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THE WHISTLE

FACULTY/STAFF NEWSPAPER

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THE GEORGIA INSTITUTE OF TECHNOLOGY

Governors visit Aware Home



photo by Andrew Niesen

Dirk Kempthorne (right), chair of the National Governors Association and governor of Idaho, and Governor Sonny Perdue visited the Aware Home this month to experience several hands-on demonstrations of the latest technologies designed to promote independent and healthy aging.

With the first wave of baby boomers reaching retirement age within the next seven years, greater focus is being placed on developing awareness technologies that can provide assistance to the aging population, enabling senior adults to stay in their own homes longer.

Associate Professor Gregory Abowd recently testified before both the U.S. Senate's Committee on Aging and the National Governors Association, increasing state and federal government awareness of the interdisciplinary research within the Aware Home Research Initiative and encouraging this recent visit.

For more information on the projects being developed, visit www.awarehome.gatech.edu.

Study points to payoffs from a college degree in Georgia

John Toon
Research News

A new study of higher education in Georgia highlights the value of college education to both individuals and to the state, and points out occupational specialties with the greatest future demand and potential financial rewards.

Conducted by researchers at Georgia Tech, the study shows that for recent graduates, a college degree from the University System of Georgia is worth an average of \$14,000 a year in additional earnings. Over the course of a working career, the average Georgia college graduate could expect to earn nearly one million dollars more than a high school-educated neighbor, the researchers found.

Overall, increased earnings of the 90,000 University System graduates analyzed in the study added \$1.25 billion to the state's economy during 1998 — the most recent year for which information was available. These University System graduates had widespread impact on the state, bringing at least one million dollars a year in additional economic impact to more than half of Georgia's 159 counties.

"The economic value of college graduates is so massive, so widespread and so long-lasting that we

tend to take it for granted," said Bill Drummond, a professor in the College of Architecture's City and Regional Planning Program and principal investigator for the study. "It is one of the huge, but hidden, drivers of Georgia's rapid economic growth."

The researchers studied University System students who graduated between 1993 and 1997. Commissioned by the University System's Intellectual Capital Partnership Program (ICAPP), the study relies on an analysis of U.S. Census Bureau data, combined with Georgia Department of Labor information.

"Georgia benefits from the University System in many ways, including the production of an educated labor force, the generation of new knowledge through research, the creation and expansion of businesses, and — perhaps most important in a democracy — the development of educated and responsible citizens," Drummond said. "But this study has shown that one factor alone, the direct economic impact of University System graduates, more than justifies Georgia's investment in higher education."

University System Chancellor Thomas C. Meredith said: "As our

Degree continued, page 2

To sniff out contraband, drug enforcement officials turn to science

Larry Bowie
Institute Communications
and Public Affairs

Police dogs across the country could soon be out of work, replaced by an electronic "dog-on-a-chip" that sniffs out cocaine and other narcotics. Scientists at Georgia Tech have created a new detection tool that is portable, inexpensive, and doesn't require feeding or grooming. They say it is superior to previous "electronic noses" designed for this purpose.

The report appears in the current edition of *Analytical Chemistry*, a peer-reviewed journal of the American Chemical Society.

"Our technology provides a hand-held sensing device capable of real-time detection, reducing the time between drug seizure and laboratory analysis," says Desmond Stubbs, a doctoral candidate in chemistry working under the direction of William Hunt, a professor in the School of Electrical and Computer Engineering. The sensor, which performed well in the lab and in a field test with the Georgia Bureau of Investigation, is "an elegant fusion of biotechnology and microelectronics," according to Hunt.

According to the Office of National Drug Policy, the U.S. government will spend more than \$19 billion this year in the war on drugs. With their highly

developed olfactory systems, police dogs are important tools in this battle, detecting molecules in the part-per-billion range.

But using dogs has its drawbacks. They require expensive handlers to train and care for them, and any seized drugs must still be sent to the lab for further analysis. Dogs also have trouble detecting specific drug targets in the presence of other odors, such as coffee grounds.

"Unfortunately, the illicit drug traffickers are aware of this and invariably mask their product with different chemicals to evade authorities," Stubbs says.

Nose continued, page 3

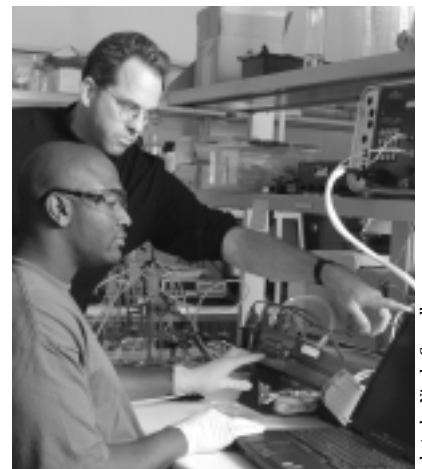


photo by Nicole Gappello

Desmond Stubbs (seated) and William Hunt.

"QUOTE - UNQUOTE"

"Our public buildings define us as a people. The last thing we want to do is hide behind barricades. At the same time, we live in a world of very real threats. So architects have had to draw on all of their wits and talents to design protections."
—Doug Allen, associate dean for academic affairs in the College of Architecture, on the landscaping and design of governmental and commercial buildings post-9/11. (Atlanta Business Chronicle)

"I think before you go to war, you've got to have exhausted all the diplomatic possibilities. He didn't. I think you have to have a realistic plan for what happens after you turn loose the bombers and send the armored columns in. He didn't."
—Retired Gen. Wesley Clark, who is running for the Democratic Presidential nomination, speaking at a Nov. 7 rally on the Georgia Tech campus. (Seattle Times)

In preparing students, professional ethics gets its due

Michael Hagearty
Institute Communications
and Public Affairs

At Georgia Tech, Robert Kirkman is something of an oddity. In a culture where the emphasis is on data calculations and absolutes, his background is decidedly less rigid, but not any less rigorous.

An assistant professor in the School of Public Policy, Kirkman holds a doctorate in philosophy. This week, he'll lead a seminar, sponsored by the Center for the Enhancement of Teaching and Learning, consisting of fellow junior faculty members seeking to integrate ethics into the classroom.

"Some ask 'What's ethics got to do with engineering?'" he says. Part of it involves helping students to recognize potential dilemmas and giving them the foundation to exercise good ethical judgment.

He cited the Space Shuttle Challenger explosion in 1986 as a case study. Managers who placed greater focus on meeting a deadline ignored engineers voicing safety

concerns. The catastrophe raised serious issues of ethics within NASA and among its contractors.

Until recently, most professional ethics courses were aimed at medical, law or business students. That perception is changing. Among peer review organizations such as the Accreditation Board for Engineering and Technology, there is a greater expectation for curricula to incorporate ethics and education.

"I take a broad view of ethics for engineers," said Kirkman. "It's not just compliance with professional codes of conduct. Going beyond that, engineering is a practice that has an impact on society in obvious ways. Getting students to think about that impact is useful because it gets them thinking about the consequences of things they design."

What Kirkman attempts to instill is that while solving complicated technical problems can be professionally and personally satisfying, being mindful of the social and political ramifications of their actions can help guide students through the terrain.

"Our goal is to help students develop the kind of judgment to deal

with these situations when they arise."

To do that, Kirkman envisions a dual approach, beginning with a course in ethical theory. As students progress in their education, continue to introduce ethics into the curriculum, he says, "in order to ensure they're transferring what they've learned into their professional lives."

Kirkman directs Philosophy, Science, and Technology, a minor and certificate program within Public Policy. Given the scant research on teaching ethics to engineers, he's also working on an initiative to raise its profile across the Institute.

"I'm interested in building a network of people interested in teaching ethics, creating a shared pool of resources and having a shared conversation about how to teach ethics at Tech," he says. "There's still a lot of work to be done to find the best way to do this."

For more information...

Assistant Professor Robert Kirkman
www.spp.gatech.edu/people/faculty/
rkirkman.htm

Degree, cont'd from page 1

funding partners struggle with grave budget issues, I would encourage them not to harm this generator of economic growth. Georgia so far has resisted the trend we see in many states to reduce substantially the state's investment in higher education. Our economy has benefited from that decision, and as this study has shown, those benefits will continue to increase in the decades to come."

The Georgia Tech study adapted analysis techniques used by the U.S. Census Bureau in its 2002 report, "The Big Payoff," which examined the benefits of college education on a national basis.

"Traditionally, the impact of the University System has been calculated on expenditure data," noted Jan Youtie, a researcher in the Economic Development Institute (EDI) and Drummond's collaborator on the study. "But universities are not in the business of spending money. They are in the business of educating people. So the methodology we used is uniquely appropriate to measure the value of education."

Youtie cautioned that comparing earnings of college graduates to persons with high-school diplomas can be problematic because of the difficulty in accounting for individual differences in energy, creativity and intelligence that affect earning potential.

The 34 units of the University System account for nearly half of all of Georgia's college graduates, the study found.

Areas of demand

In addition to measuring the value of a college education, the study also looked at the demand for specific college disciplines, anticipated shortages and the migration patterns related to occupational needs.

Projections from the Georgia Department of Labor (DOL) indicate that occupations related to higher education will make up 25 percent of all the state's jobs by 2010, an increase from 23 percent in 2000. The DOL study forecasts that the top three higher education-related occupations, based on numeric employment increases, will be registered nurses, computer support specialists and accountants and auditors. In terms of percentage increase, demand will grow the most for survey researchers, computer support specialists and physician's assistants.

The study found that significant shortfalls exist in just 12 specialties, among them elementary and kindergarten teachers, registered nurses, pharmacists, medical records and health information technicians and medical and clinical laboratory technicians. A shortfall in information technology graduates has been significantly reduced, largely through shrinkage of the industry, though scarcities continue in certain software engineering and systems occupations.

Data from this and other studies help the University System plan ahead for meeting the needs of Georgia companies. The full text of the study, "The Value of University System of Georgia Education," may be downloaded at www.icapp.org/publications.htm.



Assessing impact

Additional annual earning power attributed to a college degree ranged from \$5,706 for graduates of a two-year college up to \$19,362 for graduates of the Medical College of Georgia. Other institutions at the top of the ranking for helping graduates increase their annual earnings: Georgia Tech (\$18,621), Georgia State University (\$18,513), Southern Polytechnic State University (\$17,034), the State University of West Georgia (\$15,860) and the University of Georgia (\$14,682).

In total economic impact, Georgia State University led the state with \$217.8 million in total educational value for its 11,767 graduates, who had an average wage of \$42,465 in 1998. The University of Georgia's 14,383 graduates produced an educational value of \$211.1 million on an average wage of \$36,018.

Georgia Tech led University System units in the average annual wages of its recent graduates — \$46,535 — though the smaller number of graduates studied (5,472) contributed a smaller total educational value: \$101.9 million.

Georgia
Tech



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Georgia Tech is a unit of the
University System of Georgia.

By preserving the past, Coon Building renovation acclaimed

Sean Selman
Institute Communications
and Public Affairs

The \$9.1 million renovation of Georgia Tech's J.S. Coon Building — completed on time, under budget and ready for occupancy this fall — earns praise in the November 2003 issue of American School & University.

The trade publication follows trends in construction, design and planning of facilities at schools, junior colleges and universities throughout the United States. This month's issue honors the J.S. Coon Building renovation as one of 16 outstanding buildings in the Renovation/Modernization category of the 2003 American School & University Architectural Portfolio, compiled annually since 1983.

The renovation, designed by the Atlanta architecture firm of Jova Daniels Busby, transformed the early 20th century building on Cherry Street into a 21st century home for the students, faculty and staff of the School of Psychology. Plans call for the School's previous home to be razed, making room for the construction of the Klaus Advanced Computing Technology Building.

"We're very proud of the new facility, and I think everybody at Georgia Tech can be proud of it," said Randy Engle, chair of the School of Psychology.

The Coon Building was built in 1912 and was first called the New Shop building. It later was renamed in honor of John Sayler Coon (1854-1938), one of the Institute's original faculty members. "Uncle Si," as students knew him, was a professor of mechanical engineering who retired in 1922.

Between October 2001 and September 2003, his campus namesake was transformed through an interior demolition and renovation that included construction of an 11,000-square-foot addition



Maintaining architectural elements of the original exterior was a top priority.

and a 4,200-square-foot mezzanine. Architects and designers went to great lengths to maintain or incorporate some of the building's original architectural features into its new floor plans, Engle said.

"The Coon Building is one of the most historic buildings on campus, and since we have so few like it, keeping the historic qualities of the building was something we wanted to do from the beginning," he said.

Gary Petherick in the Office of Facilities was project manager for the Coon renovation, and he said he couldn't be more proud of the final result.

"I have been fortunate to have been involved with four other major renovations of historic buildings during my career at Tech, and I can tell you it is always a good feeling to see our older buildings brought back to life," Petherick said. "In my opinion, one of the things that makes [the Coon renovation] stand out is the way the interior was made new while allowing the character of the original building to be retained."

Nose, cont'd from page 1

The new device addresses all of these issues with two key features. This device has both the sensitivity to detect very small amounts of a chemical, and the specificity to differentiate a certain chemical from a group of many similar ones (see sidebar). It will also be significantly cheaper and less time-consuming by removing many of the steps from the current detection protocol.

The new device was carefully calibrated in a laboratory setting, and then it was put to the test in the field. "In field tests conducted at the Georgia Bureau of Investigation, we were able to detect cocaine obtained during an actual drug seizure," Stubbs says. "By simply drawing the vapor through our prototype device, we got a positive detection in a matter of seconds."

The ability to detect and identify small, non-volatile molecules such as cocaine based on their electronic vapor signature could also be used in airports and other locations to

detect explosives and chemical warfare agents, according to the researchers.

The U.S. Customs Service and the Office of National Drug Control Policy (ONDCP) provided funding for this research.

How it works:

The dog-on-a-chip can sense cocaine at a few trillionths of a gram. This sensitivity is achieved through surface acoustic wave (SAW) electronics, a method of detecting a chemical by measuring the disturbance it causes in sound waves across a quartz crystal. This is a fairly common analytical method and has been used in other types of electronic noses.

The new chip goes a step further by incorporating monoclonal antibodies — cloned copies of certain proteins the immune system produces to fight foreign invaders. The researchers used anti-benzoyllecgonine (anti-BZE) in the device because it differs only slightly in structure from cocaine, allowing it to bind preferentially to that molecule.

The SAW sensor is coated with a thin layer of anti-BZE. When a vapor sample passes through, cocaine molecules attach to anti-BZE molecules, causing a disturbance in the sound waves on the quartz crystal that is detected as an electrical signal.



IN BRIEF:

Call for nominees

Realizing the need for and importance of cultivating an environment where value is placed upon the broader concerns of all humanity, the Diversity Council is now accepting nominations for the Don Bratcher Human Relations Awards. The awards honor members of the campus community who are engaging in exemplary human relations work.

The award will grant one faculty/staff member \$3,000 and one undergraduate/graduate student \$1,500. Award recipients will be announced at the annual Faculty/Staff Honors Luncheon on April 7 and the Student Honors Luncheon on April 13.

To nominate a faculty or staff member, or a student, visit www.gtdiversity.gatech.edu to download award guidelines and a nomination form. All nominations must be submitted by Jan. 16, 2004. Call 894-7042 with additional questions.

\$3.7M grant for neuroengineering

Over the next five years, up to 40 Ph.D. students will be added to Georgia Tech and Emory University's joint biomedical engineering program using a \$3.7 million grant designed to prepare students for careers in the rapidly emerging biomedical field of neuroengineering.

The grant creates a new research and training program in which students will work under Tech's engineering faculty and Emory's medical researchers who share research space in the Laboratory for Neuroengineering at Georgia Tech.

The students will train in areas that integrate the fields of neuroscience and engineering, in which scientists apply engineering techniques to solve problems associated with the brain to ultimately help people afflicted with neurological disease and injury. The grant will help faculty prepare students for careers in academia or in the biomedical sector solving brain-related problems.

"We expect these students to emerge from the program as a new type of professional scientist-engineer who is equipped to incorporate the principles of living brain tissue into engineering devices for medical advancements," said Steve DeWeerth, a professor of electrical and computer engineering and director of the Laboratory for Neuroengineering.

The grant is funded by the National Science Foundation (NSF) under a program called IGERT, which stands for Integrative Graduate Education and Research Training. IGERT was developed to meet the challenges of educating Ph.D. scientists in multidisciplinary backgrounds and provide them with the technical, professional and personal skills needed for career demands of the future.

Remembering the neediest

The Office of Student Financial Planning and Services is an official collection site for the Toys for Tots Campaign for 2003. Toys can be donated from Dec. 1-9 during normal business hours. Toys should be new and unwrapped. The Office of Student Financial Planning and Services is located on the third floor of the Student Success Center. Call 894-1962 for more information.

C A M P U S E V E N T S

Arts & Culture

Dec. 5

The Ferst Center for the Arts welcomes the gospel-rooted music of The Blind Boys of Alabama for an 8 p.m. show. Faculty and staff receive a 10-percent discount. For tickets, call 894-9600 or visit www.ferstcenter.org.

Dec. 7

The Ferst Center for the Arts welcomes the Moscow Boys Choir for a 2 p.m. show featuring a program celebrating Christmas around the world. For tickets, call 894-9600 or visit www.ferstcenter.org.

Brown Bags/Conferences/Lectures

Nov. 20

The Internet and Public Policy Project sponsors a Patriot Act debate featuring former U.S. Rep. Bob Barr and U.S. Assistant Attorney Randy Chartash, with questions posed by members of the news media, at 7:30 p.m. in the Clary Theater.

Nov. 20

The Graphics, Visualization and Usability (GVU) Center hosts a brown bag featuring Associate Professor Irfan Essa on "Digital Video Special Effects: Research and Educational Endeavors," at noon in room 102, MiRC. For more information, call 894-4488.

Nov. 21

The ADAPTS Office will host a brown bag faculty forum on universal design of instruction, led by North Georgia College and State University Director of Disability Services Rodney Pennamon, at 11:30 a.m. in room 117, Student Services. For more information, e-mail denise.johnson@vpss.gatech.edu.

Dec. 3

The School of Psychology's Distinguished Lecture Series welcomes Henry Roediger III, professor and chair of the Department of Psychology at Washington University in St. Louis, on "Aging and False Memory: Exploring Mark Twain's Conjecture," at 3 p.m. in room 250, J.S. Coon Building.

Dec. 3

The Center for Assistive Technologies and Environmental Access hosts a lunchtime discussion on strategies and methods for creating accessible distance education. Lunch will be provided for registered attendees. To register, e-mail barbara.christopher@coa.gatech.edu.

Dec. 5

The Seminar in Science and Technology Studies welcomes Miriam Solomon, professor of philosophy at Temple University, on "The Social Epistemology of NIH Consensus Conferences," at 3 p.m. in the Clary Theater.

Faculty/Staff Development

Dec. 3

The Office of Sponsored Programs hosts a class on "Intellectual Property and Technology Transfer," from 2 - 4 p.m. in room 119, Centennial Research Building. To register, call 894-6944.

Miscellaneous

Dec. 2

The fall meeting of the Academic Senate combined with a called meeting of the General Faculty will be at 3 p.m. in the Student Center Theater. An agenda is posted at www.facultysenate.gatech.edu. For more information, e-mail said.abdelkhalik@me.gatech.edu.

Dec. 3-5

The Holiday Craft Fair will be held from 9:30 a.m. - 3:30 p.m. in the Student Center lobby.

Dec. 4

A Fidelity Investments counselor will be available for confidential financial consultations. To schedule an appointment, call 800-642-7131.

Dec. 8

All faculty and their spouses/guests are invited to the Georgia Tech Faculty Women's Club Holiday Wine and Cheese Party, from 5 - 7 p.m. in the Alumni Faculty House.

Due to the Thanksgiving break, the next issue of the Whistle will be published Monday, December 1.

C L A S S I F I E D S

AUTOMOBILES

1984 Toyota Corolla. Diesel, 49 mpg, 5-speed manual, 4-door, hatchback, 161K miles, major service at 140K. Very clean, good condition, \$1,150. Call 770-565-3242.

1987 Nissan Maxima. Maroon, automatic, 6-cylinder, 4-door, sunroof, recent brake job, good tires, new alternator. High mileage, very reliable. Perfect local transportation for students. \$1,000 OBO. E-mail mbauerme@bellsouth.net.

1990 Honda Accord XL. Auto, 4-door, 120K miles, gray blue color. Power accessories. New battery & alternator. \$2,300. Call 894-3663 or e-mail david.goldfarb@facilities.gatech.edu.

1990 Jaguar XJ Sovereign, 4-door, loaded, new a/c, engine excellent, needs transmission work, 125K miles, \$3,500. Call 894-6015 or e-mail david.arnold@icpa.gatech.edu.

1992 VW Jetta. Automatic, 116K miles. Excellent maintenance, \$1,550 OBO. Call 404-273-1132.

1994 Mitsubishi 3000GT. Green, 2-door, 127K miles, good condition. New clutch, 5-speed, front wheel drive, multi-CD. \$6,000. Call 894-2479 or e-mail Mt3000Gt@hotmail.com.

1995 Chrysler Concorde. Gray, all power, one owner, 95K miles, excellent condition, \$4,500. Call Bob at 770-613-0258.

1996 Toyota RAV4 2-door. Automatic, all options and dual sunroof. Outstanding condition, all records. Recent expensive service by Toyota. 65K miles. Ideal campus car. \$6,950. Contact jayant@mediaflow.org.

1997 Ford Explorer XLT. Silver w/gray leather, V6 4.0 SOHC automatic w/overdrive, all power, sunroof, 6-CD changer, keyless entry, running boards, all records, 95K miles, Asking \$8,500. Call 404-233-3668.

1997 Geo Metro LSi. Two-door, blue, auto, 67K miles, a/c, AM/FM, excellent condition. \$2,200. Call 894-0950 or e-mail ms239@mail.gatech.edu.

1998 Dodge Grand Caravan. 83K miles, 3.0L V-6, runs great. Both side doors, 7 seats, AM/FM/cassette, a/c, cruise, manual locks and windows. VG condition, \$6,000. Call 894-3272.

1999 Chevy Tahoe LT. Silver, 4-door, 4WD, dual exhaust, loaded, 83K miles, \$15,000. Call 894-6015 or e-mail david.arnold@icpa.gatech.edu.

1999 Toyota Avalon XLS. Leather interior, 78K miles, great condition, \$13,000. Call Dana, 894-6946.

2000 Volkswagen Beetle GLS. Metallic blue, excellent condition, loaded, 44K miles, \$11,000. E-mail dpallone03@comcast.net.

REAL ESTATE/ROOMMATES

Cross Creek townhouse for rent. 10 minutes from Tech. 2BR/2.5BA with enclosed patio. A gated community with golf, tennis and pools. \$1,200/month + utilities. Call 404-352-2171.

3BR/2BA duplex for rent in Smyrna. Vaulted ceilings, skylights, fireplace, fenced backyard, w/d connection, storage. \$925/month. Leave message at 678-596-2825.

Visiting professor seeks to rent furnished 1BR/studio apartment from Dec. 15 - March 15 in Midtown close to Piedmont Park. Call 734-709-6339 or e-mail ruch@umich.edu

SPORTS/FITNESS/RECREATION

Bowflex workout machine in good condition with all parts. Asking \$550 OBO. Will deliver if needed. Call 894-3012 or e-mail shirley.manchester@mse.gatech.edu.

MISCELLANEOUS

Labrador Retriever puppies. AKC registered. All males: 1 black, 2 chocolate, 6 yellow. Ready by Christmas, \$350. Call Stephen Kutas at 770-383-3464.

Georgia Tech sweater: Ladies' cardigan, perfect for game day. Football, basketball, and Tech Tower emblems. See www.geocities.com/geilfamily/sweater.html for pictures. \$20 OBO. Contact mark.geil@ap.gatech.edu.

Moving sale. Pictures available at <http://photos.yahoo.com/soegut>. E-mail sonia.gutkin@chbe.gatech.edu or call 894-8474.

In search of surprise birthday gift: two tickets for Georgia Tech football game against the Bulldogs (11/29/03). Call 520-241-3997 or e-mail pennerm@email.arizona.edu.

1995 Coachman Catalina 315. Fully self-contained (generator ready). Lots of living amenities. \$19,000. Tow vehicle available. Call Dana, 894-6946.

1968 Harley Davidson Ironhead. Black/chrome. Rigid, original "Invader 5" chrome mags, new tires, chrome controls, drag bars/pipes. 95 percent complete ground up build. \$6,500. Call Dave, 404-392-2040.

Ads will run for a maximum of three issues. The Whistle reserves the right to edit ads longer than 30 words.