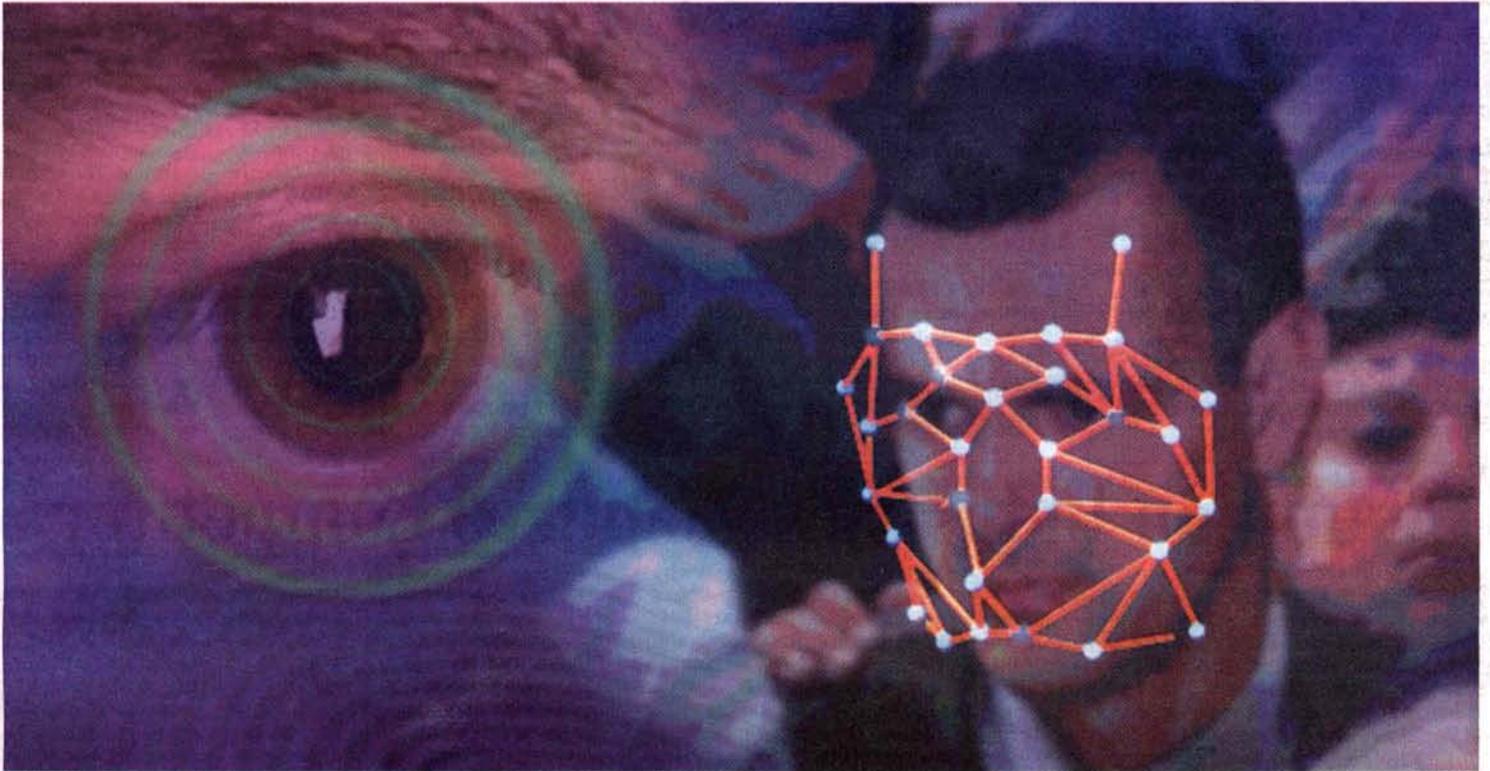


# BIOMETRICS BREAKTHROUGHS



By PAM KASEY

pkasey@statejournal.com

In the three years since Sept. 11, 2001, biometrics has emerged from science fiction to everyday fact. The digital fingerprinting now taking place at our nation's borders is an example of the identification technologies we will one day encounter routinely.

West Virginia will play a dominant role in the industry's continuing emergence — if it offers favorable business conditions, said **Jim Estep**, president and CEO of the **West Virginia High Technology Consortium Foundation**.

Biometrics in West Virginia has achieved its first phases of development, he said.

"The earliest phase was to establish at least one anchor. That was accomplished by Sen. (**Robert C.**) **Byrd** bringing in the FBI and later the **Bio-metrics Fusion Center**," Estep said.

By locating the world's largest fingerprint repository in Clarksburg in

## Technology Emerges to Support Security While Boosting West Virginia Economy

1995, the FBI made north-central West Virginia the hub of biometrics expertise. The BFC, the biometrics testing and evaluation unit of the **Department of Defense**, followed in 2000.

"The secondary phase is growth of our research universities in terms of expanding their programs to provide research and development," Estep said.

**West Virginia University** created the first forensic identification degree program in 1997. About 75 undergraduate and graduate students now pursue courses of study in biometrics, and forensic investigative science — which includes the study of fingerprints — is the largest single major on campus.

Students feed research. The **Biometric Knowledge Center** and the **Center for Identification Technol-**

**ogy Research** based at WVU, both of which conduct biometrics research, steadily are expanding their roles in the national dialog on implementation of biometric technologies.

As Estep sees it, West Virginia is now in a third phase — the influx of biometrics solution providers. That is connected with a fourth — national and international recognition of West Virginia as the center of the biometrics marketplace.

"What can we do as a state to make this a lucrative clearinghouse of biometric products? We have to make this a place that biometrics companies want to be located because there are tax benefits, access to R&D, access to the biggest buyers," he said, citing in particular the need for an overhaul of the tax system for technology companies.

### INSIDE

For additional coverage on biometrics in West Virginia:

- **History** — The acceptance of biometrics as an industry in West Virginia is a process spanning more than a century. **Page 4**
- **Promotion** — People with a stake in biometrics are determined to see it become successful. **Page 4**
- **Conference** — An annual conference is expected to showcase advancements in the Mountain State. **Page 4**
- **Projects** — Biometrics groups are establishing operations in West Virginia. **Page 5**

If West Virginia can improve its business climate, he said, and R&D resources continue to develop, phases III and IV will happen naturally. The industry and the market here will grow and feed on each other, fulfilling the state's potential as the leader in the biometrics marketplace.

## Acceptance of Biometrics Expected to Take Time

By PAM KASEY

pkasey@statejournal.com

"Biometrics" has only been a West Virginia buzzword for a few years, but the idea of identifying people by their physical characteristics has been around for a long time.

In fact, the need for a robust means of identification can be dated to 1869, according to **John Woodward**, director of the **Department of Defense Biometrics Management Office**. Woodward spoke on the topic earlier this year.

Before 1869, Woodward said, the penalty for a felony such as theft or murder was death. Potential for tragic miscarriages of justice aside, the punishment absolutely prevented repeat offenses.

But around 1869 in England and a little later in the U.S., according to Woodward, criminal justice moved toward tailoring the punishment to the individual: lighter for first-time offenders, heavier for recidivists.

This created a problem, he explained. Felons who were punished, released and struck again were motivated to hide past offenses, leading them to adopt alias names, disguise their appearance or move to new locations.

"We have this present person before us; how do we make the link to that person's past acts?" he asked.

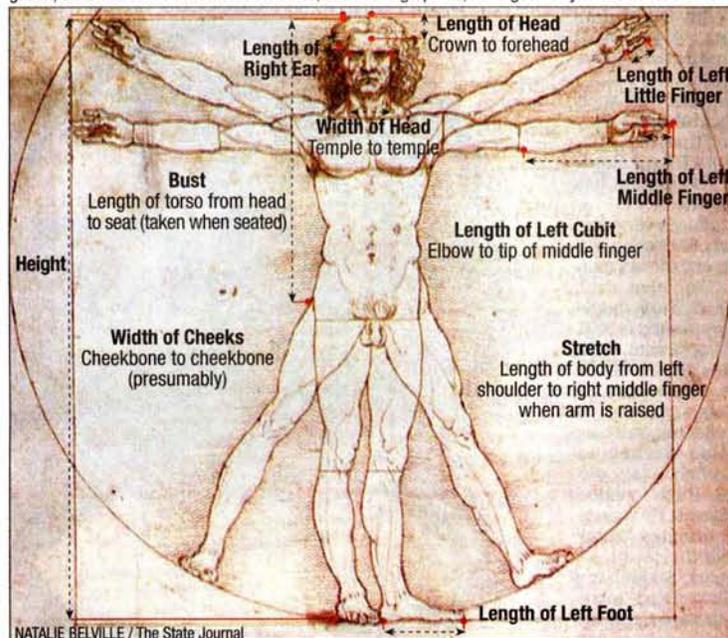
Woodward said in about 1880 led to the introduction of anthropometrics: a system of establishing identity through a carefully defined set of anatomical measurements.

"If we could get enough measurements of an individual — from the elbow to the tip of the index finger, the measurement of the ears, their width, their length," he explained, "we could get to a unique pattern for that individual."

Law enforcement authorities checked a suspect's anthropometric measurements against a card file that held measurements from previously convicted people.

### Measuring Up

Criminal justice systems in France, the U.K. and the U.S. relied on anthropometrics in the late 1800s. Trained operators took sets of 11 anatomical measurements that were presumed to identify each person uniquely. The measurements were time consuming to gather, and data cards had to be searched manually. The cumbersome system eventually was abandoned in favor of fingerprints. These days, computers gather, store and search modern biometrics, such as fingerprints, hand geometry and facial structure.



The system returned many successes.

It was, Woodward said, an early attempt at biometrics and a complicated one, too. Operators had to be specially trained and use special equipment. Checking the database was time-consuming. No one left anthropometric clues at the crime scene. And along with the suc-

cesses, error rates were high.

Then, Woodward said, fingerprints were used for the first time in 1902 in Britain to send a criminal to the gallows.

The new system began to overtake anthropometrics.

**J. Edgar Hoover**, as a very young director of the U.S. Federal Bureau of Inves-

tigation, was probably the equivalent of a leading information technology expert of his day, according to Woodward. Hoover had worked as a clerk in the **Library of Congress** and understood data classification systems well. Recognizing the value of fingerprints, he maneuvered the FBI to become the nation's fingerprint repository.

Today, its Integrated Automated Fingerprint Identification System checks a database of more than 43 million 10-print records in less than two hours.

Fingerprints win, Woodward said. They're better.

The shift to fingerprints was controversial, Woodward said.

"It took a lot of time and effort to get fingerprints recognized as the standard, and then, once they were recognized as the standard, to organize the political and bureaucratic structure necessary to support fingerprint identification."

In Woodward's view, the use of fingerprints for criminal justice represented a paradigm shift in how identification technologies are used.

Now, he added, we are undergoing another paradigm shift, toward the use of biometrics for access control.

"Instead of basing identification on something that you have — a token, a key, a pass — instead of basing identification on something that you know — a password, a secret code — you base identification on something that you inherently are."

One day, he said, using a biometric to log on to a computer, make a cell phone call, order an item from the Internet or get money from an ATM will be common.

But like the last paradigm shift, he added, this one will not happen overnight. It will once again take time, effort, scientific and technical innovation, bureaucratic maneuvering and government support.

"Society does not turn on a dime," he said. "Patience is required."

# Group Promotes North-Central Region for Biometrics Growth

By PAM KASEY

pkasey@statejournal.com

As the state's biometrics industry matures, a group of stakeholders is coming together to look ahead and ensure its future success.

The group met informally in Morgantown during the June European Biometrics Conference hosted by the West Virginia Development Office and the West Virginia High Technology Consortium Foundation.

"Right now, we're at a crossroads," said Jack Gocke, director of the WVDO's European office, in an interview after that meeting.

"We still have a few more years left of government opportunities, selling to the federal government, which is going to be buying on a massive scale in the next few years for the US-VISIT (border security) program and things like that," Gocke said.

"But then, if we focus only on the government, we're going to be left without an industry in a few years," he continued. "So we also have to have a strategic plan for diversifying and growing our own companies to approach the U.S. commercial markets."

Banking and finance, health care and other commercial applications where the real biometrics markets are going to be in the long run, Gocke said.

Jim Estep, president and CEO of the West Virginia High Technology Consortium Foundation, agreed.

"If we have the right resources here so companies can get started that are providing biometrics solutions to banks and to hospitals and to shopping malls, we could capitalize on that and then we'd truly start living up to the claim of being the 'Silicon Valley of biometrics,'" Estep

said. "We've got all the basic ingredients — it's ours to lose — but there's still a lot of work to be done."

Gocke said north-central West Virginia needs a strategic plan.

"We need a marketing plan, to reach outside of the state to draw the companies here; we need a development plan for our own companies, to grow our own companies here," he said.

To follow up on that June meeting, the I-79 Development Council has invited Massachusetts Institute Technology professor Dr. Richard Lester to speak at its meeting in September.

"Last year, (Lester) conducted a study of economic development in north-central

West Virginia for the Benedum Foundation," explained Ralph Bean, chairman of the council.

"One of the industries that he looked at was biometrics," Bean said. "And the Benedum Foundation has consented to let him present his report to our group."

Afterward, Bean proposed to formalize a committee to plan for the future of the region's biometrics industry.

"And as part of that, we'll need to do a complete strategy, including a full competitive analysis," Bean said, comparing West Virginia's strengths and weaknesses with those of other areas developing biometrics industries.

Gocke also would like to see this process

come out of a position for a point person.

"If a company says, 'Yeah, we need to locate a facility in the U.S., somewhere on the east coast, we're growing very quickly, we're going to create 50 jobs,' who do you turn that over to right now?" Gocke asked.

"There's just not a lot of people in the state who are charged with taking responsibility for that company and acting as the host from the state," he added. "We need somebody, a person to implement it all, to act as the focus point, the access point, the apex of all the resources we have available for helping our own companies grow and bringing in companies from outside."



www.statejournal.com

## Annual Conference To Showcase W.Va. Talent

By PAM KASEY

pkasey@statejournal.com

West Virginia will play a larger role than ever this year in the upcoming Biometric Consortium Conference, which is scheduled for Sept. 20-22 in Arlington, Va.

Hosted each year by the Biometric Consortium, a partnership between the National Institute of Standards and Technology and the National Security Agency, the conference is co-sponsored for a fourth year by the West Virginia Development Office with strong participation from West Virginia University.

"I've been to other conferences. I've gone to other working groups; this is one of the largest in the country, if not the largest," said Jamie Gaucher, technology development manager for the WVDO. "It's a collection of biometrics-focused entities: not only people doing research,

but people within the business community, people within government. From an economic development perspective, it makes sense for us to be in that mix."

One of three ongoing tracks at the conference will be an academic research symposium organized and hosted by the Biometrics Knowledge Center at WVU.

In this second year that the BKNC has hosted the research symposium, a major focus will be performance valuation of biometrics, an issue BKNC Director Edwin Rood said is a major hurdle right now.

"Biometrics deals with humans, it deals with measurements, but in many respects it's a statistical process," Rood said.

Private-sector applications, Rood explained, often will ask the relatively simple question: "Are you who you say

you are?" meaning, does an individual's fingerprint match the one on his ATM card, or does his facial scan match one in a database of those who are authorized to enter this building? This is a one-to-one or maybe a one-to-thousands comparison.

But government applications, he said, often will ask a second, more complex question, "Are you also someone else?" and has an individual come into the United States under another identity from the past? This question requires comparing a biometric to a database of millions.

"Even though accuracy may be almost 100 percent, inaccuracy being just a fraction of a percent, if you multiply that fraction times a very large number, you get a fairly

PLEASE SEE CONFERENCE, PAGE 5

## CONFERENCE

CONTINUED FROM PAGE 4

substantial number of people who have been mismatched," Rood said. "So we're trying to learn what the statistical dynamics are of biometrics at the small scale and how to extrapolate that to a large scale."

Performance valuation is one of many questions currently under research that will guide the establishment of international standards for biometrics.

The research symposium also will include a poster session where researchers present their work simultaneously in a more interactive fashion, a big draw for the conference.

Biometrics technologies, performance valuation, societal implications and economic costs and consequences will be research areas presented at the poster session, Rood said.

Representatives from the Biometrics Fusion Center, the National Biometric Security Project and other West Virginia biometrics organizations also will attend.

Gaucher of the Development Office sees the conference as an important opportunity to show off West Virginia's biometrics assets.

"The biometrics community is much larger in the state of West Virginia today than it was three years ago," he said.

"The National Biometric Security Project, for example, did not exist, and the Department of Defense was still working on exactly what the Biometrics Fusion Center was going to be. Some of those things have come into focus," he continued. "The opportunity to communicate that success, to illustrate to others that they can come to West Virginia, be successful, and have access to resources like that — that's something I'm very excited about."

## Biometrics Groups Establish Operations in Morgantown

By PAM KASEY

pkasey@statejournal.com

MORGANTOWN — Taking advantage of West Virginia's proximity to the nation's capital, the **National Biometric Security Project** maintains headquarters near funders and clients in Washington, D.C. — but conducts the majority of its work in Morgantown.

An easy, if oversimplified way to understand the role of the NBSP is to think of it as the counterpart to the **Biometrics Fusion Center** in Clarksburg. While the BFC works as the biometrics testing and evaluation unit of the **Department of Defense**, the NBSP performs a similar function for non-defense government agencies and the private sector.

The idea for the NBSP came about after Sept. 11, 2001, according to Senior Vice President **Michael T. Yura**.

Yura was director of the Forensic Identification Program at **West Virginia University** at the time. In working to create the world's first degree programs in forensic and investigative science and in biometric systems, Yura had formed relationships with government agencies and with the biometrics industry.

While the Department of Defense locked down its facilities immediately after the events of Sept. 11, Yura and his government and industry colleagues "looked and said, 'Who's handling civilian airports? Who's handling all these other things that had nothing to do with the Department of Defense?'"

They agreed that, although they couldn't have prevented Sept. 11, they could have improved the aftermath if they'd had an organization that could respond quickly and credibly to the needs of agencies like

the **Transportation Security Administration** and the **Federal Aviation Administration**, or of the nuclear power and other critical infrastructure industries.

Using the model of government, industry and academic collaboration under crisis established during World War II, Yura said, the partners approached the **U.S. Congressional Intelligence Committee** for support and quickly formed the nonprofit NBSP.

Although the organization is headquartered in Washington, Yura said, north-central West Virginia's biometrics resources made Morgantown a natural for the organization's main operations.

The NBSP acts in some ways as a think tank. For example, it reviews academic programs nationwide to see that a diverse biometrics work force is created and that, until an accreditation becomes

available, academic programs cover what is needed.

It acts as a clearinghouse, creating a database of "everything biometric" that includes all known international sources of biometric-based identification technology.

It assists the **National Institute of Standards and Technology** in developing standards for biometrics technologies, it evaluates whether biometrics products perform as advertised and, under contract, it assists government agencies and private companies in identifying and implementing biometric solutions to security problems.

Yura said his colleagues in Washington, D.C., have been stunned at the support the NBSP has received from West Virginia and from Morgantown.

The state jumpstarted the organization with an economic development grant of \$2.3 million for the purchase of state-of-the-art laboratory equipment that now occupies the organization's 8,000-square-foot offices in Morgantown's Wharf District.

While that grant was on hold, Morgantown developer **Parry Petroplus** offered to build out the NBSP's office space at his own expense, Yura said, as a show of faith in the project.

At another time, the city of Morgantown even discontinued a construction project during a conference the NBSP hosted so conference participants would not be inconvenienced.

The NBSP currently employs 12 and expects to employ 18 by the end of the year; but Yura estimated the organization's employment at more like 40 when he counts graduate students and employees under sub-contract. He expects to expand soon and has an option on another floor of office space.

Down the road, he sees almost limitless possibilities for growth as schools and colleges, financial markets and others increasingly seek biometric security applications.