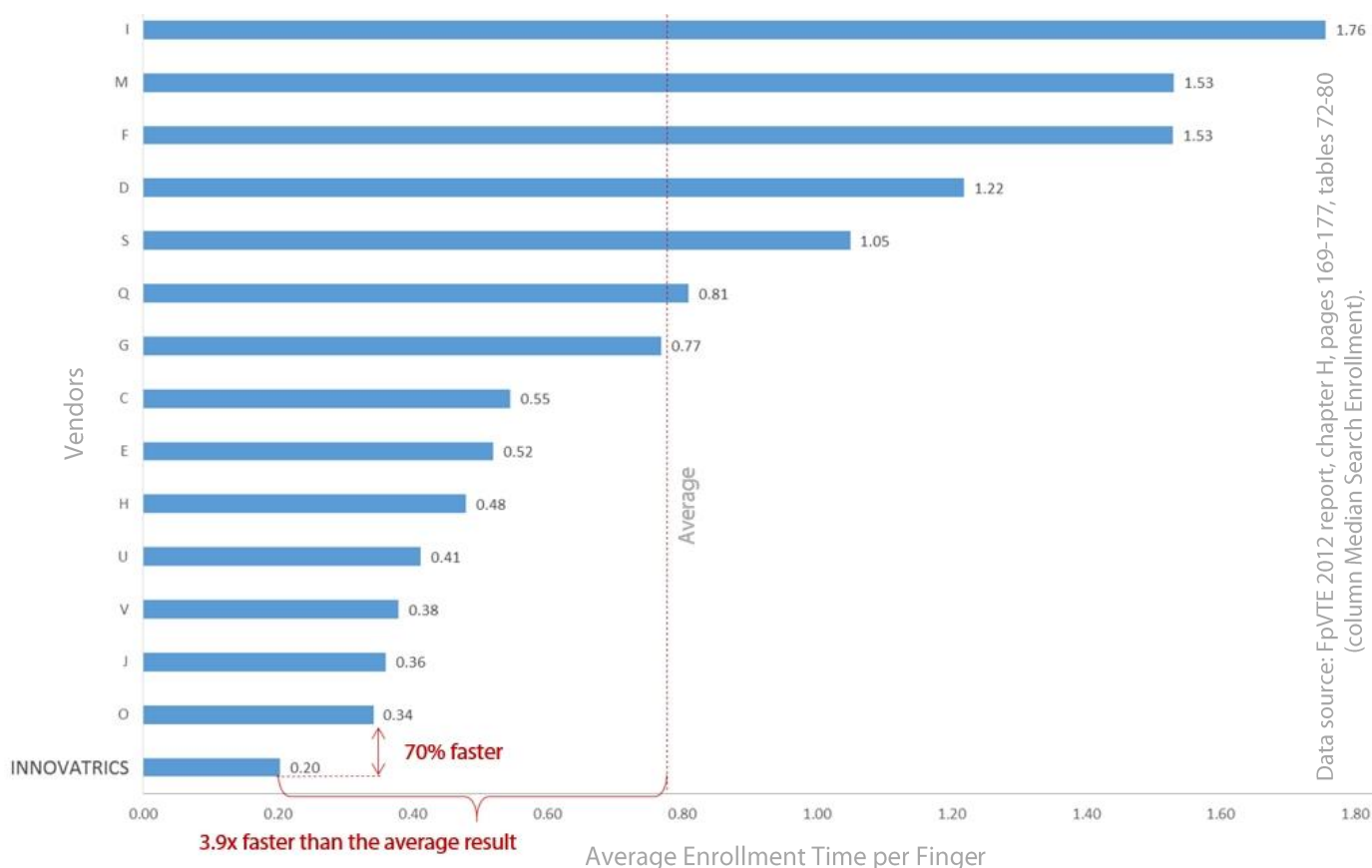
Data source: FpVTE 2012 report, chapter 8.2, page 53, figure 39.

The INNOVATRICS algorithm exhibits one of the **most balanced speed-to-accuracy ratio**.

INNOVATRICS Ranks #1 in Enrollment Time

According to the FpVTE report, INNOVATRICS has the **shortest average enrollment time** among all vendors. INNOVATRICS enrollment is 70% faster than the second fastest vendor. Enrollment time comprises fingerprint template **extraction** time from raw image **and** image **segmentation** time in the case of multi-finger images. As enrollment is a mandatory step in every AFIS transaction (registration, verification, and identification), **fast enrollment is one of the key factors in achieving low latency and high throughput of AFIS operations.**

Chart: *Average Enrollment Time per Finger*



Reported time is the average calculated from all the submissions of a given vendor for classes A, B and C. In the case of multi-finger enrollments, enrollment time is divided by the total fingerprint count.

Average enrollment time per finger for the INNOVATRICS algorithm was 0.2 s, which is 3.9 times faster than the average result.

INNOVATRICS leading position in enrollment time is a result of our long-term experience as a provider of SDK modules for fingerprint scanner manufacturers. SDK modules are often used on a wide range of platforms (embedded modules, mobile solutions, smartphones, etc.) **where extraction speed is crucial.**

"Our efficient extraction and segmentation algorithms allow real-time enrollment and quality control without any accuracy degradation, even with very limited hardware resources," observed Matus Kapusta, Chief Product Officer at INNOVATRICS. *"In the world of large-scale AFIS solutions, short enrollment times are making migration from legacy systems to modern AFIS solutions fast and easy,"* he adds.

The fingerprint algorithms (extraction, matching, segmentation) evaluated in the FpVTE benchmark are included in several INNOVATRICS products:

SDKs: [IDKit Fingerprint SDK](#), [Fingerprint Segmentation SDK](#)

Enrollment Solutions: [BioScriber](#)

AFIS: [WebAFIS](#), [ExpressID AFIS](#).

You can find out more about these products and the INNOVATRICS portfolio at:

www.innovatrics.com

For inquiries about licensing INNOVATRICS algorithms, please contact us at sales@innovatrics.com.

About FpVTE

The Fingerprint Vendor Technology Evaluation (FpVTE 2012) - a worldwide comprehensive range of tests that is open to everyone in the industry - was conducted at the National Institute of Standards and Technology (NIST). These tests were primarily performed to assess the current capabilities of fingerprint matching algorithms using operational data-sets containing several million subjects.

The tests included three classes of participation that examined one-to-many identification using various finger combinations from single finger up to ten fingers.

- Class A used single-index finger capture data and evaluated single index finger (right or left) and two index finger (right and left) identification.
- Class B used identification flat (ID Flat) captures (4-4-2; left slap, right slap, and two thumbs simultaneously) and evaluated ten-finger, eight-finger (right and left slap), and four-finger (right or left slap) identification.
- Class C used rolled and plain impression (4-4-1-1; left slap, right slap, left thumb, and right thumb) captures and evaluated ten-finger rolled-to-rolled, ten-finger plain-to-plain, and ten-finger plain-to-rolled identification.

Enrollment sets used for one-to-many identification varied in size from 5,000 up to 5,000,000 enrolled subjects. Any segmentation of four-finger slap images or two-thumb captures was performed by the submitted software. All data used was sequestered operational data that was not shared with any of the participants.

The NIST FpVTE 2012 full report is available at:

<http://nvlpubs.nist.gov/nistpubs/ir/2014/NIST.IR.8034.pdf>

About INNOVATRICS

INNOVATRICS is an independent, trusted partner for biometric technologies for identity management. With our innovative and award-winning algorithm used in Automated Fingerprint Identification Systems (AFIS), we empower all types of organizations around the world to integrate or build powerful and flexible biometric large-scale identification solutions quickly and easily.

With over 10 years in the business and a deeply-experienced, agile team of biometric and software professionals, we focus on our customers first, ensuring the highest level of performance, reliability, and quality of every solution that incorporates INNOVATRICS biometric software.

Find out more about INNOVATRICS at: www.innovatrics.com,

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