CyberExtruder Technical Brief

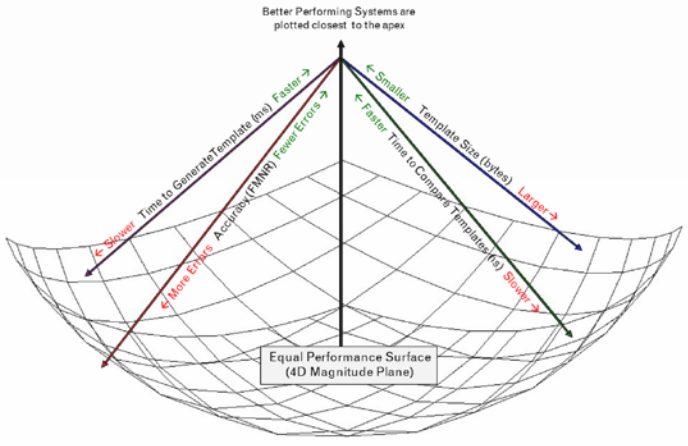
Aureus Insight Version 6.0 outperforms all other NIST tested algorithms

Accuracy is not Enough

To fully understand NIST's Face Recognition Vendor's Test (FRVT) Ongoing Report the reader must look past singular statistics for individual evaluations of accuracy. Attaining high marks for matching accuracy on discrete tests is an impressive achievement, but its only part of the story because accuracy among recent submissions has increased to the point where one is practically indistinguishable from the next. Looking at these results, it's easy to see why the focus must shift from an accuracy only leader board to overall system performance.

Evaluating Overall System Performance

To obtain an equivalent assessment of face recognition systems you must find a 'common language' because each variable has different units of measure e.g., accuracy in percentage or proportion, template size in bytes, template generation time in milliseconds, and match time in nanoseconds. Arriving at this common language is called dimension scaling and it is the standard method of comparing data with variables which have different units of measure. Then, scaling by the average of each variable, we produce a 4D vector which provides a fair comparison of each submission. The magnitude (length) of this 4D vector represents system performance. When plotted, smaller magnitudes are closer to the origin (pyramid apex) and represent better system performance.



A 4-dimensional plot is used to visualize multiple values (dimensions) relative to one another simultaneously. Each dimension is plotted along its corresponding axis. The magnitude of the system performance is then projected from the apex (origin). Systems that are closer to the apex perform better than those further away.

Please go here to try the 4D plotting tool for yourself.
The full White Paper on Accuracy vs System Performance is available here.

Ranking FRVT Results

No single variable – especially accuracy – should be looked at by itself when evaluating a system's operational suitability. For example, if an algorithm gets very high accuracy rates but takes 3 seconds to create a template or the template size is 4kb or it takes 0.5 seconds to compare templates, it would not be an operationally deployable solution for surveillance usage.

CyberExtruder's Aureus Insight (AI) Version 6.0 Outperforms All Others

When plotting the performance vectors as described in this white paper, we can demonstrate the commercially available Aureus Insight v6.0 algorithm significantly outperforms all other NIST tested algorithms in the Visa, Mugshot and Wild image datasets.

"The safe city program in Nuevo Leon needed a face recognition partner capable of integrating into the city's existing camera systems. CyberExtruder was able to provide a centralized system of facial recognition, with localized control and operation, which was flexible enough to work with existing cameras that were already in place in the city. All the features that the state required were included, providing accurate detection, speed, and an identification of people without equal, with the highest standards worldwide. CyberExtruder has given the state an important tool to help lower the crime rate and protect the citizens of Monterrey, with the flexibility of unlimited future system expansion, and accomplished all of this while staying within the state's budget."

-Ing. Javier Broker
Director of Security and Technology
C5 Command and Control, Nuevo Leon

Aureus Insight v6.0 Compared to NIST FRVT Mugshot Image Results		
Rank	Algorithm	System Performance (4D Magnitude)
1	CyberExtruder-AI 6.0	0.16192
2	dermalog-009	0.31875
3	cyberextruder-003	0.34340
4	hertasecurity-001	0.34511
5	maxvision-000	0.35021
Aureus Insight v6.0 Compared to NIST FRVT Wild Image Results		
Rank	Algorithm	System Performance (4D Magnitude)
1	CyberExtruder-AI 6.0	0.26567
2	dermalog-009	0.37385
3	acer-001	0.39032
4	cyberextruder-003	0.40285
5	dermalog-008	0.41272
Aureus Insight v6.0 Compared to NIST FRVT Visa Image Results		
Rank	Algorithm	System Performance (4D Magnitude)
1	CyberExtruder-AI 6.0	0.23396
2	dermalog-009	0.33030
3	maxvision-000	0.34778
4	idemia-007	0.36552
5	idemia-008	0.37312
6	cyberextruder-003	

The complete NIST publication containing the data which forms the basis for this white paper is available free of charge from:
https://www.nist.gov/programs-projects/face-recognition-vendor-test-frvt-ongoing