Sensor research focuses on improving terrorist tracking

Scientists at RIT are designing a new kind of optical sensor to fly in unmanned air vehicles, or surveillance drones, tracking subjects on foot or traveling in vehicles identified as a threat.

"I think we all understand that our military has a paradigm shift," says John Kerekes, associate professor in RIT's Chester F. Carlson Center for Imaging Science. "We're no longer fighting tanks in the open desert; we're fighting terrorism in small groups." Kerekes won a $1 million Discovery Challenge Thrust Grant from the Air Force Office of Scientific Research to design efficient sensors using multiple imaging techniques to track an individual or a vehicle.

The sensor will collect only the data it needs. It will assess a situation and select the sensing mode (black-and-white imaging, hyperspectral or polarization) for the purpose. Developing two strands of information—one about the target, the other about the background environment—will be key to maintaining a connection and for processing through camouflage effects.

The sensor will collect a black-and-white image of a target, say a car, and will record the shape of the object. The third imagery mode, polarization, cuts through the haze and gives information about surface roughness. It provides details that distinguish between objects of similar color and shape. (This mode can lock onto the unique material properties of the blue car in question.)

A hyperspectral image will plot the object's color as it appears in multiple wavelengths, from the visible light to the near and short infrared parts of the spectrum beyond that the eye can see.

"These are all complementary pieces of information and the idea is that if the object you are tracking goes into an area where you lose one piece of information, the other information might help," Kerekes says. As the lead scientist on the project, Kerekes assembled a comprehensive team with RIT collaborators and other scientists to envision the system from start to finish, all the way from the design of the optical and microelectronic devices to the synthesizing algorithms that will process the imagery.

Zoran Ninkov, professor of imaging science at RIT, is working on the overall optical system. Ninkov is modifying one of his own astronomical optical sensors for this downsized-looking purpose. Alan Kassanov, associate director of RIT's Semiconductor and Microsystems Fabrication Laboratory, is designing tunable microelectronic devices to collect specific wavelengths. Ohio-based Numerica Inc., a large subcontractor on the project, is creating the advanced algorithms necessary for tracking a target and picking the right imaging mode based on the scenario.

"The idea is to lead to more efficient sensing both from the point of view of the sensors as well as in the processing ability to adapt to these different modalities based on the conditions in the scene or the task at hand," says Kerekes.

"This is a sort of a roadblock," says James Myers, committee chairperson. "The survey goals are to collect information on how people feel about the work climate at RIT."

The previous study focused on diversity—in fact, it was referred to as a diversity survey," says James Myers, chairperson of the Climate Study Steering Committee. "We view this study as a similar study, which attempts to assess the work environment for all members of the RIT community. We ask questions about the climate for certain under-represented groups but this is not the exclusive focus of the study."

The survey to be used for the study was developed by the Climate Study Steering Committee members. Over the last several weeks, review and input has been incorporated from Staff Council, Academic Senate, Institute Council and the Executive Diversity Council. Before distribution, the survey will be reviewed by the Institutional Review Board, the campus organization that oversees human subjects research.

The survey will be available for two weeks. Participants will be able to access the survey online using their RIT computer account.

"The survey goals are to collect perceptions of RIT faculty and staff on their beliefs about RIT practices and policies affecting underrepresented groups and their personal experiences of climate," Myers says.

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New study measures RIT ‘climate,’ working environment

RIT begins a self-study to better understand how individuals on campus perceive the learning and working atmosphere of the campus. The online survey will be available to faculty and staff in mid-March.

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Scholarship program recognizes power of faculty mentoring

Associate professor Jennifer Schineider has always considered herself an "unofficial" mentor for students in the safety technology department in the College of Applied Science and Technology. And as a result of her participation in the Ronald E. McNair Postbaccalaureate Achievement Program, she has taken her mentorship role to a new level.

RIT receives $220,000 annual U.S. Department of Education for the McNair scholars program to provide educational services to low-income, first-generation college students—specifically African American, Latino and Native American— who are pursuing doctoral studies. Its focus is on the development of personal and educational skills, including effective communication and academic skills necessary for success in doctoral programs—as well as conducting invaluable post-baccalaurate research.

The scholarship is named for Ronald McNair, a mission specialist astronaut who lost his life on the Space Shuttle Challenger in 1986. Under the mentorship and guidance of committed faculty, students participate in a paid research internship to develop their research, presentation and publication skills. Students can also attend professional conferences and present their research at national conferences, meet with scholars, receive academic counseling and visit graduate schools.

In addition, The RIT McNair Scholars Program, with an award of $120,000 from Xerox, held Feb. 13, addressed the important role of undergraduate research for students, their universities and the research community at large. Panelists discussed their personal research experience and work with undergraduates and the importance of increasing undergraduate research opportunities at RIT.

"Challenge and support are the fundamental ingredients in the McNair Graduate Opportunity Program's educational philosophy," says Esiee Sierra-Torres, program director. "A student is most likely to grow academically and personally when he or she is both challenged and supported. The program structure attempts to foster these fundamental ingredients and thus facilitates skill development and motivation through academic research and mentoring."

"For a number of reasons, underrepresented minorities have not been provided with sufficient opportunities to explore academic disciplines that will help lead them to graduate studies," adds Sierra-Torres. "This lack of experience can and often does result in poor acclimation to the nature and process of research. Further, in the absence of hands-on approach to scientific investigation, underrepresented students do not acquire the basic research skills and laboratory preparation that is required for advanced studies. To overcome these obstacles, effective mentoring practices need to be established."

Kwesi Amable, a third-year medical informatics and bioinformatics dual major in the B. Thomas Golisano College of Computing and Information Sciences, is one of 26 McNair Scholars from across all RIT disciplines that found studying with a faculty mentor like Schneider and conducting research to be an unforgettable experience. Schneider, who has been involved with the program since its inception, enjoyed working along with Amable, who is a McNair Scholar and works closely with Schneider, as faculty mentor, as one component of the program.

Xerox Corp. awards tuition assistance to four RIT engineering students

Four RIT students are the recipients of a Multidisciplinary Senior Design Reviews. The ATV team was one of 36 design teams presenting completed and mid-project evaluations at the Kate Gleason College of Engineering Multidisciplinary Senior Design Reviews. Shifting into high gear

Students in the B. Thomas Golisano College of Computing and Information Sciences have a unique opportunity to partner with the federal government. The college’s Department of Networking, Security and Systems Administration has secured a grant from the National Security Agency, on behalf of the U.S. Department of Defense, to fund a scholarship program aimed at students studying a discipline related to computer and network security.

"The purpose is to increase the number of students who are entering the field of security and information assurance and to meet the Department of Defense's need for expertise in the areas of information technology for war fighting and security of its information infrastructure," says Sharon Mason, the principal investigator of the grant and a networking, security and systems administration professor.

The scholarship covers the full tuition of both undergraduate and graduate students. Undergraduate winners receive a $12,000 stipend and graduate recipients receive a $17,000 stipend. In exchange, recipients agree to work for the Department of Defense for one calendar year for each year they receive the scholarship. Many winners also participate in internships with the Department of Defense during the time they receive the scholarship.

"The students who apply for the scholarship are really excited by the idea of working with the government on this initiative of national defense," Mason says. "This is the second time the department received the grant."

Grant will help students in computing disciplines

In case you missed it in News & Events Daily:

**The Tiger Beat Blog: Good news of great grade**

**RIT YouTube channel: Tigers’ Winning Attitude**

**RIT in the News: Daily Messenger — Banjo Balls in the presidential chair**

Jennifer Wolley, adjunct professor of English and criminal justice, has dedicated her professional life to increasing understanding and assisting people involved with one of America’s most prevalent, if little talked about, social problems—prostitution. As the longtime director of Rochester’s Mary Magdalen Outreach Center, she works to assist prostitutes in getting off the streets and rebuilding their lives, while also enhancing public awareness concerning the social issues of the effect.

Through two courses offered at RIT, Wolley is working to increase the educational understanding of prostitution and crime, in general, and assist future professionals in better addressing the problem.

Prostitution and Vice, being offered through the Department of Criminal Justice, and the Literature of Crime, through the English department, both seek to help students reflect on the root causes of prostitution and crime, as well as engage discussion about contemporary solutions.

"The National Task Force on Prostitution has estimated that more than one million people, and 1 percent of American women, have worked as prostitutes," notes Wolley. "Given these statistics, more attention needs to be focused on why people take up this profession, how to get people off the streets and prevent others from starting."

These courses will hopefully give our students a background in the problem that will assist them in making better decisions related to the subject in their professional careers," she continues.

Prostitution and Vice provides a background on the development of the illegal sex industry in America and current social, criminal and political policies related to the issue. Wolley also brought in vice cops and former prostitutes to discuss the subject with her class.

The Literature of Crime includes writings on a host of topics related to criminal behavior and government responses including prostitution on serial killers, sex crimes and white-collar crime.

Wolley hopes through these efforts her students will not only understand the problem better but also develop more sympathy for the people involved in the sex industry, a key she feels is combatting the problem.

A large majority of prostitutes do not want to be doing what they are doing and efforts to address prostitution should be focused on treatment and assistance as opposed to incarceration," Wolley adds. "These courses seek to put a human face to the problem and enhance awareness of this critical component of the issue."

Grant recipients will assist people enrolled in the programs at the bachelor’s degree level or above who show financial need. Winners receive $7,000 tuition costs for the 2009-2010 school year. (Paul Stella | stellap@rit.edu)

New liberal arts courses bring societal issues to the forefront

In this issue you missed it in News & Events Daily:

**RIT News YouTube channel: Tigers’ Winning Attitude**

**RIT in the News: Daily Messenger — Banjo Balls in the presidential chair**

**Democracy and Chronic — Powerhouse RIT women’s hockey club concludes season**

**Bush-Holley Post — RIT student housing gets green lighting**

For these stories and more, visit www.rit.edu/news-daily.
RIT astrophysicist ‘moonlight’s as local jazz musician

Kastner and his band play the Lovin’ Cup March 8

Parthum earns patent for film processing to improve micro-devices strength

Michael Parthum has been awarded a patent for film mitigation in thin films. A professor in the Department of Mechanical and Mechatronics Engineering, his work focuses on the growth and enhancement of thin film micro-devices in the electronics industry.

"This is important in the integrated circuit and MEMS field where deposition of physical vapor deposition processes—the processes to deposit and thin films, respectively. In the new process, several layers have the potential to improve performance of many common devices that use microprocessors such as chip phones, pressure sensors, radiation detectors, high security applications and microphones.

Three additional patents are pending related to this system development for Parthum. His research focus is thin films/composite materials, radiation detection, micro nano-technology and nucleation, the process of using high heat or low cooling rates to crystallize liquids for use in the microelectronics industry.

Richard Santana, associate professor of RIT’s Department of English, is exploring how religion and morality are expressed in popular culture and the impact this has on the development of religious themes in American life.

"The book is unique because it doesn’t just look at how religion influences culture or vice versa, it examines the ways in which popular mass culture creates religious expression often when it is least expected,” explains Santana. “We examine music as different as Madonna, John Coltrane and Iron Maiden to raise issues about interpretation, cultural value and religious identity.”

This is Santana’s second book, following Language and the Decline of Magic, released in 2006. His research interests vary broadly. He is most interested in how language influences and sometimes shapes perception. He says his next project will examine the development of science in the early modern and enlightenment period as related to the shifting function of language.

Grant will help researchers study retention, advancement of female STEM faculty

RIT has been selected as one of 11 schools to receive a Institutional Development and Recruitment (ADVANCE) grant through the National Science Foundation’s ADVANCE program. RIT was awarded the grant for the proposal “Establishing the Foundation for Future National Reform and Transformation @ RIT (EFFORT@ RIT).” The proposal was developed by a cross functional team of faculty and staff who have embarked on a two-year study across five RIT colleges.

The grants support institutional self-assessment activities focused on the recruitment, retention and promotion of female faculty in science, technology and mathematics, and in STEM fields within higher education.

"The goal of the research is to identify barriers for our current women STEM faculty in regards to rank, tenure and leadership role progression,” says Margaret Bailey.

Grant will help researchers study retention, advancement of female STEM faculty

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mom said, "Oh, so you bought a book. Is it good?" "Yes, it is." And that's it." Sanchez's long-term goal is to be a laboratory director at a fertility clinic. She wants to help couples that have conceived children.

"My job would be to use technology to make it happen for them," Sanchez says. "You need a great support. But that does not happen."

Two other positions Sanchez has had as a career in fertility and reproductive health care.

"It's an odd and unceorific," Sanchez says. "While bioinformatics is a specific, hybrid major, it's also broad. Sanchez is finding her own way to a career in fertility and reproductive health care. She also wanted to leave Hawaii to experience the seasons. "I wanted to feel home and that something new is coming," she says.

During her five years at RIT, Sanchez said bioinformatics has created a complete computer system.

"I still don't know how to get where I want to go," Sanchez says. "All the time that is going to go and that's all that matters."

Keyser's work in the disciplines of painting and sculpture, and how it has evolved over the years. As Keyser explains, his modular operando has also changed. The flexibility of creating abstract paintings and free-standing sculptures is what drives him to work in solitary bliss for 6 to 10 hour intervals at his studio—a 2,000 square foot building behind his residence in Victor.

"I'm not the one that is going to put it all together with the materials," Keyser says. "I'm taking a few extra turns here and there, but I'm having fun along the way. I'll figure it out."

Sustainable Governance

Student Government is pleased to announce that it will be awarding three academic scholarships. Criteria for these scholarships will be based on innovative and creative solutions to problem solving, as the applications consist of two letters of recommendation from an RIT faculty or staff member, a resume, essay response, and an academic profile. A $1,000 cash prize will be presented to the winner with the most original ideas. Submission deadline is March 20. A dinner honoring the winners will be held in April. Scholarship applications are available at www.rit.edu/koos. The applications can be submitted to the Student Government Office, Room 212, STAND, 1560 Main Street, Rochester, 14623. Scholarship recipients will be announced May 1.

Another 'FIRST' for RIT robotics competitors

The Finger Lakes Regional FIRST Robotics competition is celebrating its fifth anniversary at RIT. The competition will be held March 7-8 in the Gordon Field House and Activities Center. RIT currently has 16 FIRST Robotics Scholarships awarded at the university.

A new cash prize will be presented to the winner of the FIRST Robotics competition. The cash prize will be presented to the winner of the FIRST Robotics competition.

Climate within the RIT work environment,


The book's purpose is to teach students how to examine the performance outcomes of the use of extended testing time at the post-secondary level.

Skip Battaglia, professor of film and animation, was honored with retrospecve screenings of 10 of his internationally acclaimed short films at the Ottawa International Animation Festival in Ottawa, Canada. Battaglia's films were produced from 1980 to 2008.

Jeffrey Baker, associate professor of psychology, presented his research titled "An Analysis of Changes in Poverty in India" in October at the Development Economics Seminar series at Cornell University. She also spoke in time in India where she presented "Measuring the Impact of Growth and Income Distribution on Poverty" as part of the Institute of Economics: Growth and Indusiaal Statistical Institute in Delhi, as well as the Global Institute of Economics and Politics.

Joni Dowling-Kell, director, Department of Account Services, is author and illustrator of Friends Forever, a picture book that helps children help others with the loss of a pet.

Gail Gilbert, English Grad student, had her essay "Conversion: Trial of a resident alien" selected for inclusion in the anthology Women and Risk Taking. The book was selected for the 2008 Amelia Bloomer List of America's best feminist writing, sponsored by the American Library Association. It also was named to the Best of the Best of Women's Writing.

Larry LaMagna, associate professor of liberal studies at NTID, and advisor for RIT's Lambda Alpha Upsilon fraternity, was recognized by the fraternity's national organization with the Seven Metas Award. The fraternity was founded in 1985 as a means to provide a social and cultural outlet for students of Latin American heritage. There are 10 national chapters now, including the one at RIT, which has had four chapters.


McNair isn't even enrolled in Schneider's department.

"It's important to reach across curricular lines when it comes to research because it helps bring new perspective to your project," Schneider says. "It's also central to why so many of us came to RIT as professors to begin with."