

Corrections Data Mining

Scattered among the thousands of inmates in a State's correctional system are a few who receive monthly visits from the same woman. Shortly after she makes her visits, these inmates deposit large sums of money. Because the inmates are in different facilities, no one notices that the woman is one inmate's "aunt," another inmate's "wife," and yet another inmate's "sister." Soon, however, a National Institute of Justice (NIJ) initiative, the Corrections/Law Enforcement Intelligence Gathering and Sharing Project, will help correctional administrators identify and evaluate data analysis/data mining software to sort through massive amounts of information from different sources to find patterns and in turn share information and partner with law enforcement to stop, and even prevent, crime.

Today's age of information technology could also be called an age of information overload. With so much information at everyone's fingertips, finding and sharing the right information has become critical. Data analysis/data mining tools make it easier to analyze the vast amounts of information contained in large databases by finding patterns and deviations much more quickly than any team of analysts. Many corrections departments want to move toward adding these tools to their intelligence operations, but they feel uncertain about which steps to take next and criteria to use. The goal of NIJ's Intelligence Gathering and Sharing Project is to make the selection and implementation process easier.

As part of that project, a team of information technology experts from NIJ's Border Research and

Technology Center (BRTC), part of the National Law Enforcement and Corrections Technology Center system, and its technical partner, the Space and Naval Warfare Systems Center—San Diego (SSC—SD), go through the same data analysis/data mining tool selection process faced by corrections departments. The project will eventually not only help correctional administrators across the country select the data analysis tools that meet their needs but also improve their intelligence gathering and sharing capabilities. Once the project is completed, the team will issue a report and offer a workshop on lessons learned.

Other major players in the project are State correctional personnel from Nebraska and Iowa, who say their departments already had information sharing projects but that NIJ's involvement smoothed the process and sped up their timetables. (Both States have project advisory teams that include local units of the FBI and U.S. Immigration and Customs Enforcement, as well as local law enforcement.)

"The project helped us increase our networking efforts even before the testing began, and that's what we want to see happen," says Laura Scheffert James, Iowa's Assistant Deputy Director for Eastern Operations. "If there is information we can provide that will be of benefit to other agencies, there will also be benefits for us. We see this as a two-way information flow. This particular project applies the [analysis] tool to our database, and it will impact what information we can make available. However, the biggest benefit to us comes from the whole process of learning what our partners need—of learning what information is most pertinent to them."

"NIJ is giving us good feedback and good ideas and keeping us focused," says B.J. Spring, administrative assistant in the Intelligence Division at the Nebraska Department of Correctional Services. "The sharing will happen in a better fashion than if we had just muddled through it ourselves."

BRTC's Dr. Wadad Brooke Dubbleday says the project has shown her that much of what happens within jails and corrections facilities influences what happens on the outside. "Corrections may be able to share information with law enforcement, and it will turn out that each had a piece of the puzzle, and the picture is now complete," she says.

The completed picture includes pieces provided by the mining and analysis software, which finds previously undiscovered relationships and patterns, enabling both corrections and law enforcement to use their resources more effectively and intelligence analysts to perform their jobs at a higher level. In Nebraska, reaching that higher level became a long-term goal several years ago when the State created Spring's position with the specific assignment of compiling statistics potentially related to drug use and looking for patterns. Although Spring and his analysts had recorded some success, he says the

BorderTrack

A new product or technology can be the tangible answer to the question of how public safety agencies could do things better, faster, safer. But that product has to get into the right hands before it can fulfill its promise; and because of other priorities, time constraints, or lack of appropriate collaborators, that does not often happen.

Every now and then, however, the right people connect, the pieces fit, and results happen—results such as the BorderTrack GPS Position Indicator, a technologically sophisticated and still evolving system that grew from questions stirred up during a simple demonstration of laser range-finder binoculars.

When Major Billy Asbell of the National Guard Bureau gave a presentation on laser



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NIJ project came along just when Nebraska wanted to move on. Before involvement with the NIJ project, Nebraska had compiled databases on—

- Incidents suspected of having a drug-related link.
- Exchanges of large amounts of cash.
- Suspicious phone calls (culled from reports on all phone calls by a manual review).

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- Visitors to inmates who had previously been flagged as exhibiting suspicious behavior.
- Account information.
- Vital statistics such as all inmates' height, weight, and date of birth.

When Nebraska became an evaluation site, these categories expanded and changed. The State now collects information on every visitor and every phone call, additional inmate incidents, and additional inmate identifiers such as scars, tattoos, and other marks. "With the addition of the analytical software, we hope we can take this copious amount of information, run it through the process, and have it tell us something that we didn't already know—that it will draw some relationships we wouldn't have seen otherwise," Spring says. "Will it be something as precise as 'There will be a buy Thursday at 2?' We don't know, we are really anxious to see what it will do."

Iowa also had already collected similar information and expanded information-gathering efforts once the project began. "We saw that we have a great deal of information that can be of value to outside agencies. We view this as an opportunity to find out what information would be most useful to our outside partners and to expand those efforts," says Scheffert James.

With the thought of expanding those efforts, Iowa decided to place access to data mining and analysis on the desktop of every member of the project advisory team and all department of corrections intelligence officers. Iowa also gives access to other investigators who need to analyze data related to a specific case. In Nebraska, the chief information officer at each facility and the investigative team analysts received access. "We wanted to put the tool in the hands of the actual users, the ones who would be taking the information and

conducting the investigations," Spring explains. "We wanted it at their fingertips, instead of making them rely on the central office to get information to them."

Although their approaches are similar, the Nebraska and Iowa programs currently run on separate tracks. "We were wondering if we would be able to interact, because we have common borders and are aware that activity certainly crosses State lines," Scheffert James says. She adds that Iowa asked about the possibility and was told it might be arranged in later stages of the program. "Such an interface would be an ideal situation," says Edward Lai, project technical lead from SSC-SD. "Once everything is completely set up and working the way we expect it to, if we can get both States together and get the data flowing between them, that would be an additional accomplishment over and above reaching the project objectives."

If interaction does not happen during the project itself, it will likely occur when the two departments of correction assume control of the data analysis tool. In addition, if other corrections agencies learn from the Nebraska/Iowa experience and set up their own data analysis systems, sharing may eventually take place among more than just those States.

State departments of correction interested in establishing their own data analysis projects will be able to obtain the final report of the project when it becomes available. These agencies also may attend a wrap-up workshop, which will promote data sharing and encourage replication of the project. For more information on the Corrections/Law Enforcement Intelligence Gathering and Sharing Project, contact Dr. Wadad Brooke Dumbleday at the Border Research and Technology Center, 888-656-BRTC or ubbelda@brtc.nlectc.org.



Corrections/Law Enforcement

Intelligence Gathering

and Sharing Project

The selection of evaluation sites and data analysis software for the Corrections/Law Enforcement Intelligence Gathering and Sharing Project resulted from a planned step-by-step process that ultimately will be part of the end product. Project participants knew that numerous data analysis/data mining applications already existed. However, because these applications can be complex and expensive to configure, operate, and maintain, law enforcement agencies and corrections facilities need assistance when it comes to selecting the right one. Therefore, the project team planned to meet three objectives:

- Identify state-of-the-art data analysis/data mining tools to improve intelligence gathering, analysis, and sharing in correctional environments.
- Select an evaluation site and a test tool.
- Prepare a publication describing the selection process and the lessons learned during the project to help others in the field make their own selections.

"We went through it pretty methodically . . . in the hopes that other departments of correction can apply this when selecting tools," explains Dr. Wadad Dumbleday of the Border Research and Technology Center. The final report, however, will not release the names of the evaluated products, in keeping with the National Institute of Justice (NIJ) policy not to endorse a particular vendor's technology.

The process started with a survey that was sent to every State department of corrections and a number of the Nation's larger jails. The project team compared responses to its criteria, which included—

- Preexisting use of an automated data capture system.
- Participation in the Criminal Justice Information System Initiative sponsored by the State Governor's office.
- Prior staff training in intelligence gathering and analysis.
- Commitment to assign intelligence and information technology staff to participate in the project.
- Agreement to create an onsite project advisory team that includes external law enforcement stakeholders.
- Willingness to train onsite staff in use of the tool and to participate in an after-action review and evaluation process.

The team narrowed the field by conducting telephone interviews and site visits before selecting Iowa and Nebraska.

The selection process for the data mining and analysis tool followed a similar pattern. Again, the team first developed selection criteria, including—

- Product features.
- Cost.
- Learning curve.
- Data requirements.
- System requirements.
- Vendor support.

Particular emphasis was placed on finding tools that included GIS (geographic information system) mapping capability, the ability to search free text for keywords, and a "transparent" structure that allows users to get similar query results no matter how the databases themselves are constructed. The team started with a broad-based process, in this case answering yes/no questions by visiting vendor websites. They then narrowed the field by compiling responses in a spreadsheet and finally inviting a few vendors to make presentations.

On selection, NIJ paid for licenses for each of the two tools for a year; after that, continued maintenance is the responsibility of the Iowa and Nebraska DOCs. Each State's intelligence analysts received training and each DOC improved its infrastructure as needed. Evaluations began in late summer 2004.

The final report, to be published in 2005, will outline the selection process, explain the ease or difficulty involved in learning to use the software, and list potential savings and lessons learned. On publication, the project team plans to hold a workshop for other DOCs that are interested in purchasing data analysis tools.



The Border Patrol has tested the device from a helicopter and generated results that were accurate within 100 meters, despite movement and vibration.

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range-finder binoculars to the advisory council of the National Institute of Justice's Border Research and Technology Center (BRTC), questions began racing through the mind of John Bott, a BRTC staff engineer. Asbell explained that National Guard personnel onboard helicopters used the binoculars to provide global positioning system (GPS) coordinates of marijuana fields growing in remote areas of Kentucky, enabling eradication teams to return to wipe out the crop. The National Guard, he said, was using military PLGR (precision lightweight GPS receiver) technology to provide the coordinates. This technology replaced the Guard's former system—a spotter marking an X on a paper map.

"Right then, I thought there could be other applications," Bott recalls. "I thought, if I ever had a chance to get my hands on a pair, I'd like to take them to a law enforcement agency and let them figure out how they might use them." When Bott finally got his chance, he learned that a pair of binoculars was already in the hands of a researcher at the Space and Naval Warfare Systems Center—San Diego (SSC-SD), the U.S. Navy's research, development, test and evaluation, engineering, and fleet support center for command, control, and communication systems and ocean surveillance. The Center also provides technical support to BRTC. Bott contacted the researcher and learned that SSC-SD had already adapted the laser range-finder binoculars for use by Navy Special Forces, adding laptop capability

and replacing PLGR with a more readily available commercial GPS system.

"We were able to capitalize on the Navy's investment, and that allowed us to move forward with the law enforcement project," Bott says. The next step involved finding a law enforcement agency to test the device. He realized that tracking people or objects with GPS technology had little appeal in a major city like San Diego, where everything revolves around street addresses. However, the U.S. Border Patrol in San Diego does operate in remote areas. It became the first agency to express an interest in evaluating the system, which became known as BorderTrack.

Primarily developed by Scot McIntosh, a contractor supporting Bott and BRTC, BorderTrack incorporates a laptop computer and/or personal digital assistant (PDA) with the laser range-finder binoculars, enabling the user to sight on a target, obtain its GPS position, and generate a report. However, development did not end there; the system currently has three software options:

- **BorderTrack.** Combines GPS and laser range-finder output to pinpoint the location of a target; it also generates a popup reporting form that can be exported to a database.
- **LaserFind.** A simpler application of BorderTrack that yields just the target's location, which the user can either enter as a waypoint into a handheld GPS, plot on a paper

map, or enter into separate mapping software.

- **TeleMapper.** Adds mapping capability, locating the observer, the target, and a sightline between them on a map, enabling users to pick out commonly used roads and well-known geographic features.

TeleMapper comes in a laptop version only, whereas BorderTrack and LaserFind also have PDA versions. All software options, however, can display locations in various formats. In addition, a mount allows the user to use the binoculars with a thermal heat scope to generate even more precise readings, and a remote control capability enables the user to take cover or shelter after setting up the BorderTrack system at a good vantage point.

The Border Patrol has tested the device from a helicopter and generated results that were accurate within 100 meters, despite movement and vibration. Officers also field tested the binocular/scope mount and obtained more accurate results. BRTC plans further field testing with local law enforcement agencies. Additional innovations are in development, including advanced mapping capabilities and wireless data transmission. Mapping advances would add layers that could indicate, for example, well-known drug-smuggling routes or the location of every telephone booth in an area. BRTC has already established a wireless connection between the GPS receiver and the laptop/PDA, but the system still uses a cable to connect

the binoculars and the GPS; eventually, the cable may also disappear.

Although the right connections allowed the right pieces to come together to create BorderTrack, one key piece is missing: readily placing it in the hands of local law enforcement agencies, particularly in rural areas. "The binoculars are fairly expensive, so a lot of law enforcement agencies would not be able to buy them," Bott says. "I've talked to sheriffs' offices that were interested until they found out the price. We've also done market surveys to attempt to locate other, less expensive equipment that serves the same purpose but have located nothing that is comparable."

BRTC is exploring a way to put the last piece in place: adding the device to the Office of National Drug Control Policy (ONDCP)—Counterdrug Technology Assessment Center Technology Transfer program. Law enforcement agencies submit proposals to the program, and if approved, they receive equipment and training at no charge. Because BorderTrack can be used to trace drug trafficking activities, Bott believes it could be included in ONDCP's catalog of approved technologies, which would in turn grant access to the device to local law enforcement agencies. If that happens, the potential suggested by Major Asbell's presentation could be fulfilled.

For more information on the BorderTrack system, contact John Bott at 619-553-1283 or bottjp@spawar.navy.mil.

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Waste Not, Want Not

INMATES
AT WORK

If some correctional administrators never thought that a portable toilet primarily used by campers had a place in their facilities, they were not alone. Phillips Environmental Products, Inc., maker of the Portable Environmental Toilet™ (PETT), never did either. The idea of marketing a portable toilet to the correctional community did not occur to the company until the Office of Law Enforcement Technology Commercialization (OLETC), a program of the National Institute of Justice and part of the National Law Enforcement and Corrections Technology Center, became involved.

Wayne Barte, a senior project manager at OLETC, approached Phillips Environmental Products in November 2003 during the Montana Small Business Innovation Research Conference in Bozeman when he heard company representatives making a pitch for the portable toilet system to another conference attendee. "I went over, introduced myself, and said I could think of a couple of applications for the corrections field," Barte recalls. "I asked if they had ever given any thought to that market, and their answer was none."

Barte says he initially thought of the ever-present need to examine waste products for contraband. Inmates sometimes swallow balloons or other objects filled with substances such as cocaine, and a correctional officer has to search body waste for the item. Correctional staff often put an inmate suspected of smuggling alone in a cell and turn off the water to the toilet so that the waste can be trapped.

According to Barte, instead of water or chemicals, the PETT system uses a vegetable-based powder enclosed in plastic bags for individual use. The powder gels the waste products into a semisolid, whitish material. Barte thought officers could look at the bag's contents, feel the outside of the used bag to locate any contraband, and then extract it. The company found his ideas of interest and agreed to a demonstration of the product at the January 2004 meeting of OLETC's Advisory Council. In addition, Barte contacted the Northeastern Technology Product Assessment Committee (NTPAC), a regional forum that shares information about corrections technologies, to schedule a demonstration.

At the demonstrations, members of both groups saw how the portable toilet system works. PETT is about the same size as a

standard U.S. toilet, but it breaks down to approximately the size of a large briefcase. Each individual uses his or her own powder-filled removable plastic bag, which zips shut for transport away from remote sites. Because the double-layered, puncture-resistant bags are biodegradable, they can be placed in any garbage can. A privacy tent, which includes stakes and its own backpack carrying case, has a 4-foot-by-4-foot base. It weighs 6 pounds and fits into a tote, which also holds the toilet, bags, and other accessories and includes a special outside compartment dedicated to transporting used bags.

The deputy director of probation and parole for the State of New Mexico pointed out that the accompanying tent made the portable toilet perfect for road crews. Currently, he said, if someone needs to use the restroom, the whole crew has to stop working so that officers can load everyone up and take them to a restroom. "With the tent, they can pack it out and keep on working."

At both demonstrations, participants came up with more potential uses for the toilet. Diane Quinn, OLETC technology agent for corrections and the center's representative to NTPAC, says representatives brainstormed one use after another, including the following scenarios.

- ◆ In the event of a natural disaster, such as a flood, correctional facilities typically are not evacuated; rather, staff and inmates shelter in place. If the facility loses its running water, staff could set up the portable toilets.
- ◆ SWAT teams on training exercises typically spend extended periods in the wilderness. The lack of facilities can pose a problem, particularly for female personnel.

- ◆ Correctional officers transporting a prisoner often feel reluctant to stop at rest areas or at businesses because of the potential for escape attempts. The portable toilet system could be set up in the back of the transport vehicle.
- ◆ Law enforcement officers using a van on a stakeout could use a portable toilet.
- ◆ A member of the Chicago Police Department forensics unit, present at the Flight 93 crash site after the events of September 11, 2001, said that female Federal Bureau of Investigation agents at that site had no immediate access to facilities and that "having something like this would have made life a little better in a tough situation."
- ◆ A correctional facility that needs to establish a temporary guard post outside a building could easily put up the system and tent and then take it down when the post closed.

"Everybody who looks at it thinks of another use," Barte says. "We've had so many ideas, it's taken on a life of its own."

Although OLETC and NTPAC members thought of many uses, no one thought of any needed modifications. Barte and Quinn agree this is highly unusual, because members of both groups often ask vendors to make substantial modifications. (One small change that had been suggested in November 2003—having clear bags in addition to the original green—had already been implemented by the January 2004 demonstrations.) The only real concern that arose from the demonstrations was the effect of the gelling powder on latex items such as gloves. Quinn notes that the company completed a series of tests that confirmed the powder has no adverse effects.

The Office of Law Enforcement Technology Commercialization has deployed demonstration units of the Portable Environmental Toilet for evaluation to the New Mexico Department of Corrections, the Licking County (Ohio) Sheriff's Department, and the forensics unit of the Chicago (Illinois) Police Department. For more information, contact Dianne Quinn or Wayne Barte, 888-306-5382, or dquinn@oletc.org or wbarte@oletc.org.



The year: 1996. The place: Las Vegas, Nevada. The problem facing local enforcement: a series of 22 robberies. The challenge: to predict the location of robbery number 23 and to stop it. The solution: a software program that predicts animal movements, developed by researchers in Glacier Bay National Park, Alaska.

“I looked at the 22 robberies and I had a feeling that there must be a pattern. But to see that pattern was beyond my ability,” says Dan Helms, then a crime analyst with the Las Vegas Metropolitan Police Department. “So I tried to think of who would know more about predicting patterns than a crime analyst does.”

Helms sought information from a number of fields, including air traffic control and epidemiology (the scientific discipline that studies the incidence, distribution, and control of a disease in a population). He also phoned a friend who was working as a warden at Kruger Game Park in South Africa. “He had a number of different techniques he suggested that I could try,” Helms says. “So I laboriously set out to write a set of tools for the software I was using. Just when I had come up with something, which barely did what I wanted, he called me back to ask if I was really going to try the suggested techniques.”

If so, Helms continues, his friend wanted to direct him to the software, Animal Movement, developed by U.S. Government researchers at the Alaska Science Center—Biological Science Office in Glacier Bay National Park and available through the Internet. Helms put aside his own tools and used Animal Movement to make a prediction about robbery number 23. Based on that prediction, the perpetrator was arrested while he was casing the site.

“I was sold on the technology as soon as I’d seen it in action,” Helms says. “I didn’t expect to hit one out of the park on the very first try, but it sure did sell the rest of my department on it. I believe I was the first person to apply the tool to crime mapping, but its use is now widespread in crime analysis and many other disciplines.”

Animal Movement’s creators, Philip Hooge and Bill Eichenlaub, developed the program to study animal migration and movement patterns; however, the principles behind it also apply to the study of movements in general. Animal Movement is an extension that runs under versions 3.0 through 3.3 of ArcView®, a family of desktop geographic information system (GIS) software applications that enable users to visualize, analyze, and manipulate spatial information. The

Animal Movement extension includes more than 40 functions specifically designed to help analyze movements. The extension works under PC, Unix®, and Macintosh® operating systems and is available on the Internet as a free download at www.absc.usgs.gov/glba/gistools/index.htm.

“Since the tool itself is free, this is a huge advantage for law enforcement agencies, which have to decide very carefully how to spend every software dollar,” Helms says. Law enforcement agencies can take advantage of another “freebie” associated with Animal Movement—training from the Crime Mapping and Analysis Program (CMAP) at the National Institute of Justice’s National Law Enforcement and Corrections Technology Center—Rocky Mountain in Denver, Colorado. This federally subsidized training program also is offered to public safety personnel at

the Northeast Counterdrug Training Center at Fort Indiantown Gap National Guard Training Center in Pennsylvania. The program offers two different 40-hour, 5-day classes: Introduction to Crime Mapping covers the basics and Advanced GIS for Tactical Crime Analysis uses Animal Movement and other tools.

In the advanced class, students use sample data derived from actual crimes to determine movement and timing patterns, backcast to find the home location, forecast the next part of the pattern, and develop a response. The class not only teaches students how to identify data but also teaches them how to do something with that data, says Helms, who came to CMAP in 2002 to first design, then teach the course. “The advanced class has been very successful. We have had hundreds of students from numerous agencies,” Helms says. One student, Bill Edmonds

of the Colorado Springs Police Department, who took the training along with a colleague in 2002, remembers, “We came back and started applying this to crime patterns we were experiencing, particularly to residential burglary patterns.” Because Colorado Springs already used ArcView software, the department just needed to add the free extension, “which made it the right price for us.”

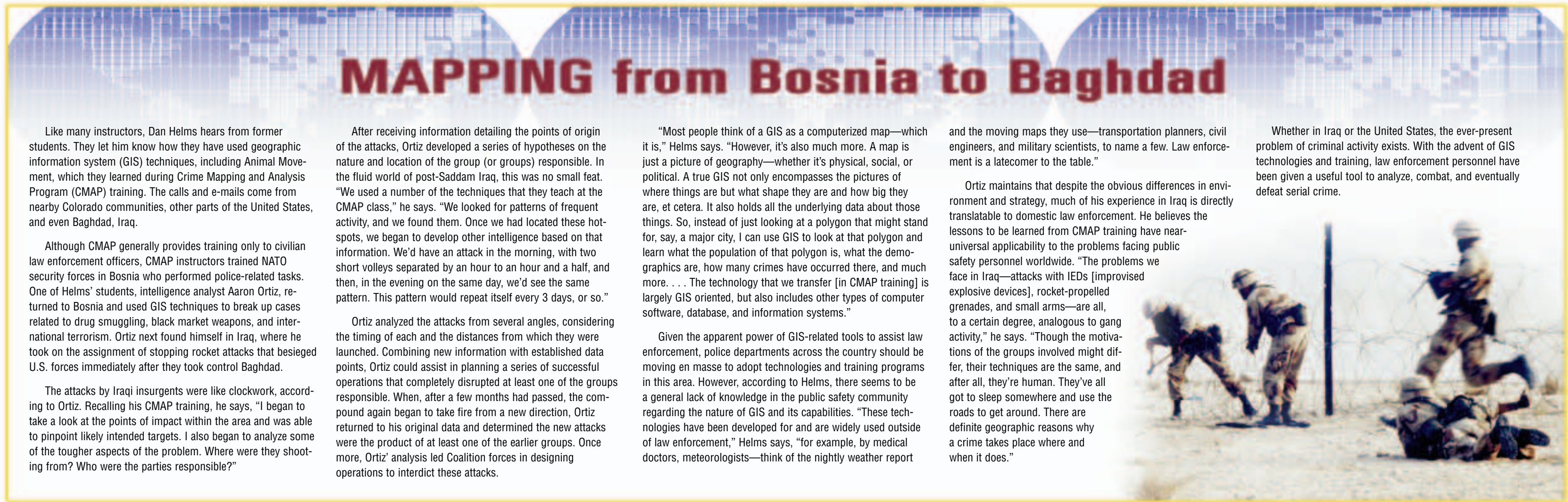
In the past 3 years, Colorado Springs has used Animal Movement to resolve 4 residential burglary cases involving approximately 200 incidents. “In one very successful instance,” Helms says, “the picture that emerged from the software showed us where the suspect lived within one block. Officers arrested him the same day we put out a bulletin suggesting he might live in that area. Another case involved commercial

burglaries of 64 minority-owned businesses. They took place all over town, although they were all located along major thoroughfares. We were able to narrow his residence down within a quarter-mile area.”

Edmonds adds that Colorado Springs has had cases in which Animal Movement was not successful: “What seems to be true is, if there are not a lot of incidents, specifically if there are fewer than 10, you don’t get good results.” With that in mind, Edmonds has found it best to use Animal Movement in conjunction with other tools, such as a program that analyzes times of incidents and makes predictions. “It’s not as though you just open a box and find an answer. These are tools, and you have to identify the set of tools that gives you the best answer.”

Helms used that approach when he first identified Animal Movement as a useful tool in 1996. Edmonds believes that more crime analysts should attempt to use lessons learned from other disciplines. “You don’t lose anything by trying something new. There could be techniques from other disciplines, such as epidemiology, that also could help us,” he says. “At CMAP, the program is really moving in the right direction. They are looking to move crime analysis beyond what it used to be.”

For more information and prerequisite requirements regarding crime mapping training classes provided by the Crime Mapping and Analysis Program, contact Danelle DiGiosio, 800-416-8036 or cmap@du.edu.



MAPPING from Bosnia to Baghdad

Like many instructors, Dan Helms hears from former students. They let him know how they have used geographic information system (GIS) techniques, including Animal Movement, which they learned during Crime Mapping and Analysis Program (CMAP) training. The calls and e-mails come from nearby Colorado communities, other parts of the United States, and even Baghdad, Iraq.

Although CMAP generally provides training only to civilian law enforcement officers, CMAP instructors trained NATO security forces in Bosnia who performed police-related tasks. One of Helms’ students, intelligence analyst Aaron Ortiz, returned to Bosnia and used GIS techniques to break up cases related to drug smuggling, black market weapons, and international terrorism. Ortiz next found himself in Iraq, where he took on the assignment of stopping rocket attacks that besieged U.S. forces immediately after they took control Baghdad.

The attacks by Iraqi insurgents were like clockwork, according to Ortiz. Recalling his CMAP training, he says, “I began to take a look at the points of impact within the area and was able to pinpoint likely intended targets. I also began to analyze some of the tougher aspects of the problem. Where were they shooting from? Who were the parties responsible?”

After receiving information detailing the points of origin of the attacks, Ortiz developed a series of hypotheses on the nature and location of the group (or groups) responsible. In the fluid world of post-Saddam Iraq, this was no small feat. “We used a number of the techniques that they teach at the CMAP class,” he says. “We looked for patterns of frequent activity, and we found them. Once we had located these hot-spots, we began to develop other intelligence based on that information. We’d have an attack in the morning, with two short volleys separated by an hour to an hour and a half, and then, in the evening on the same day, we’d see the same pattern. This pattern would repeat itself every 3 days, or so.”

Ortiz analyzed the attacks from several angles, considering the timing of each and the distances from which they were launched. Combining new information with established data points, Ortiz could assist in planning a series of successful operations that completely disrupted at least one of the groups responsible. When, after a few months had passed, the compound again began to take fire from a new direction, Ortiz returned to his original data and determined the new attacks were the product of at least one of the earlier groups. Once more, Ortiz’ analysis led Coalition forces in designing operations to interdict these attacks.

“Most people think of a GIS as a computerized map—which it is,” Helms says. “However, it’s also much more. A map is just a picture of geography—whether it’s physical, social, or political. A true GIS not only encompasses the pictures of where things are but what shape they are and how big they are, et cetera. It also holds all the underlying data about those things. So, instead of just looking at a polygon that might stand for, say, a major city, I can use GIS to look at that polygon and learn what the population of that polygon is, what the demographics are, how many crimes have occurred there, and much more. . . . The technology that we transfer [in CMAP training] is largely GIS oriented, but also includes other types of computer software, database, and information systems.”

Given the apparent power of GIS-related tools to assist law enforcement, police departments across the country should be moving en masse to adopt technologies and training programs in this area. However, according to Helms, there seems to be a general lack of knowledge in the public safety community regarding the nature of GIS and its capabilities. “These technologies have been developed for and are widely used outside of law enforcement,” Helms says, “for example, by medical doctors, meteorologists—think of the nightly weather report

and the moving maps they use—transportation planners, civil engineers, and military scientists, to name a few. Law enforcement is a latecomer to the table.”

Ortiz maintains that despite the obvious differences in environment and strategy, much of his experience in Iraq is directly translatable to domestic law enforcement. He believes the lessons to be learned from CMAP training have near-universal applicability to the problems facing public safety personnel worldwide. “The problems we face in Iraq—attacks with IEDs [improvised explosive devices], rocket-propelled grenades, and small arms—are all, to a certain degree, analogous to gang activity,” he says. “Though the motivations of the groups involved might differ, their techniques are the same, and after all, they’re human. They’ve all got to sleep somewhere and use the roads to get around. There are definite geographic reasons why a crime takes place where and when it does.”

Whether in Iraq or the United States, the ever-present problem of criminal activity exists. With the advent of GIS technologies and training, law enforcement personnel have been given a useful tool to analyze, combat, and eventually defeat serial crime.



the NLECTC 'center system'

The National Law Enforcement and Corrections Technology Center (NLECTC) system, a program of the National Institute of Justice (NIJ), offers no-cost assistance in helping agencies large and small implement current and emerging technologies.

The NLECTC system was established in 1994 by NIJ's Office of Science and Technology to deliver information and technology assistance to more than 18,000 police departments; 50 State correctional systems; thousands of prisons, jails, and parole and probation departments; and other public safety organizations.

With a network of regional centers and specialty offices located across the country, the NLECTC system has been able to deliver expertise in a number of technologies by forming partnerships with such host organizations as the Air Force Research Laboratory, the Space and Naval Warfare Systems Center, and The Aerospace Corporation. Through these partnerships, NLECTC staff have access to the latest innovations in research and development.

The NLECTC system serves as an "honest broker" resource for technology information, assistance, and expertise.

Contact NLECTC for:

Technology Identification

The NLECTC system provides information and assistance to help agencies determine the most appropriate and cost-effective technology to solve an administrative or operational problem. We deliver information relating to technology availability, performance, durability, reliability, safety, ease of use, customization capabilities, and interoperability.

Technology Assistance

Our staff serve as proxy scientists and engineers. Areas of assistance include unique evidence analysis (e.g., audio, video, computer, trace, and explosives), systems engineering, and communications and information systems support (e.g., interoperability, propagation studies, and vulnerability assessments).

Technology Implementation

We develop technology guides, best practices, and other information resources that are frequently leveraged from hands-on assistance projects and made available to other agencies.

Property Acquisition

We help departments take advantage of surplus property programs that make Federal excess and surplus property available to law enforcement and corrections personnel at little or no cost.

Equipment Testing

In cooperation with the Office of Law Enforcement Standards (OLES), we oversee the development of standards and a standards-based testing program in which equipment such as ballistic- and stab-resistant body armor, double-locking metallic handcuffs, and semiautomatic pistols is tested on a pass/fail basis. NLECTC also conducts comparative evaluations—testing equipment under field conditions—on patrol vehicles; patrol vehicle tires and replacement brake pads; and cut-, puncture-, and pathogen-resistant gloves. NLECTC also has evaluated emerging products to verify manufacturers' claims. The primary focus of OLES is the development of performance standards and testing methods to ensure that public safety equipment is safe, dependable, and effective.

Technology Demonstration

We introduce and demonstrate new and emerging technologies through such special events, conferences, and practical demonstrations as the Mock Prison Riot (technologies for corrections) and an annual public safety technology conference. On a limited basis, NLECTC facilitates deployment of new technologies to agencies for operational testing and evaluation.

Capacity Building

We provide hands-on demonstrations of the latest technologies to address such operational issues as crime and intelligence analysis, geographic information systems, explosives detection and disablement,

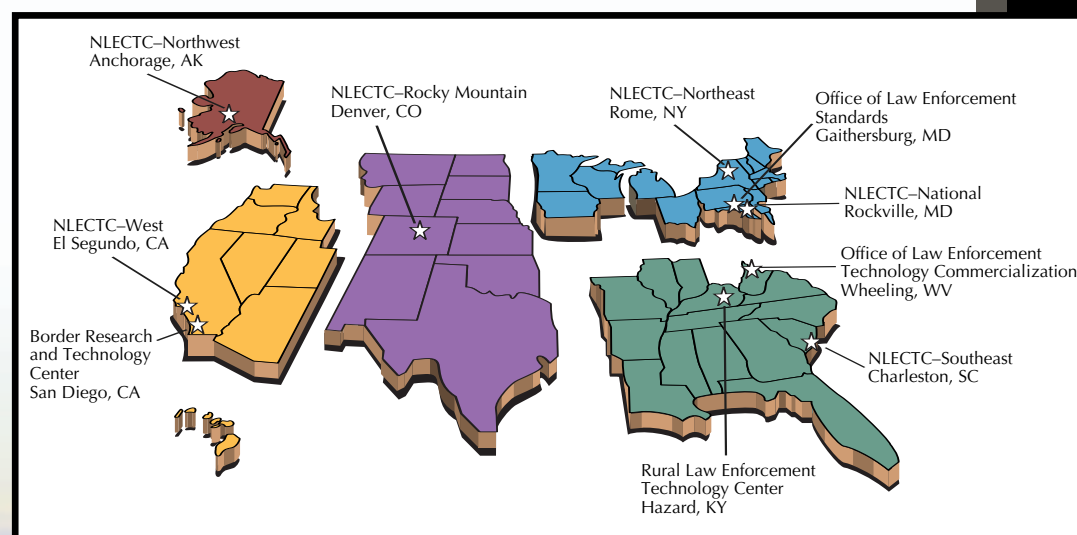
publications can be ordered through NLECTC's toll-free number, 800-248-2742, or via e-mail at asknlectc@nlectc.org.

Technology Commercialization

Our law enforcement and corrections professionals, product and commercialization managers, engineers, and technical and market research specialists work together to identify new technologies and product concepts. They then work with innovators and industry to develop, manufacture, and distribute these new, innovative products and technologies.

Technology Needs Assessment

Our national body of criminal justice professionals—the Law Enforcement and Corrections Technology Advisory Council



inmate disturbances and riots, and computer crime investigation.

Technology Information

NLECTC disseminates information to the criminal justice community at no cost through educational bulletins, equipment performance reports, guides, consumer product lists, news summaries, meeting/conference reports, videotapes, and CD-ROMs. NLECTC also publishes *TechBeat*, an award-winning quarterly newsmagazine. Most publications are available in electronic form through the Justice Technology Information Network (JUSTNET) at www.justnet.org. Hard copies of all

(LECTAC)—ensures that we are focusing on the real-world needs of public safety agencies.

Because most of the country's law enforcement and corrections services are provided at the local level, the NLECTC system is composed of five regional centers and is complemented by several specialty offices and a national center. Most centers and offices are collocated with or supported by federally funded technology partners so they can leverage unique science and engineering expertise.

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TECH shorts

Technology News Summary


TECHshorts is a sampling of the technology projects, programs, and initiatives being conducted by the National Institute of Justice and the centers and specialty offices that constitute its National Law Enforcement and Corrections Technology Center (NLECTC) system. If you would like additional information concerning any of the following TECHshorts, please refer to the specific point-of-contact information that is included at the end of each entry.

In addition to TECHshorts, an online, weekly technology news summary containing articles relating to technology developments in public safety that have appeared in newspapers, newsmagazines, and trade and professional journals is available through the NLECTC system's website, JUSTNET, at www.justnet.org. This service, the *Law Enforcement and Corrections Technology News Summary*, also is available through an electronic e-mail list, *JUSTNETNews*. Each week, subscribers to *JUSTNETNews* receive the news summary directly via e-mail. To subscribe to *JUSTNETNews*, e-mail your request to asknlectc@nlectc.org or call 800-248-2742.

Note: The mentioning of specific manufacturers or products in TECHshorts does not constitute the endorsement of the U.S. Department of Justice, National Institute of Justice, or the NLECTC system.

On the Trail of Sex Offenders, Kidnappers

NLECTC–West



In 2003, the Washington State legislature passed Senate Bill 5404, which directed the State's Department of Corrections (DOC), Department of Social and

Health Services, and Washington Association of Sheriffs and Police Chiefs (WASPC) to conduct a pilot project to track level-three sex offenders and kidnappers using passive data logging global positioning systems (GPS). The purpose of the field trials was to test the availability, reliability, and effectiveness of these electronic monitoring systems. WASPC and the DOC requested technology assistance from NLECTC–West with the project. The results of the field trials, in which one commercial product was evaluated, have been documented and are available in a final report published by the DOC. Key findings include: Battery life is important and may be impacted by the amount of time the offender is allowed to be in the community; false alarms about the bracelet being lost may depend on the type of bracelet; GPS signal acquisition may be difficult when leaving a building in an "urban canyon" or when riding on a bus; poor phone lines in an offender's living quarters (e.g., old hotels) may impact reporting to the monitoring station; and clothing may impact GPS reception. For more information and access to the report, contact Mike Epstein at NLECTC–West, 888-548-1618, epstein@law-west.org.

An Intelligence Center for the 21st Century

NLECTC–Northeast

A piece of information collected by a police officer might seem insignificant, but when combined with other pieces and further analyzed it may yield intelligence that could deter a crime or uncover a terrorist plot. The partnership of the law enforcement and intelligence communities is key to confronting today's complex criminal landscape. Prior to September 11, 2001, intelligence collection efforts were often informal and lacked structure. Today, however, a proactive approach to policing is needed and intelligence collection must include all Federal, State, county, and local agencies. The Upstate New York Regional Intelligence Center (UNYRIC), a multiagency, colocated intelligence center, collects, analyzes, and disseminates intelligence. It also makes relevant Federal counterterrorism information available in realtime to police officers and offers a model to guide information-sharing initiatives in other States. NLECTC–Northeast is partnering with the New York State Police to support a systematic method for defining how technology is applied and integrated (technology insertion) at the center. The technology insertion model involves planning and direction (determining what you need to know), collection (gathering what you do not know), analysis and production (transforming information into intelligence), and dissemination (releasing and delivering intelligence). For more information about UNYRIC and the support provided by NLECTC–Northeast, call 888-338-0584, ask for Maureen Regan, maureen.regan@dolphintech.com, or Deborah Cutler, debra@dolphintech.com.



Body Armor Safety Initiative

NLECTC–National

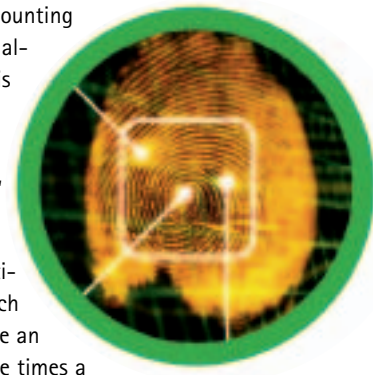
In response to concerns from the law enforcement community, the U.S. Department of Justice began an initiative that addresses the reliability of body armor used by law enforcement personnel and examines the future of bullet-resistant technology and testing. In conjunction with NLECTC–National



and the Office of Law Enforcement Standards, the National Institute of Justice is examining Zylon®-based bullet-resistant vests (both new and used) and reviewing the existing process by which bullet-resistant vests are certified. The results of the studies are being communicated as rapidly as possible to law enforcement and the public via a recently established webpage (www.ojp.usdoj.gov/nij/sciencetech/body_armor.htm). The webpage includes information about NIJ's research, official statements, and other resources on the topic of body armor safety. Law enforcement and corrections agencies seeking more information about the Body Armor Safety Initiative should contact NLECTC–National, 800-248-2742 or asknlectc@nlectc.org. Media inquiries should be directed to the Office of Communication, 202-307-0703 or askojp@ojp.usdoj.gov.

'Fingering' Inmates

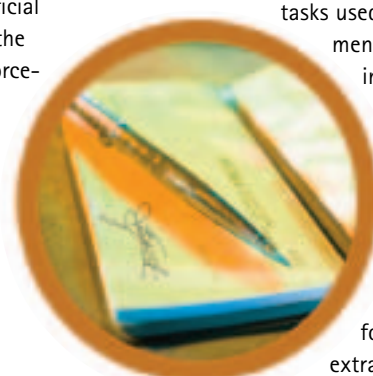
NLECTC–Southeast



Physically accounting for institutionalized inmates is critical. Currently in the United States, a manual count with physical identification of each inmate is done an average of five times a day. These counts are labor intensive and risky in terms of margin for error. They also present opportunities for inmates to frustrate and disrupt security efforts. Biometric identification using finger-imaging technology may be a viable alternative. NLECTC–Southeast, in partnership with Oak Ridge National Laboratory, is developing a portable biometric identification scanner as a tool to undertake inmate counts. The Southeast Center envisions that with a biometric counting system correctional officers will use handheld units to scan inmates' fingerprints and send them back to a central database, which will confirm the fingerprint as a match and, in less than 5 seconds, send back the inmate's mug shot for visual verification. As correctional officers complete their scanning rounds, the central unit or database will generate a report that indicates either all inmates have been accounted for or lists those who are missing. Although the biometric counting system may have little impact on the time it takes to perform an initial count, it will completely eliminate the need for second counts and rollcall counts. It also will immediately provide data on missing inmates. For more information about finger-imaging technology and its use in corrections, contact Rob Donlin, 800-292-4385 or donlin@nlectc-se.org.

Helping Hand for Handwriting Analysis

National Institute of Justice



Through funding from the National Institute of Justice, State University of New York (SUNY) researchers are developing a software system, called CEDAR-FOX, to perform tasks used by forensic document examiners (FDEs) in the examination of handwriting evidence (such as ransom notes, forged checks, etc.). CEDAR-FOX, which runs on Windows® platforms, automatically extracts and analyzes

(See TECHshorts, page 12)

It's Phishing Season



“Phishing” (pronounced: *fish-ing*) may lend itself to corny headlines, but it describes a serious, sophisticated practice in which Internet con artists—using bogus e-mails and websites designed to look like those of legitimate companies, banks, or government agencies—trick unwitting customers into divulging sensitive financial and personal information.

Staff at the CyberScience Laboratory (CSL) in Rome, New York, have been gathering information on this phishing epidemic for many months to share with law enforcement agencies throughout the United States. Funded by the National Institute of Justice to be a national resource center in the fight against cyber-crime, CSL has begun to get requests for training, assistance, and outreach on this proliferating online crime.

In a typical phishing scam, the perpetrator copies the webpage code from a well-known site (such as eBay®, Citibank, or AOL®) and uses it to set up a replica page, complete with company logo, fonts, styles, and links to mimic the real company webpages. He or she then uses spamming techniques to send a million or more e-mails with a single click. The e-mails advise Internet users that their billing information needs to be confirmed or updated because of a technical or security problem and directs them to click on a hyperlink to reach the official corporate or institutional website.

In actuality, the link sends them to the scammer's look-alike page. Once there, the user is asked to provide credit card information, password, personal identification number, Social Security number, mother's maiden name, and other closely guarded data. Armed with this information, the scammer can proceed to run up charges in the user's name, empty bank accounts, apply for loans or new credit cards, and commit many other types of identity theft.

According to the Anti-Phishing Working Group (APWG), an industry watchdog organization, consumer phishing attacks are on the rise. In April 2004, 1,125 unique new attacks were reported—an increase of 180 percent over the previous month. (The number of attacks may even be higher, because APWG can only report

the number of scams they hear about.) The group estimates that about 5 percent of phishing e-mail recipients “take the bait,” but if 1 million e-mails are sent out, 50,000 people will be victims.

Gartner, Inc. (<http://www4.gartner.com/InIt>), an information technology research firm, estimates that—

- More than 57 million Internet users in the United States have received some sort of e-mail related to a phishing scam.
- Close to 2 million checking accounts have been exploited.
- Annual losses associated with phishing exceed \$2 billion.

In July 2004, CSL's Jeffrey Isherwood discussed phishing scams at a meeting of the U.S. Secret Service's Electronic Crimes Task Force during a cybercrime seminar in Charlotte, North Carolina. Isherwood covered such topics as how to spot phishing e-mails, tools for analyzing e-mail headers and tracking phishing e-mail to its source, and the need for law enforcement agencies to educate the public about phishing.

“Public awareness is the key, as it is in [fighting] all types of crime,” says Isherwood. “People need to be suspicious of any e-mail that solicits credit card or other confidential information; that is not how legitimate companies work.” And he cautions that those receiving a phishing e-mail should not click on the hyperlink and should not send a hard copy to report the incident; rather, they should forward the e-mail as an attachment to an appropriate resource (see “If You Get Hooked . . .”). To trace a bogus e-mail, investigators need to “look under the hood” at the code beneath the headers to figure out its source—not a simple task. Phishing e-mails are often relayed through dozens of servers in an attempt to hide the sender's true location.

Law enforcement agencies interested in learning about the methods of phishing scammers and the resources available to thwart them can contact the CyberScience Laboratory at 888-338-0584 or register at www.cybersciencelab.com

If You Get Hooked . . .

If you receive a possible phishing e-mail, **do not** respond to it. Send copies of the e-mail to the Federal Trade Commission (FTC) at uce@ftc.gov and to the Anti-Phishing Working Group at reportphishing@antiphishing.org. Also send a copy of the e-mail to the “abuse” e-mail address at the company that is being spoofed (e.g., spoof@ebay.com).

If you have already disclosed your personal information to a possible phishing e-mail or website, immediately file an online complaint with the Internet Crime Complaint Center (a joint project of the FBI and the National White Collar Crime Center) at <http://www.ic3.gov>. Also go to the FTC's identity theft website at <http://www.consumer.gov/idtheft> and follow the directions there for reporting information to credit bureaus, credit card companies, and law enforcement.

In addition, an article titled “Protect Yourself Online” in the September 2004 edition (Vol. 69, No. 9) of *Consumer Reports* offers information and resources regarding phishing scams, computer viruses, junk e-mail (spam), and spyware.



RECENT publications

The following publications are available through the National Law Enforcement and Corrections Technology Center–National:



Michigan State Police Tests 2005 Patrol Vehicles. This bulletin summarizes the test results from the Michigan State Police 2005 model year patrol vehicle evaluations.



2005 Model Year Vehicle Evaluation. This equipment performance report contains the complete results of comprehensive tests conducted by the Michigan State Police on 2005 model year police patrol vehicles. Vehicles were subjected to major tests and evaluations, including vehicle dynamics testing, acceleration and top-speed testing, brake testing, ergonomics and communications evaluations, and fuel economy evaluations.



NLECTC Tests Walk-Through Metal Detectors for Public Safety Applications. This bulletin summarizes the results of testing performed on five models of walk-through metal detectors. The models were tested for compliance with the National Institute of Justice's walk-through metal detector standard. (This document is law enforcement sensitive. Requests for copies must be made on agency letterhead.)



Equipment Performance Report: Walk-Through Metal Detectors. This equipment performance report presents detailed results of testing performed on five models of walk-through metal detectors. The models were tested for compliance with the National Institute of Justice's walk-through metal detector standard. (This document is law enforcement sensitive. Requests for copies must be made on agency letterhead.)

To obtain the above publications, write
NLECTC, 2277 Research Boulevard,
Mail Stop 8J, Rockville, MD 20850;
telephone 800-248-2742; or e-mail asknlectc@nlectc.org.

Publications also can be downloaded from
JUSTNET at www.justnet.org unless otherwise noted.

National Criminal Justice Reference Service

In addition to funding the National Law Enforcement and Corrections Technology Center, the National Institute of Justice (NIJ) and other Federal agencies support the National Criminal Justice Reference Service (NCJRS), assisting a global community of policymakers, practitioners, researchers, and the general public with justice-related research, policies, and programs.

NCJRS offers reference and referral services, publications, onsite and offsite conference support, and other technical assistance. The easiest way to access NCJRS is online.

Start at <http://www.ncjrs.org>. The NCJRS website showcases the latest criminal and juvenile justice and drug policy information. Take advantage of—

- Topic-specific resources.
- Online registration and ordering.
- Searchable abstracts and calendar of events databases.

Stay informed. Register at <http://puborder.ncjrs.org/register> to receive—

- **NCJRS Catalog.** A bimonthly periodical that highlights recent publications and products and contains a convenient online order form.
- **JUSTINFO.** A biweekly electronic newsletter that includes links to full-text versions of printed publications.
- **E-mail notifications.** Periodic messages about new publications and resources that match your specific interests.

Ask questions. Share comments. Get answers to your questions or share suggestions about NCJRS services at—

- <http://askncjrs.ncjrs.org> (questions)
- <http://tellncjrs.ncjrs.org> (comments)

NCJRS Contact Information at a Glance

Web: <http://www.ncjrs.org>

Phone: 800-851-3420 (Monday – Friday, 10 a.m. to 6 p.m. e.s.t.)

Fax: 301-519-5212

Mail: NCJRS, P.O. Box 6000,
Rockville, MD 20849-6000



The National Law Enforcement and Corrections Technology Center is supported by Cooperative Agreement #96-MU-MU-K011 awarded by the

U.S. Department of Justice, National Institute of Justice. Analyses of test results do not represent product approval or endorsement by the National Institute of Justice, U.S. Department of Justice; the National Institute of Standards and Technology, U.S. Department of Commerce; or Aspen Systems Corporation. Points of view or opinions contained within this document are those of the authors and do not necessarily represent the official position or policies of the U.S. Department of Justice.

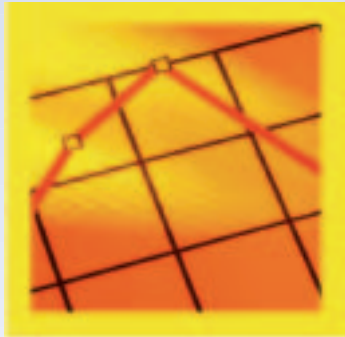
The National Institute of Justice is a component of the Office of Justice Programs, which also includes the Bureau of Justice Assistance, Bureau of Justice Statistics, Office of Juvenile Justice and Delinquency Prevention, and Office for Victims of Crime.

(TECHshorts . . . cont. from page 9)

handwriting features. It can compare a handwriting sample to a database or compare two handwriting samples to each other. The software system includes a mechanism for learning from writer samples, retrieval from a database of handwriting samples, and providing a measure of the strength of evidence in performing a handwriting match. The information processing model incorporates the methods used by FDEs, including the discriminating elements of handwriting (relative proportions of letter sizes, legibility, lexeme characteristics, etc.). It also addresses the individuality of handwriting and the error rates associated with determining whether two handwriting samples originated from the same writer. For more information, contact Dr. Sargur Hari Srihari, Center of Excellence for Document Analysis and Recognition, SUNY at Buffalo, 716-645-6164, ext. 113, or srihari@cedar.buffalo.edu.

Crossing the Boundary With Data Analysis

NLECTC-Rocky Mountain



A white paper detailing the Kansas City Regional Crime Analysis Geographic Information System (KCRCAGIS) project is available from NLECTC-Rocky Mountain. The

KCRCAGIS project is a cooperative effort between the Rocky Mountain Center and a group of nine police departments from the Kansas City, Kansas, and Kansas City, Missouri area. The goal of KCRCAGIS is to develop a system to help different departments within a given geographic region to securely share crime analysis data in numerous different formats via the Internet. According to NLECTC-Rocky Mountain, results have been impressive thus far. System participants now

have access to each other's data and can perform analyses on any events that occur, regardless of jurisdictional boundaries. Query capabilities include location, date, time, modus operandi, and suspect and vehicle information. For a copy of the white paper or more information, contact Danelle DiGiosio, 800-416-8036, cmmap@du.edu.

Calling Inspector Raman

Office of Law Enforcement Technology Commercialization

The Office of Law Enforcement Technology Commercialization (OLETC) is assisting Wyoming-based company DeltaNu in the commercialization of a real-time, handheld crime scene investigation laboratory called Inspector Raman™. The device uses Raman spectroscopy, a method of chemical analysis that enables real-time reaction monitoring and characterization of compounds in

noncontact manner. A sample is illuminated with a laser and the scattered light collected. The wavelengths and intensities of the scattered light can be used to accurately identify most chemical materials. Raman spectroscopy technology is already widely used in the chemical, polymer, semiconductor, and pharmaceutical industries because of its high information content and ability to avoid sample contamination. Currently, the device is under field evaluation by a major metropolitan law enforcement agency. It also was one of eight demonstration technologies presented at the September 2004 meeting of OLETC's

Advisory Council. In addition, representatives of DeltaNu attended OLETC's Commercialization Planning Workshop®. For more information about Inspector Raman or commercialization assistance provided by OLETC, contact Wayne Barte, 888-306-5382 or wbarte@oletc.org.



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