

NEWSLINK

FEDERAL LABORATORY CONSORTIUM FOR TECHNOLOGY TRANSFER

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Innovations in Law Enforcement

As the criminal justice community prepares for the 21st century, many managers realize they can no longer do business as usual—relying on in-house expertise to stay abreast of technological advances. Thus, significant partnerships are being formed among police agencies, academia, and federal labs/agencies to develop technologies that meet law enforcement needs.

The past decade has been a time of sustained development for law enforcement technologies. From polylights that identify substances and fingerprints invisible to the eye, to advanced methods for securing fingerprints, to the innovative use of cell phones to provide real-time reporting of traffic incidences, law enforcement has never been more high tech.

Technology Priorities

A 1999 survey conducted with the Massachusetts Chiefs of Police Association identified top priorities for law enforcement technology. In all, 167 police chiefs ranked technologies on a scale of 1 to 5 (with 5 being the highest priority). The results are shown in Table 1.

As Table 1 indicates, police chiefs were most interested in technologies that had the greatest impact on their daily activities. Any cost-effective technology in these areas has great potential to be marketed to the law enforcement community. In late 1998, the Center for Technology Commercialization (CTC—one of NASA's Regional Technology Transfer Centers) conducted a seminar for Massachusetts police chiefs that identified specific technology needs and requirements. As a result, several technologies are currently being matched with R&D conducted at NASA's Goddard Space Flight Center:

- ◆ video capture analysis—software and hardware
- ◆ photography—high-resolution digital image devices and image analysis software and weatherproof camera housings

Table 1. Rank of Law Enforcement Technologies

Technology	Average Rank
Officer protection	4.455
Crime scene investigation technology	3.887
Less than lethal incapacitation	3.784
Information technology for community policing ..	3.707
Information management	3.700
Vehicle stopping technology	3.689
Secure communications	3.671
Surveillance equipment/technology	3.623
Radio communication interoperability	3.605
Noninvasive drug detection	3.509
Nonintrusive, concealed weapons and contraband detection	3.419
DNA evidence collection and testing	3.365
Crime lab technology enhancements	3.330
Crime mapping	3.024
Location and tracking	2.874
Counterterrorism	2.575

- ◆ remote latent fingerprint identification technology
- ◆ project management software tools to analyze regional crime to identify crime trends and predict future crime locations
- ◆ advanced Global Positioning Systems (GPS) to help identify stolen vehicles, locate money stolen from banks, and track convicts on work release.

Experts Converge to Improve Hearing Assistance Products

In early June, more than 90 manufacturers, researchers, clinicians, government officials, advanced technology developers, and people with hearing disabilities will gather in New York City to pool their expertise in a "Stakeholders Forum on Hearing Assistance Technology" (SFHAT). The forum will identify and validate unmet consumer needs, business opportunities, and specifications—with the anticipated outcome being the introduction of innovative products and technologies that will have a significant and positive impact on persons with hearing disabilities. Identifying technology needs *before* seeking out and applying existing technologies is called "demand-pull" technology transfer.

The forum is being hosted by the Rehabilitation Engineering Research Center on Hearing Enhancement and Assistive Technology (Hearing-RERC) at the Lexington Center for the Deaf in partnership with the

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The Law Enforcement Market

Most police departments do not have the budget to purchase new technologies. Even small departments in well-off communities are unlikely to

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INSIDE

This issue of *NewsLink* focuses on **LAW ENFORCEMENT** and **ASSISTIVE TECHNOLOGY**. The June issue will focus on electronics, sensors, and photonics.

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have large procurement budgets. Estimates indicate that more than 95% of available resources is spent on the basics (such as personnel and support infrastructure), and the remaining 5% is spent on basic tools such as cars, weapons, and radios.

An analysis of expenditure trends reveals that direct expenditures for major criminal justice functions have been increasing and that states now spend more on criminal justice than municipalities, counties, or the federal government. However, there is an upward trend in federal support for law enforcement technology programs, and the Clinton Administration and Congress have begun focusing on the need to modernize law enforcement.

Federal Support

Through its **Office of Science and Technology**, the **Department of Justice's National Institute of Justice (NIJ)** manages more than \$100 million of programs annually. In addition, funds are routinely transferred to NIJ to manage the technology initiatives of other federal agencies. Thus, NIJ has rapidly become the lead organization in the area of research, development, testing, evaluation, and commercialization of law enforcement technology. This trend appears to be increasing as the NIJ budget expands to address first responder and counterterrorism technology, advanced distributive learning, and school safety and security.

Beginning in FY1998, Congress authorized using 20% of the \$5-billion Community Oriented Policing (COPS) Program to purchase equipment and technologies. In FY1999, \$90 million was earmarked for this purpose. The federal government's support of new technologies is also evident in the Local Law Enforcement Block Grant Program—which increased from \$505 million in 1996 to \$523 million today. Managed by the **Bureau of Justice Assistance**, approximately 79% of these grants are used for personnel, technology, and equipment.



Driving Force

NIJ's Office of Science and Technology has been the primary reason for the increased use of technology in the law enforcement community. The driving forces have been the establishment of the **National Law Enforcement and Corrections Technology Center (NLECTC)** in Rockville, MD; five regional centers throughout the U.S.; and three specialty centers for standards, commercialization, and forensic science. NLECTC's mission is to provide technology information, assistance, and expertise to help the nation's law enforcement, corrections, and criminal justice communities. Its primary goals are to:

- ◆ maintain awareness of criminal justice operational needs
- ◆ maintain awareness of the state-of-the-art in technologies
- ◆ ensure regular communication between the user and technical communities
- ◆ facilitate the development, evaluation, and implementation of appropriate technologies.

Because most police agencies do not have the resources to develop cutting-edge technologies themselves, NIJ's Office of Science and Technology provides the means for gathering information on their needs and presenting this data to industry, federal labs, and academia to develop the appropriate responses. Although a seemingly monumental task, a great deal of success has been achieved in a short period of time via critical partnerships developed with universities, the **Department of Defense (DOD)**, **NASA**, the **Department of Energy (DOE)**, and other U.S. labs. In addition, NIJ's strong connection to its customer base through national and regional advisory committees, seminars, and conferences will ensure that the new millennium brings customer-focused public safety technology, policies to guide its use, and the training to assist in this change of culture and methods. **NL**

For more info: Lt. Colonel Thomas J. Kennedy, CTC, 508-870-0042 x110, tkennedy@ctc.org; www.ojp.usdoj.gov/nij/about_sci.htm

HEARING *from p. 1*

Rehabilitation Engineering Research Center on Technology Transfer (T2-RERC) at the **State University of New York at Buffalo**. Other sponsors include the **National Institute on Disability and Rehabilitation Research (NIDRR)** and the **FLC's Northeast Region**.

Identified Technology Areas

In preparation for the forum, a group of stakeholders (including end-users, manufacturers, researchers, and clinicians) participated in interviews and panels that reviewed the state-of-the-practice for hearing aids and Assistive Listening Systems (ALS). Four technology areas were identified as having significant potential for improvement:

- ◆ earmolds (portion of the hearing aid inserted in the ear canal)
- ◆ infrared and inductive loop ALS
- ◆ wireless communication and FM broadcast systems
- ◆ microphones and directional microphone arrays.

Industry profiles are being written for the hearing aid and ALS markets, and "white papers" are being prepared for the four technology areas. The white papers will summarize customer needs, business opportunities to be realized, and the state-of-the-practice for each technology area.

Expected Outcomes

Based on the forum's outcome, the T2-RERC will develop "problem statements" to be disseminated to federal

Overview of Law Enforcement Technology Programs at Federal Labs

Many federal labs and agencies are developing new technologies to serve the needs of the law enforcement community. Here is a brief overview of a handful of these programs.

- ◆ **Air Force Research Lab Information Directorate**—developing (in conjunction with the NIJ's NLECTC-Northeast Region) a cyberscience lab to address technical issues related to cybercrime.
For more info: Francis Crumb, 315-330-3053, crumbf@rl.af.mil
- ◆ **Air Force Research Lab Information Directorate**—awarded a \$899,938 contract to **Research Associates for Defense Conversion, Inc.** to develop audio surveillance technology to assist military intelligence analysts and civilian law enforcement agencies.
For more info: Francis Crumb, 315-330-3053, crumbf@rl.af.mil
- ◆ **Argonne National Lab**—provides a “technology tour” highlighting the lab’s capabilities relevant to law enforcement, including item identification, human face recognition, expert systems for security, remote reconnaissance, and an intelligent gas sensor.
For more info: www.techtransfer.anl.gov/techtour/lawenforce.html
- ◆ **Counterdrug Technology Assessment Center**—serves as the central counterdrug enforcement R&D organization of the U.S. government. The program has four strategic thrusts: non-intrusive inspection, tactical operations support, wide area surveillance, and demand reduction.
For more info: www.epgctac.com/about
- ◆ **NIJ's Center for Civil Force Protection at Sandia National Labs**—offers a “virtual information booth” that provides advice on improving security against terrorism and facility features that could mitigate an attack in progress.
For more info: 888-577-4849, www.nlectc.org/ccfp
- ◆ **NIST**—supports the **Biometric Consortium**, which serves as the government’s focal point for R&D, test, evaluation, and application of biometric-based personal identification and verification technology.
For more info: www.biometrics.org
- ◆ **Oak Ridge National Lab**—developed a PC software package that enables local and federal crime fighters to more clearly see criminals and images captured on surveillance tapes.
For more info: Ron Walli, 423-576-0226, 9rw@ornl.gov
- ◆ **Pacific Northwest National Lab**—creating a unique facility to conduct comprehensive research on detecting and defending against cyber attacks.
For more info: www.pnl.gov/breakthroughs/fall99/critical.html#cyber
- ◆ **Pacific Northwest National Lab**—helped develop an interactive system that combines geographic information systems, laser mapping, and multimedia computing to assist with evidence collection in the field.
For more info: www.pnl.gov/breakthroughs/fall99/update.html#crime
- ◆ **Sandia National Labs**—providing a school security handbook (which was written by a Sandia scientist) on the World Wide Web.
For more info: www.doe.gov/schoolsecurity/pdf.htm
- ◆ **U.S. Navy**—serves as the Executive Agent for the **DOD Counterdrug Technology Development Program**, which develops technology and prototype systems to enhance the counterdrug capabilities of the DOD and civilian law enforcement agencies. **NL**
For more info: www.dodcounterdrug.com

HEARING *from p. 2*

—labs, manufacturers in cutting-edge industries, and other sources of technological innovation. Dissemination will include development of a web site, articles in trade publications, and contact with technology developers.

Once technology developers respond to the problem statements, RERC personnel will screen the submitted proposals. Commercialization packages will then be developed for the most promising proposals and offered to participating manufacturers for transfer or development.

Dr. Stephen M. Bauer—one of the forum organizers and co-director of the T2-RERC—is excited about the forum’s potential: “The technology transfer process permits us to leverage investments that have already been made in the nation’s science and technical base. Because it will permit us to target specific technologies that require substantial improvement, we expect the stakeholder forum to generate opportunities for applying breakthrough technologies to the hearing assistance industry.”

Brian Kon, President of **AZtech**, describes his organization’s contribution to the event as follows: “Our role in the forum will be translating the needs of the stakeholders into technical problem statements for use in identifying the new technologies and design ideas that can address those needs in a commercially viable product. It’s a unique chance for equipment consumers, researchers, third-party reimbursement agencies, and company representatives who rarely meet face-to-face to understand the implications of these developments to each others’ interests.”

The forum is scheduled to start at 12:00 noon on June 9 and will conclude at 5:00 p.m. on June 10. All forum events will take place at the Crown Plaza Hotel in East Elmhurst, NY (near LaGuardia Airport). **NL**

For more info: Douglas J. Usiak, 716-829-3141 x143, djusiak@acsu.buffalo.edu



TECHNOLOGY WATCH

Federal laboratory technologies available for technology transfer

Online Spinal Cord Rehabilitation

A new computer program could reduce some of the difficulties associated with a spinal cord injury by providing at-home rehab assistance. The **Rehabilitation Learning Center (RLC)** is a new online learning environment being established as a resource for spinal cord injury patients. It was the idea of **Dr. Anthony Margherita** of the **Washington University School of Medicine** in St. Louis, MO, who learned of a computer tool called Pachelbel™—a web-based education tool developed at the **DOE's Pacific Northwest National Lab (PNNL)** for the **National Security Agency**. The RLC uses the Pachelbel architecture to provide training and reference materials to patients working from a PC. Content ranges from types of spinal cord injuries to lifestyle changes to video instruction on correctly moving from a wheelchair to a bed. After being tested on spinal cord patients who had completed rehab, the RLC is now being tested on new rehab patients. PNNL and Dr. Margherita are actively seeking new partners or participants as they further develop the RLC and Pachelbel architecture.



For more info: www.neuro.wustl.edu/rlc

Bioactive Coating Lets Implants Bond with Bone

A biologically active glass that enables metal implants to bond with bone could extend the lifetime of artificial hips, knees, and other reconstructive devices. The bioactive glass coating is being developed at the **DOE's Lawrence Berkeley National Lab (LBNL)**. In the U.S., more than \$2 billion a year is spent on hip, knee, and dental implants; plates and pins for broken bones; and other reconstructions. Most implants today are made from either titanium-based alloys or alloys made from a mix of cobalt and chromium. Although both have excellent mechanical properties, neither can bond with bone—creating wear and tear that shortens implant lifetimes. LBNL scientists have developed a bioactive silicate glass and a simple “enameling procedure” whereby metal implants can be coated with micron-sized layers of the glass; these glass layers can then be fine-tuned at the metal-glass and glass-bone interfaces. The inexpensive process results in more durable and longer lasting implants.

For more info: Lynn Yarris, 510-486-5375, lyarris@lbl.gov

“Doctored Up” Cotton for Improved Healing

Innovative methods of altering cotton gauze to enhance the healing of chronic wounds are being developed by researchers at the **DOE's PNNL**, the **U.S. Department of Agriculture**, and **Virginia Commonwealth University's Medical College of Virginia Hospitals**. Approximately two

million Americans, including diabetics and those confined to beds and wheelchairs, suffer from nonhealing wounds. Studies show a link between chronic wounds and elevated levels of the enzyme elastase, which is known to degrade proteins required for tissue repair. This association prompted research into methods that alter cotton to remove elastase without sacrificing the material's valuable properties, such as absorbency and air permeability. In one approach, researchers synthesized a peptide “recognition site” for elastase on the cotton surface that absorbs the degradative enzyme away from the wound. The modified dressings will enter clinical trials in early 2000.

For more info: 888-375-PNNL, inquiry@pnl.gov

Sandia “Sniffers” Expand Abilities to Detect Explosives, Narcotics

Researchers at the **DOE's Sandia National Labs** have developed a hand-held gadget that—like a trained police dog—can sniff out the vanishingly faint odors of drugs and bombs at airports, border crossings, military installations, and schools. The portable device is a miniaturized version of an explosives-detecting walkthrough portal that Sandia developed for the **FAA**. The portal, which blows a puff of air over a passenger and checks for minute levels of explosives in the airflow, might soon be seen at U.S. airports as a security screening tool. Sandia has already developed a sandwich-sized chemical preconcentrator for the **FBI** that fits on the front of a commercial hand-carried ion mobility spectrometer (IMS). Now, rather than taking crime scene swipes of chemical particulates back to a lab for analysis, forensics investigators can place the swipes into the portable sniffer for “on the spot” analysis. The Sandia preconcentrator increases the sensitivity of the portable IMS—permitting it to detect less than a nanogram of explosives residue on a swipe. A second instrument using similar technologies can detect nanograms of explosives from several cubic feet of air drawn from the seams of a car trunk or school locker. This device might be useful for explosives detection at border crossings or during traffic stops. Research is now being conducted to see if the system can be modified to reliably detect narcotics.

For more info: Kevin Linker, 505-844-6999, kllinke@sandia.gov; www.sandia.gov/media/NewsRel/NR1999/sniffers.htm

Mini-Raman Lidar Has Numerous Uses

The **DOE's Brookhaven National Lab** is developing a short-range tool to screen for unknown substances (e.g., chemicals from nuclear, chemical, or biological weapons; narcotics; hazardous materials) in the field. The mini-Raman lidar system (MRLS) works at ranges of three feet to tens of feet—a significantly shorter distance than the several mile ranges typically associated with lidar. This shorter standoff distance provides first responders with a unique, noncontact tool for

TECH WATCH *continued*

interrogating and identifying unknown chemicals. In incidents involving suspected weapons or hazardous materials, emergency response personnel can accurately evaluate the situation and, instead of assuming “worst case” scenarios, can tailor their response to the chemicals actually present. MRLS can also map contamination areas—helping with crowd control, victim identification and decontamination, and cleanup activities. In addition, MRLS can be used to evaluate accidents involving hazardous materials, investigate environmental crimes, and document illegal handling and storage of toxic wastes. **NL**

For more info: Dorry Tooker, 516-344-2078, dorryt@bnl.gov

FLC Helps FEMA Fill Technology Needs

During the last three years, the FLC has been working with the **Federal Emergency Management Agency (FEMA)** to bring new technologies from the nation’s labs to first responders and emergency managers—with a goal of reducing the costs and impact of disasters. Here are some of the results of this collaboration.

- ◆ **Partnership Conference.** Working with FEMA’s **Partnerships and Outreach Division**, the FLC helps FEMA with its annual *Technology Partnerships for Emergency Management Workshop*. Started in 1996, this year’s event is scheduled for June 11-15 in Colorado Springs, CO. Bringing together first responders, emergency managers, federal labs, and the private sector, this year’s workshop will focus on wildfires, terrorism, and a host of other disasters.
For more info: www.nrel.gov/surviving_disaster
- ◆ **Emergency Warning Systems.** FEMA is working directly with federal labs to speed up the tech transfer process in high priority areas, especially emergency warning systems. Severe tornadoes, chemical/biological agent releases, and other disasters have prompted FEMA to reexamine how new warning technologies could save lives and reduce property damage. Working with **NASA Goddard Space Flight Center (NASA-GSFC)** and the **MITRE Corp.** (a federally funded research center), FEMA has identified two promising technologies—Earth Alert (NASA-GSFC) and MITREcast—that can provide more accurate and speedier warnings. If implemented, 99% of the U.S. population would be covered.
For more info: Dr. James Grichar, 540-542-3079, James.Grichar@fema.gov
- ◆ **Collaboration with NTTC.** To conduct a more systematic tech transfer program, FEMA entered into a \$1.5 million cooperative agreement with the **National Technology Transfer Center (NTTC)** to identify user needs, canvass federal agencies to avoid duplication of effort, identify technologies to solve problems, and recruit private sector partners to produce new goods and services for the emergency management and first responder communities. FLC Chair **Dan Brand** helped to get the process moving by hosting a start-up meeting. **NL**
For more info: Dr. James Grichar, 540-542-3079, James.Grichar@fema.gov

Super Sensor:
Brookhaven
National Laboratory
researchers Arthur
Sedlacek (left,
foreground) and
Mark Ray inspect
the portable mini
sensor, while Ronald
Dobert stands in the
door of a mobile
lab that can detect
chemicals as far
away as two miles.



Tech Transfer on the Web

Inventor’s Digest Online

www.inventorsdigest.com

Designed for anyone who’s said “I’ve got a great idea....now what do I do?” and as a resource for anyone searching for the next hot product, this site offers advice and help for inventors, updates on federal patent legislation, invention-related news, links to trade shows, networking opportunities for inventors, and information on the sponsoring magazine, *Inventor’s Digest*.



New Tech Transfer Web Portal

www.uventures.com

The **National Institutes of Health (NIH)** has partnered with this new tech transfer web portal to help create the world’s largest database of available licensing technology. **U Ventures** offers a free database that quickly locates more than 3,500 technologies available for licensing—ranging from high-tech information to new chemical processes, health care and food processing systems, and agricultural materials.

Cold Regions Science and Technology

icweb.loc.gov/rr/scitech/coldregions/welcome.html

Since 1951, the **Library of Congress** has prepared the *Bibliography on Cold Regions Science and Technology* under the **U.S. Army Cold Regions Research and Engineering Lab’s (CRREL)** sponsorship. The bibliography (available at the above site) covers publications in the fields of civil, oceanic, and atmospheric sciences. The 168,000+ items include journal articles, monographs, technical reports, and patents from private, academic, and government sources.

Science Week Online

www.scienceweek.com

Science Week—a journal devoted to improving communication between scientific disciplines and among scientists, educators, and policymakers—recently updated its site’s free access search engine to include concordance line extracts and expanded archives, which now include focus reports and weekly reports from the site’s main page.



FED LABS FLASH

Technology transfer news, notes, and events within the federal lab community

Initiative Seeks to Squash Hackers

On February 7, web surfers hoping to use the popular web portal Yahoo got a rude surprise: the site was shut down by hackers—and stayed offline for three hours. During the next three days, seven of the Internet's top sites fell prey to "denial of service" attacks. Ironically, the cyberterrorist activities began the same day President Clinton submitted his proposed FY2001 federal budget to Congress. Within that budget is a \$60 million initiative for the **National Institute of Standards and Technology (NIST)** to protect the nation's critical information infrastructure by:

- ◆ establishing an institute to provide R&D grants to protect critical infrastructures from attack or other failures (\$50 million)
- ◆ developing new measurements, standards, test methods, and guidelines to better protect IT elements (\$5 million)
- ◆ creating a team of computer security experts to help federal agencies identify and fix vulnerabilities in information systems and prepare for future IT security threats (\$5 million).

For more info: Michael E. Newman, 301-975-3025, michael.newman@nist.gov

New System Benefits Small Oil and Gas Producers

The DOE's **Rocky Mountain Oilfield Testing Center (RMOTC)** has signed a research agreement with the **Petroleum Asset Management Company** to test a computer-operated artificial lift system that senses the presence of oil in a borehole. The system could reduce field operating costs, improve production, and simultaneously operate and record data from multiple wells. The objective is to validate and demonstrate that the artificial lift system has the potential to benefit small oil and gas producers through increased production in shallow wells.

For more info: Neil Haugland, 888-599-2200, neil.haugland@rmotc.doe.gov

Propulsion Center Is New Oak Ridge User Facility

The **Advanced Propulsion Technology Center** at the DOE's **Oak Ridge National Lab** has been designated a DOE national user facility. Specializing in detailed characterization of internal combustion engine emissions and efficiency, the facility's capabilities include tabletop engine exhaust simulators, single and multicylinder engines, and full vehicles. The center boasts several rare diagnostic and measurement tools to help develop and evaluate engine and emissions control technology. Current projects include determining the effects of fuel sulfur on diesel emissions controls, ignition phenomena, diesel and gasoline engine particle emissions, and catalyst surface diagnostics.

For more info: 865-576-4221; www-aptc.ornl.gov

Sandia, Ford to Pursue Technology R&D

The DOE's **Sandia National Labs** and **Ford Motor Company** have agreed to conduct cooperative technology R&D across a broad variety of areas. The five-year, \$5 million agreement has Sandia and Ford sharing funding. Technical categories for projects include: manufacturing equipment development, characterization, and automation; modeling and simulation; comprising code development and application; process and device modeling and simulation; environmentally conscious manufacturing technologies; and materials development and characterization. The first projects involve evaluating a cold spray deposition (CSD) process for powertrain components, engine bores, and tooling applications.

For more info: Clint Atwood, 505-844-0816, datwoo@sandia.gov; www.sandia.gov/media/NewsRel/NR2000/Ford1.htm

Dynamic High-Speed Test Facilities

The **Crew Systems Department** at the **U.S. Naval Aviation Systems Team** (Patuxent River, MD) has two testing facilities—a horizontal accelerator (HA) and an ejection tower (ET)—available for the test and evaluation of equipment modifications and new products. A pneumatically driven, hydraulically controlled linear actuator with a 100-foot test rail and control center that can simulate the forces, displacements, and accelerations of an actual crash, the HA offers a 64-channel data acquisition system, 50g acceleration, and four digital imagers that can view tests at all critical angles. Both facilities have been used by government agencies and the auto industry for R&D and crashworthiness evaluation. Currently, infant and child auto restraints are being tested for the **National Highway Traffic Safety Administration**, which certified the facilities as being compliant with Federal Motor Vehicle Safety Standard 213. The facilities can be used to test restraint systems, safety systems and equipment, inertia reels, air bags, energy-absorbing seats, and child safety seats.

For more info: George Gillespie, 301-342-2435, gillespieg@navair.navy.mil

NASA Incubator Launched

In late 1999, the **Big Sky Economic Development Authority (Big Sky EDA)** (Billings, MT) launched the **Montana Incubator for NASA Technology (MINT)**, which will foster the start-up of technology-based businesses via the commercialization of NASA and related technologies. An "incubator without walls," MINT is teamed with the **NASA-Montana State University TechLink Center** and will leverage Big Sky EDA's business assistance services. **NL**

For more info: James Ouldhouse, 406-256-6871, ouldhouse@bigskyeda.org



SPOTLIGHT ON SUCCESS

Success stories from the federal lab community

Assistive Technology and Law Enforcement Successes

Eyegaze: An Assistive Technology Success Story

Technology transfer can embody a multitude of specific scenarios—and the timelines and specifics of each vary widely. The following success story illustrates how patience, timing, and teamwork play important roles in successful technology transfer.

Air Force Beginnings

In the case of automatic (or video) eyetracking, the technology transfer process began in the 1960s when a DOD lab at **Wright-Patterson Air Force Base** sponsored a research project involving an automated procedure for observing the eye with a camera, measuring the locations of the pupil center and corneal reflection, and calculating the direction of gaze. In the early 1970s, another Air Force-sponsored project resulted in an “Oculometer,” which uses a video camera to observe a subject’s eye and a computer to process the camera’s image of the eye.

Both of these Air Force projects become important research components when **LC Technologies** began working on an eyetracking project in 1986 at the **University of Virginia**. As LC Technologies became more familiar with eyetracking technology and its potential applications, the company decided to concentrate all of its resources on developing an improved eyetracking device. The first application pursued was using the technology as a control and communication tool for people with severe physical disabilities. The result was the **Eyegaze System**, which hit the market in late 1988. To date, about 200 of these devices are in use worldwide.

Multiple Uses and Sources of Support

Throughout the technology transfer process, LC Technologies received support from the Small Business Innovation Research (SBIR) program, which included contracts with the Navy, the **National Institutes of Health**, and the **Department of Transportation**. LC also received R&D support from **NASA’s Jet Propulsion Laboratory**.

Eyetracking is a good example of a technology with multiple uses. In addition to its use as human-computer interface devices, eyetracking has considerable potential in psychological research (such as fatigue monitoring, task/scan analysis, situational awareness, usability analysis, and advertisement analysis) and physiological studies. These potential uses and their implementation depend on future improvements and enhancements in areas such as greater tolerance to head and body

movement, miniaturization and ruggedization, and higher resolution cameras and image processing.

For more info: Joe Lahoud, 800-393-4293, jlahoud@lctinc.com

VISAR: A Law Enforcement Success Story

VISAR (Video Image Registration and Stabilization) achieved initial praise for its unparalleled performance during the bombing investigation at the 1996 Olympics in Atlanta. Many home videotapes taken at the site just before and after the bombing needed enhancing to reveal potential clues. When existing methods fell short, law enforcement officials sought help from U.S. federal labs and, ultimately, **NASA**. At NASA, this challenging task was assigned to researchers **David Hathaway** and **Paul Meyer**—experts in global and solar image processing. VISAR was the result—and it has been in demand by the law enforcement, military, surveillance, and medical industries ever since.

To help meet this demand, **NASA Marshall Space Flight Center (MSFC)** teamed with one of NASA’s technology commercialization partners, **Research Triangle Institute (RTI)**, to commercialize VISAR in both the hardware and software fields. License agreements are currently being drawn up so VISAR can be incorporated into electronic hardware for digital camcorders and other real-time devices. NASA and RTI are also marketing the method to software producers, which will result in software that can enhance video taken by police car cameras and home camcorders.

In real-time applications, VISAR hardware has the potential to become a standard among video methods, similar to Dolby in the audio world. In addition to digital camcorders, hardware developers plan to place VISAR into real-time applications such as military targeting and moving medical imaging. However, VISAR’s largest market is expected to be software for post-processing video taken by home users and law enforcement personnel. VISAR now exists as a Windows-based program that can perform image registration and enhancement in the presence of both camera zoom and rotation effects—even when the background and foreground move at different rates.

Thanks to the unique NASA-RTI partnership, VISAR stands on the verge of revolutionizing the image processing industry—enabling VISAR to be embodied in chips inside of camcorders as well as in software to be used by homeowners and police officers. **NL**

For more info: Jody Page, 919-541-6528, jody@rti.org; Sammy Nabors, 256-544-5226, sammy.nabors@msfc.nasa.gov

For more success stories, visit the FLC web site at www.federallabs.org



COMING ATTRACTIONS

June 7-10, 2000

Technologies for Public Safety in Critical Incident Response

Denver, CO

Presented by the National Institute of Justice's Office of Science and Technology, this conference brings together law enforcement, fire, EMS, and other first responders to exchange info, see the latest tools and technologies for incident response and management, and hear how technology is being used to respond to public safety threats.

www.nlectc.org/conf/NIJ2000.html

June 11-15, 2000

Technology Partnership for Emergency Management Workshop and Exhibition

Colorado Springs, CO

Sponsored by the Federal Emergency Management Agency, this workshop and exhibition provides emergency managers from local, state, and federal organizations with an opportunity to network, see product demos, and view the latest technological advances for improving preparedness, response, mitigation, and recovery.

www.nrel.gov/surviving_disaster

June 12-16, 2000

International Decommissioning Symposium 2000

Knoxville, TN

The U.S. Department of Energy and the International Atomic Energy Agency are sponsoring this forum to address issues related to the task of deactivating and decommissioning U.S. and international nuclear facilities and to the recycling and reindustrialization efforts associated with those processes.

www.ids2000.org

July 20-22, 2000

Sitting on the Hot Seat: Technology Transfer for the New Millennium

Austin, TX

Attend the 25th annual meeting of the Technology Transfer Society and join your tech transfer peers—technology managers from government, industry, and academia; new business developers/manufacturers; policymakers; researchers; and venture capitalists—in a fast-paced learning and networking environment.

Frank Penaranda, 301-593-6472, frankpen@erols.com

June 28-July 2, 2000

Rehabilitation Engineering and Assistive Technology Society of North America

Orlando, FL

This meeting is the premier assistive and rehabilitation technology conference in the U.S.—combining cutting-edge educational sessions with exhibits that feature all areas of assistive and rehabilitation technology, including augmentative communication, seating/mobility, computer access and use, technologies for special populations, and more. Visit the FLC at Booth 518!

www.resna.org/resna/resna2k/index.html

August 21-23, 2000

Energy 2000

Pittsburgh, PA

Sponsored by the DOE, GSA, and DOD, this "hands-on" educational event is dedicated to assisting the federal government and military energy managers learn about and be aware of the technological advances available to them from manufacturers, suppliers, and service providers in the energy efficiency industry. This is the only national event like this scheduled for 2000.

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Jennifer Beasley
 FLC Management Support Office
 950 North Kings Highway
 Suite 208
 Cherry Hill, NJ 08034
 Phone: 856-667-7727 Fax: 856-667-8009
 E-mail: jbeasley@utsmall.com
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950 North Kings Highway
 Suite 208
 Cherry Hill, NJ 08034

