

The WHISTLE

RADAR Flashlight could help police detect hiding suspects

Jane Sanders
 Research News and Publications

Police officers serving a warrant or searching for a suspect hiding inside a building could soon have a new tool for protecting themselves and finding the “bad guy.”

A prototype device called the RADAR Flashlight, developed at the Georgia Tech Research Institute (GTRI), can detect a human’s presence through doors and walls up to 8 inches thick. The device uses a narrow 16-degree radar beam and specialized signal processor to discern respiration and/or movement up to three meters behind a wall. The device can penetrate even heavy clothing to detect respiration and movements of as little as a few millimeters.

“We believe the RADAR Flashlight potentially will be useful to police officers in ambush situations,” says Gene Greneker, the GTRI principal research scientist who led the development of the device. “It is a force multiplier and a safety enhancement tool.”

The Flashlight is undergoing further modification and testing for the next six months. Georgia Tech has filed a provisional patent for the device, which could become commercially available to law enforcement officials within a couple of years if the university licenses the technology to a manufacturer.

With funding in 1998 from the National Institute of Justice (NIJ), a division of the U.S. Justice Department, Greneker and his team took the RADAR Flashlight from a bulky three-part prototype to a self-contained unit that weighs about seven pounds. The NIJ tested the device last year at the National Law Enforcement Corrections Technology Center in Charleston, S.C., and suggested further modifications. Work on those changes is expected to begin this spring with additional funding from the NIJ.

“We will be modifying the RADAR Flashlight based on what law enforcement officials told us from the tests,” Greneker says.

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Researcher Gene Greneker demonstrates the RADAR flashlight.

OIT extends dial-up access; phase-out expected by fall

Theresa Harvard Johnson
 Office of Information Technology

Recent concerns over the phase-out of public dial-in modems have prompted Georgia Tech’s Office of Information Technology (OIT) to re-articulate its vision for off-site Internet connectivity to the campus.

Currently, the Institute offers two methods of remote access to campus users — a small number of aging dial-up modems, and a contract vehicle for ISP services through CampusCWIX.

“The announced phase-out of the obsolete dial-in modems reflects the strategy established prior to the 1996 Olympic Games to direct campus remote access customers to commercial ISP services while eliminating campus dependence on the aging technology of dial-up modems over a period of time,” said Gordon Wishon, associate vice president

and associate vice provost of Information Technology.

He said that the current modem pool is obsolete and will not sustain current demands for high quality, high-speed access. The current modem pool has dwindled to approximately 100 and is being used by an ever-decreasing number of campus users.

“Our vision is to enable students, faculty and staff to avail themselves of the best possible connectivity that is available from whatever location they choose,” said John Mullin, executive director of the Office of Information Technology. “This varies widely by location and may include DSL, cable modems, or dial-up access through any commercial service. We firmly believe that this service will provide far more quality to the campus community than can ever be provided by a local dial-up modem pool.”

In appreciation of the fact that the phasing out of the modem

pools may cause difficulties to current users, OIT is deferring the elimination of these services for an additional 90 days — until the end of the summer semester.

OIT is poised to roll out a new suite of services to enhance and improve the options for remote access to the Georgia Tech network. The core principal is to support reliable, secure access via the Internet to authorized students, faculty and staff.

OIT is also pursuing a web mail front-end to its prism system, meaning e-mail can be accessed from any web browser.

“We plan to have this in production by the beginning of fall semester,” said Mullin. “For those needing Unix shell connectivity to campus — for example, prism login — we recommend SSH (secure shell). Windows clients (SecureCRT) are currently available from and supported by OIT.”

For those with other needs, OIT is rolling out a VPN solution,

which requires the installation of a Check Point secure remote client. The solution is currently in production for the Georgia Tech Regional Engineering Program, and being tested by other departments. The software installs on a user’s computer and makes an encrypted connection back to campus whenever users access a campus resource. Using this client, the user has access to campus services just as if they were physically located on campus.

“We expect the Windows version of this software to be available around May 1 and other clients (Mac, Linux, Solaris) shortly thereafter,” said Mullin. “We understand there are some users still making use of the OIT public dial-ins. OIT will maintain them until the end of Summer Semester 2001 to give users time to adapt to the changes.”



Photo by Sue Clites

The highlight of the College of Computing’s recent tenth anniversary celebration was a lecture on April 5 by former U.S. Attorney General Janet Reno, seen above trying on Professor Thad Starner’s personal wearable computer. Speaking at the first Thomas E. Noonan Distinguished Lecture on Information Security, Reno addressed the need to act in dealing with the serious threat of cybercrime and cyber terrorism through increased education and greater cooperation between government organizations, academia and other sectors.

“There is terrorism which I think about so often, but hope that we never see the results of in this country,” said Reno. Later, she would add, “We have been too lucky so far. Our luck will run out, and I would like to issue a call for action.”

Campus welcomes noted speakers

Euan Baird, chairman, president, and CEO of Schlumberger was this year’s Woodruff School of Mechanical Engineering’s Annual Distinguished lecturer. Schlumberger Ltd. has long credited much of its success to a multicultural workforce. Baird spoke to a packed house on April 10 about the importance of diversity in the workplace. Drawing upon his 40 years at Schlumberger, Baird shared elements of the company’s approach to creating a broader understanding of varied customer and cultural demands in the global market and the strategic advantages created by bringing diversity into an organization.



Photo by Gary Meek

Academic Senate and Academic Faculty to meet in Student Center Theater April 24

A meeting of the Academic Senate and the Academic Faculty will be held at 3:00 p.m. in the Student Center Theater. Agenda highlights include a discussion of grading policy, a report on evaluation of instruction and a presentation of the new computer network and usage policy. A detailed agenda may be found at <http://www.facultysenate.gatech.edu/asagen24april.html>.



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Barbara Wilson
Auxiliary Services

For the second year in a row, spring is welcomed on campus without the long lines common during parking registration in the past. Registration began on April 16, and by the end of the second official day of transactions more than 4,000 had entered their permit requests.

“It looks like it is running a bit ahead of last year,” said Peter Lange, Systems Support for the Parking and Transportation Department.

This change in parking services is due to the implementation of the T-2 Power Park program last year. Through the use of this program, the number of permits in the decks, as well as the parking availability in the various lots, can be tracked for maximum efficiency. Additionally, the system can track citations and other parking violations.

“Now we know the exact number of permits in the East and West decks,” said Parking Director Rod Weis. “It has completely changed the way we use the system.”

The project was developed as a collaborative effort between the Office of Parking and Transportation and a team from the Planning and Programming Division of the Office of Information Technology.

To register online, faculty and staff must log on to www.parking.gatech.edu, with social security numbers, tag number, building name, and parking lot choices. The site then involves a set of choices: carpool, reserved, and other specifications for each employee’s need. After acceptance, you are sent an automatic e-mail response from the system regarding your application. Applications received after the June cutoff date will be considered late and will result in those applicants losing priority for their employees.

Departments on campus that have large numbers of employees without access to the Internet may contact the Parking Department to schedule a time to register their staff individually. Managers may also register their employees.

For more information, contact Lange at 894-1484 or at info.parking@parking.gatech.edu to schedule a time.

Online registration changes — year two

- **Change of zone:** Current permit holders requesting a change of zone will have two choices with their third choice defaulting to their current lot. This will allow customers to get on wait lists for highly desirable lots without the chance of getting bumped.
- **Co-op students:** Co-op students who returned their permit in December and January will be allowed to renew their permit. They will maintain their priority as a permit owner, unlike last year when they were treated as a new request.
- **Faculty/Staff payment methods:** Faculty and staff electing to pay with credit card or check will register online and be billed when assignments are made. Specific deadlines for payment will be included in the confirmation email. Permits not paid by those deadlines will be placed back in inventory to be resold. Payment deadline is July 13.
- **Lot changes and closures:** The Remote Lot will be closed for construction of Technology Square. Permit holders will be given priority in P01. A19 will be closed for construction of the Student Health Center. Permit holders will be given priority in A06. The Aquatic Center Lot (R03) will be closed for construction of SAC II. Current permit holders will not be affected. This will result in a longer wait list. A10 will be combined with A15, with A10 permit holders given priority in A15.

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“For one thing, they said it makes too much noise when it locks onto a wall (to scan). Also, for use by SWAT teams, the RADAR Flashlight needs to be operated by remote control. So we plan to put the Flashlight on a tripod at least 25 feet away from a wall and steer it by remote control to the part of the wall we’re interested in scanning.”

When these modifications are complete, the Flashlight will undergo more rigorous testing in various environmental conditions.

In its current form, the Flashlight operates in the following manner: The user holds the device with a pistol-grip handle, pulls a trigger, and the device runs a three-second self-test to verify that it is properly functioning. The user sees the results as a bar graph on a small LED display built into the device. Then the user presses the device against a wall, pulls the trigger and within three seconds the system automatically spaces itself from the wall at a distance designed for best performance. The Flashlight’s narrow radar beam sends out a pulse of electromagnetic energy, then detects the return signal, which is read by high-speed signal processing technology that quickly delivers bar-graph results to the user’s display. As the person on the other side of the wall breathes, the bar-graph display rises and falls with a rhythmic response.

Research that evolved into the RADAR Flashlight began at GTRI in the mid-1980s with the patenting of a frequency-modulated radar for remotely checking vital signs of soldiers wounded on the battlefield before

risking medics’ lives to save the injured. This early technology also was tested for its ability to monitor vital signs of soldiers clothed in chemical or biological warfare suits, without requiring them to risk contamination by removing the protective gear.

Today, a technical challenge remains for researchers working on the Flashlight.

“We have one problem,” Greneker says. “This instrument is so sensitive to motion that



Above, the RADAR flashlight can detect motion, giving police clues as to the whereabouts of suspects.

if you don’t hold it still enough, it will detect its own self-motion. If we can overcome this, it would be the Holy Grail, and interestingly enough, we think we know how to solve this problem with additional research.”

Bill Deck of the National Law Enforcement Corrections Technology Center cited the Flashlight’s stability and LED display as key issues to target before the device is commercialized.

“The RADAR Flashlight has some

potential,” Deck said. “There is some interest from police departments. They gave us about 25 scenarios in which the device could be useful. For example, when an officer goes to serve a warrant, it could let him know that someone is standing behind the door, maybe waiting to ambush him.”

Greneker says he is encouraged by interest from police departments and hopes the Flashlight will be commercialized soon.

“Our target sales price is \$1,000 to \$1,500 per device,” Greneker says. “That price range is important to police departments because they usually don’t have a lot of money to spend.”

Meanwhile, other companies have developed a micro-impulse type radar intended for the same purposes as the RADAR Flashlight. The micro-impulse radar spreads energy over a broad band of frequencies using a technique not yet approved by the Federal Communications Commission, Greneker says.

The Flashlight operates on a narrow frequency in a license-free band, he adds. It can detect motion and/or respiration through brick, wood, plaster board, glass and concrete. It will not work in water or on metal structures,

such as mobile homes, because these materials are electrical conductors.

For those concerned about radiation exposure from the flashlight, Greneker says the emission is very small — meeting national standards for the maximum human exposure limits. It emits about the same amount of radiation as a person receives when standing in front of a microwave-actuated door in a store.

Faculty/staff fund close to goal; deadline approaching

Roll Call, Georgia Tech’s annual fund, is continuing to raise money up until the June 29 deadline.

Organized by the office of Alumni Affairs, the money raised is part of a general fund overseen by the Georgia Tech Foundation and dispersed according to immediate need, as determined by President Clough and the Foundation.

Culver Stapleton, assistant director of Annual Giving, recently noted that “The reality is, tuition only covers a portion of what it really costs [for students] to get a Georgia Tech education.”

“The annual fund,” she added, “helps to make up that difference.”

In its 54th year, Roll Call draws on a number of constituencies — alumni, parents and friends — for contributions. Their donations constitute the university’s largest source of unrestricted funds.

Faculty and staff, though, have the unique ability to allocate their contribution to any of 75 individual accounts within a school or other university department.

This year’s goals for the Faculty/Staff Fund are 485 donors raising \$290,000. Currently, the fund stands at 75 percent of its goal.

Despite the success of Tech’s recently completed Capital Campaign, it is important to note that that money is largely restricted — dedicated to building construction,

scholarships and faculty endowments.

Monies raised through the annual fund, on the other hand, go to pay for the more mundane, yet vital university operations.

“These are smaller gifts that add up to a large amount of money,” Stapleton said, citing that the annual fund helps defray these incidental costs. “They are equally as important to ensuring the vitality of Georgia Tech.”

For more information...

Call 894-0759 or visit <http://www.gtalumni.org> and follow the links under “Support Tech.”

Library & Information Center — Hours during exams

Friday, April 27	8 a.m. - 9 p.m.
Saturday, April 28	9 a.m. - 9 p.m.
Sunday, April 29	noon - midnight*
Monday, April 30	8 a.m. - midnight*
Tues.-Thurs., May 1-3	8 a.m. - midnight*

Friday, May 4	8 a.m. - 6 p.m.
Saturday, May 5	9 a.m. - 6 p.m.
Sunday, May 6	closed
Mon.-Fri., May 7-11	8 a.m. - 6 p.m.
Saturday, May 12	closed
Sunday, May 13	noon - 9 p.m.
Monday, May 14	resume regular hours

*study hall hours: midnight - 8 a.m.