



Northeastern University

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## Featured Article

**Global studies program to expand to India**



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### New micro-lens to improve electronic devices

Northeastern physics researchers have created a new micro-lens that focuses infrared light at telecommunication frequencies — potentially leading to innovations in personal electronic devices.



Distinguished Professor Srinivas Sridhar, chair of physics, and his team at the university's Electronic Materials Research Institute say their micro-lens has the shortest focal length ever achieved, focusing an infrared beam to a spot just 12 micrometers away from the surface.

### CCIS takes interdisciplinary academic approach

The curriculum is a direct response to industry's demand for professionals with high-technology work skills capable of communicating in an increasingly more complex global environment.



Corporations such as IBM, Microsoft and Google succeed as a result of their ability to produce in a global context, said Larry Finkelstein, dean of CCIS. Therefore, to meet industry demands for diverse professionals in areas such as information technology, health care and business, programs in CCIS provide students with collaborative skills, the ability to understand not only their own disciplines, but the culture of fields outside their area of expertise and the maturity needed for future learning and achievement.

### In the media

- The Boston Phoenix [quoted](#) Stephen Burgard, director of journalism school, in an article about the large number of students who graduated or are looking to graduate with a bachelor's degree in journalism.
- Paul Harrington, associate director of the Center of Labor Market Studies, was [quoted in the Washington Post](#) about the underemployment of college graduates.

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### Global studies program to expand to India

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Denis Sullivan

The Global PACT India Dialogue is the result of a new partnership between the university and the Deshpande Foundation, one of the leading philanthropic foundations in Massachusetts and India in the areas of innovation, entrepreneurship and international development.

This partnership responds to a growing interest among students seeking non-traditional international career paths and the university's interest in forging and maintaining links with India. The novel program is made possible through the efforts of the Deshpande Foundation's Social Entrepreneurship Sand Box in India.

"Northeastern University's 'global vision' asks faculty and students to be fully engaged with the world community, an engagement that gives their efforts meaning, and has a positive impact on the communities with which they engage," said political science professor Denis Sullivan, director of the international affairs program. "We can do this by calling upon the knowledge, passion, and energies of students and faculty alike as positive forces for change in our local community and global society.

Global PACT India will be led by Denise Horn, assistant professor of international affairs, and by Lori Gardinier, director of the human services Program. The Deshpande Foundation will provide additional funding for the new program as well as logistical assistance.

In the spring, international affairs and human services majors involved in the new program will sign up for their normal four-class course load.

Students will first take two intensive courses on campus in January and February. They will then travel to Hubli in March, and remain there for up to two months. In India, they will take two more courses to round out their four-course load. The third course is a three-week intensive training program led by Global PACT trainers

and supervised by Horn.

Upon successful completion of this training, students will take a fourth course, which involves an internship with local Non-Governmental Organizations (NGO), supervised by Gardinier. Students will stay in Hubli until the end of the semester with the option to remain in co-op or intern positions. The four courses include:

- **International Human Services:** In this intensive course students will explore structural and organizational responses to human rights and community need. Using a comparative approach, students will identify how culture influences organizational design and service delivery. This course will also examine how organizations develop coordinated community responses in collaboration with government entities and other organizations. Students will be placed in service-learning sites in Boston working with recently-immigrated populations.
- **Transnational Activism and Global Civil Society:** This course examines transnational advocacy and activism from theoretical and practical perspectives. Students will explore the growing literature of transnational activism with a focus on the impact of such movements upon global and local civil society and issues of democratization and development. Students will research local and global problems and organize a community development project over the course of the semester to address these issues.
- **Global PACT India:** Students will work with their Indian peers at a local NGO to create community development programs around the theme of poverty, development, and technology. Over three weeks of intensive training with experts in the field, students will learn the key skills of community development work, including action research, leadership skills, organizational development, and cross-cultural communication.
- **Internship:** Students will stay on through the remainder of the spring 2009 semester to work as interns in local NGOs.

Global PACT India Dialogue is the first of Northeastern University's semester-long Global PACT and Dialogue of Civilizations programs. Northeastern has also formed a partnership with Casa de las Américas, a prestigious academy of the arts and literature in Cuba. The university will send as many as 20 students to the country beginning in January to study its rich cultural uniqueness and become acquainted with its history.

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### **New micro-lens to improve electronic devices**

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Srinivas Sridhar

The two-dimensional meta-material micro-lens, which uses the negative refractive index, was created by nano-engineering a photonic-crystal substrate into a multi-layered semiconducting wafer.

The micro-lens focuses infrared light at the limit of diffraction laws. In addition, the location of the focused light image is very sharp with little blurring.

"In order to go to the next level and create more efficient electronics, such as digital cameras, we need to explore ways to make things smaller," said Sridhar. "This research shows that it is possible to create smaller, ultra-compact infrared optical components that can be integrated into existing semiconductor technologies while not sacrificing image quality."

In addition to Sridhar, researchers involved with this project include Bernard Didier F. Casse, Wentao Lu and Yongjiang Huang, all of Northeastern's physics department. The report of their work was published in the Aug. 7 edition of the journal "Applied Physics Letters."

This work was also supported by the Air Force Research Laboratories and the National Science Foundation.

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### CCIS takes interdisciplinary academic approach

By Jason Kornwitz

To better manage the individuals he works with, communicate more effectively and motivate his employees, Northeastern graduate student Ted Blizzard routinely draws on knowledge gained from his "Organizational Behavior, Workflow Design and Change Management" course in the College of Computer and Information Science's health informatics program.



Larry Finkelstein, dean of the College of Computer and Information Science

Blizzard, who is chief information officer at the Massachusetts Medical Society and the New England Journal of Medicine, works with publishers, editorial staff members, physicians and clinical professionals here and abroad, such as the Li Ka Shing Faculty at the University of Hong Kong Medical School of Medicine.

"To drive an overall process to success rather than failure, it helps to be less of a tactical manager and more a strategic planner," he said. "There needs to be a flexibility so when things do go wrong, it's OK. If we're directionally oriented, we can let things be as they are and be a little Buddhist about the implementation."

Blizzard's strategy illustrates the sort of approach the College of Computer and Information Science (CCIS) strives to teach. The curriculum is a direct response to industry's demand for professionals with high-technology work skills capable of communicating in an increasingly more complex global environment.

Corporations such as IBM, Microsoft and Google succeed as a result of their ability to produce in a global context, said Larry Finkelstein, dean of CCIS. Therefore, to meet industry demands for diverse professionals in areas such as information technology, health care and business, programs in CCIS provide students with collaborative skills, the ability to understand not only their own disciplines, but the culture of fields outside their area of expertise and the maturity needed for future learning and achievement.

"The challenge is providing an educational background to all students," Finkelstein said, "so when they are out in the workforce, they not only know the language and culture of other disciplines, but they know how to think about things from other points of view."

CCIS offers undergraduates a dual degree in computer science or information science and business or cognitive psychology; computer

science and either mathematics, physics or biology and computer science and either multimedia, music technology or digital art. In addition, students can earn a combined bachelor of science and master of science degree in computer science through a six-year program.

"Through CCIS' undergraduate dual-degree programs, students gain deep knowledge of two disciplines," Finkelstein said. "The programs offer students opportunities and the chance to explore. Why should students be forced to choose between X and Y when they will have more worldly value if they have knowledge of both X and Y?"

While information technology is a rapidly expanding industry, many technology professionals lack the business expertise to use IT effectively to enable complex business strategies across a globally distributed workforce.

"What students learn after college far exceeds what they learn in college," Finkelstein said, "so we have to provide students with the ability to work effectively and in the proper context. Although students get a solid grounding in the most commercially important current technologies, the principal focus is on general concepts that provide a platform for future learning."

While working a co-op job, students in CCIS' dual-degree program apply the concepts, as well as a myriad of soft skills learned in class to hone in on future goals, provide important services and communicate clearly and effectively with bosses and co-workers.

Sarah House, a senior computer science and cognitive psychology dual-major, is currently working a co-op job at Phase Forward, which makes clinical trial data management software for drug companies. House makes software interfaces easier to use, conducts usability studies and interviews with in-house software users, doctors and drug companies on the ease of use of software that tracks test subjects' responses to drugs before they hit the market.

Originally a computer science major, House realized after her first co-op position coding environmental software that she "cared much more about how people are going to use software than the software itself." Her focus on clinical psychology has helped her understand the drug industry, learn to evaluate interfaces and study individuals to conduct effective usability studies, she said.

Her areas of study have improved her verbal and written communication skills across disciplines as well. Studying psychology has "put me in tune to how others operate," she said.

"A lot of computer science people have trouble communicating in general," she said, adding that effective communication between a programmer and non-programmer is essential. "Programmers are so entrenched in what they're working on that they forget people outside their realm aren't going to understand some 30-keystroke approach to using a feature of an application.

So you have to talk to the person that's written the complicated feature and discuss a way to make it easier for others to access. You have to think, 'If you don't understand when I explain it this way, maybe you will when I explain it this other way.'"

Additionally, House spoke of the differences between writing for computer science and writing for psychology, highlighting the importance of persuading readers.

"In computer science, if a student can prove an algorithm, it speaks

for itself," House said. "But, in psychology, where topics are more subjective, writing needs to be more convincing."

Matthew Soleyn, a junior studying information science and business, provides desktop support for Highmount Capital, an investment and wealth management firm. He is currently in the process of migrating the company's server to Windows 2008 and the desktop to Windows Vista.

Soleyn also helps maintain a wide-area file system that provides employees in Highmount's Boston and New York offices with access to the same files regardless of their physical location.

He said the information science and business dual-major provides him with more insight into the role information plays in the success of a company.

"It is critical to business operations that technology continues to work, though certain pieces of business technology are more important than others," Soleyn said. "If employees are unable to access both a website and their email, their inability to get to email is more important to resolve because it is relied on for communication."

On the topic of communication, Soleyn spoke of the necessity of tailoring a message to a specific audience. He said a required advanced writing course he took emphasized the value of presenting the same topic in two separate fashions. In one instance, his writing targeted the general public's understanding, in another, a more technical audience.

IT graduate programs named in top 10 of schools to 'watch'

This month, CCIS was named as one of the top 10 innovative "IT Schools to Watch" by Computerworld magazine in recognition of the college's information technology graduate programs, including the master's in information assurance and master's in health informatics, as well as its master's in computer science.

"The development and design of the information assurance, health informatics, and computer science programs at Northeastern are the university's responses to the changing demands of the information technology world," said Agnes Chan, associate dean for Graduate Studies in CCIS. "Our programs are constantly evolving and answering society's IT needs in a timely manner. They are flexible and strong in providing both theoretical fundamentals and practical viewpoints."

The computer science program draws on the expertise and research activities of the faculty to provide students with knowledge of the field. Students are given the opportunity to work on cutting-edge research projects with faculty advisors, and their education is further enhanced through internships.

The information assurance major is an interdisciplinary program designed to combine the technical expertise of CCIS with the social and legal knowledge of the College of Criminal Justice. The program brings in students from different backgrounds, ranging from computer science, to law enforcement, to accounting. Courses on topics such as cyber law allow students to debate privacy and legal issues associated with information assurance while other courses are designed to prepare students to assess the risks of different security features implemented in an organization and to provide technical advice.

"One of the best ways to learn about information assurance is to learn through mistakes as well as through success stories," Chan said.

In addition, faculty members in the program are mostly practicing professionals who have brought their own experience into the classroom, providing case studies to students. And graduates of the program, Chan said, are uniquely trained in managing the security infrastructure of a large organization.

The most recent example of Northeastern's interdisciplinary approach is the development of the health informatics program, which combines the technical knowledge of CCIS with the expertise and practices of health professionals from the Bouvé College of Health Sciences. The program, which enrolled its first students in September 2007, will have more than 70 students this fall.

"Graduates of the program, trained in both technical and health care fields, will be prepared to help lead the efforts to improve care through the adoption of leading edge technology," said Dr. Stanley Hochberg, an assistant clinical professor and director of the graduate program in health informatics.

The program's interactive, group-oriented courses and projects provide a framework for information technology professionals to grasp the unique characteristics of the healthcare system and for healthcare professionals to understand information technology.

And, given the local and national shortage of professionals with this unique skill set, Hochberg said health informatics is well aligned with the staffing needs of health care organizations and that employers have begun inquiring about the program's current and future students.

"For health care technology to drive improvements in health care, it has to be constructed and implemented with sound understanding from the technical side and the processes and operations on the health care side," Hochberg said. "By bringing students from different disciplines together to share their perspectives and pool their expertise, they gain valuable insight from each other that is beyond what they can get from an instructor."

Blizzard praised the quality of the program's professors and emphasized the practicality of the curriculum in which students meet vendors and examine and evaluate industry software and clinical applications.

"The kind of professors that the program attracts and the quality of work the professors do in the field is unmatched as far as any curriculum I've had," said Blizzard, who studied management in the advanced studies program at MIT. "At Northeastern, professors are working in healthcare and teaching what they are actually working on in real life. You can't get this type of learning out of a book."

Much like Blizzard, Jim Bartolotta said his time in the health informatics program has helped broaden his view of the American health care system and improved his day-to-day communication skills.

Bartolotta analyzes electronic medical record software for outpatient clinics and doctor's offices for Partners HealthCare, a non-profit organization that provides patients a variety of health care services including physicians, community hospitals and community health centers.

Currently, he's working with the Dana Farber Cancer Institute, Massachusetts General Hospital Cancer Center and North Shore Medical Center to enhance how oncologists use medical record software to order outpatient prescriptions for oral chemotherapy. He said a fundamental difference exists between how an IT professional and a clinician think about a program's ability to, for example, store a patients' cancer diagnosis and calculate a patients' drug dosage based on weight and height.

Bartolotta, though, maintains a strategy for overcoming the different styles of thinking of the oncologists, infusion nurses, clinicians, medical assistants and software developers that he works with each day.

"Remain workflow oriented and avoid technical issues," he said. "Whether in face-to-face meetings or over email, it is important to know your audience and cater the conversation accordingly."

While much of his communication occurs over email, he cautioned to keep electronic exchanges "short and sweet" and said his interactions with clinicians often include screenshots detailing prototypes of what possible software implementations will look like as well as surveys on the screenshots that ask open-ended questions on clinicians' likes, dislikes and suggestions.

Bartolotta took almost two years researching various graduate programs, but found most were either too technically oriented or leaned too heavily toward business until he discovered Northeastern's health informatics program.

"It provides me with a perfect blend of technology, business and healthcare-specific courses," he said. "Even my Java programming class is taught within the context of healthcare."

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