POWERED BY BU

BUILDING SMARTER MACHINES PAGE 24

A growing movement at Boston University and beyond is bringing together the disciplines of biology, computer science, and engineering to make smarter machines.

From books that cast light on forgotten struggles (page 19), to supercomputers that change the world (page 52),

It all starts here.
FROM INTERNAL SEED FUNDING and aptly named Ignition Awards, to strategic collaborations between fields and unwavering support for traditional disciplines, Boston University has the tools to empower researchers as they rediscover the wisdom of the past and take on the serious, complex challenges facing society today.

From the start, BU has been defined by an entrepreneurial spirit and a commitment to equality and to engagement with the wider community. Today, these values are reflected in an institution that takes pride in innovation, outreach, and the generation of new knowledge to benefit others—whether here in Boston or around the world.

With thousands of faculty members working in hundreds of departments, centers, and institutes, BU has the breadth and depth of expertise needed to inspire the next generation of leaders in research and the professions.

What keeps this large, dynamic enterprise running smoothly and effectively are the reflective, resourceful people in BU’s labs, offices, and classrooms. Together, they are defined by serious scholarship, creative, out-of-the-box thinking, and boundless energy and excitement. That’s what it means to be powered by BU.

www.bu.edu/research
Welcome to the 2011 issue of Research at Boston University. This issue marks my fifth year as the vice president and associate provost for research at BU, and I continue to be impressed and inspired by the ingenuity of our research community and the breadth and depth of its endeavors. Within the pages of this magazine, you will find stories that feature a handful of the thousands of faculty, students, and staff who are carrying out groundbreaking and innovative research on topics that range from health care for traditionally underserved communities to ancestral Balinese music. Over the past five years, I have also been impressed by our research community’s intellectual rigor and focus as our scholars continuously strive to reach a deeper understanding of the world in which we live and provide real-life solutions to many of its increasingly complex challenges.

With the rapidly increasing connectivity of our world across virtually all sectors of modern life, every major higher education research institution must come to grips with its global identity. Not only do we need to succeed in a more competitive and complex environment, but the general focus of the educational system is shifting toward creating global citizens with a much greater understanding of and commitment to the world beyond their neighborhoods. Indeed, as few high-level jobs do not require some level of global involvement, we must ensure that our students—whether they are humanists, social scientists, scientists, or engineers—are equipped to navigate the cultural, social, economic, and political complexities of their work environment.

From its inception over 170 years ago, BU’s reach has extended beyond our own campus, and in 1975 BU established an international exchange program, one of the nation’s first. A recent survey lists over 250 activities led by our faculty from 70 departments and other academic units in 14 schools and colleges. Our global programs cover 80 countries and Antarctica, and involve up to 40 percent of the student body. In addition, the substantial increase of BU’s presence as a major research university over the past three to four decades has been attracting researchers from all over the world, with strong international reputations and global connections.

This issue of Research at Boston University highlights our engagement in research collaborations with other institutions around the world. We also share accounts of conversations about the role and influence of mass and social media on disaster response, mediated by a collaboration between faculty in BU’s College of Communication and journalists and aid workers from around the world. Stories of global innovation you will also encounter some of the existing research that is being done in examining the lessons of history’s cross-cultural interactions, from challenging assumptions about American and European art and culture between the world wars, to translating Persian poetry into the 21st century.

With the hope that you will enjoy meeting our outstanding faculty, researchers, and students and learning about their remarkable accomplishments and their impact on and dedication to society, the University, and one another. And as you read on, realize that BU’s ongoing evolution, our current intensity and sense of purpose, our aspirations and vitality are not adequately reflected by the accomplishments described in this magazine, but are expressed in nascent ideas, concepts yet to be invented, and discoveries that are inspiring and not yet in conscious form. Just as many of the projects featured here were not yet formulated when I first arrived at BU almost five years ago, the journeys that our faculty and students are embarking on today that test the limits of human imagination will bear fruit over the next months, years, and even decades. I hope you are as eager as I am to explore future issues of Research at Boston University, where we will undoubtedly encounter concepts and phenomena that we cannot even begin to imagine today, and discover worlds that we did not expect existed.

Andrei E. Ruckenstein
With the largest safety-net hospital in New England, and a long history of outreach and engagement, Boston University is truly an institution dedicated to serving the community, both in Boston and around the world. Now, as universal health care stands at the forefront of the national political discourse, researchers are using novel strategies to connect with patient populations that have been overlooked and underestimated in the past, including low-income mothers, individuals reentering society after life on the streets, black women with uncontrolled diabetes, and people with intellectual disabilities.

**Where the Heart Is**

**Finding a Place to Live**

Isn’t the end of the story on homelessness—for participants in Christine Helfrich’s life skills intervention study, it’s just the beginning. Helfrich, an assistant professor of occupational therapy in the College of Health & Rehabilitation Sciences: Sargent College, is working with residents at two agencies in Boston, HomeStart and the Pine Street Inn, to determine what skills they need to know, and how those skills are best acquired, in order to stay housed longer and to improve their quality of life.

“When you talk about homelessness, there’s the issue of finding housing and the issue of maintaining housing,” says Helfrich. “Someone who’s been on the streets for thirty years, you might put them into an apartment, but they still might not sleep in their bed. They might take all the blankets off and sleep in a corner of the room, because that’s what they’re used to.”

Helfrich first began developing a life skills intervention curriculum for formerly homeless populations in Chicago more than a decade ago. Now her curriculum has evolved into four modules, addressing Money Management; Food and Nutrition Management; Home and Self Care; and Safe Community Participation. Study participants can choose to complete one or all four modules, depending on their interests and needs. They are assessed regularly before, during, and after the intervention, which consists of six group classes and six optional individual sessions with an occupational therapist, to track their progress. The goal is to help participants transition out of survival mode and into a more functional form of daily living that incorporates activities that most people take for granted.

At the conclusion of the study, Helfrich will have data from a continuum of people who are on the streets, in...
It takes a certain amount of skill and cognitive ability and wherewithal, a lot of problem solving and strategizing, to survive on the streets.”

Helfrich and occupational therapist Andrea Halverson, who graduated from BU’s Sargent College last year, use group classes to foster social learning among study participants. “Andrea might come in and talk about food kitchens, or where you can get low-cost or free food,” says Helfrich, “but the people in the group really know a lot more than she does. Because of that, everybody has something to share, something they can teach people, and everybody is learning something new at the same time.”

Group classes work best, Helfrich says, when participants come from a range of backgrounds. All of those enrolled in the study, which is funded by the National Institute on Disability and Rehabilitation Research, have self-identified disabilities ranging from substance abuse, schizophrenia, depression, PTSD, and head injuries, to blindness, diabetes, and other physical impairments. But they bring very different work experiences and different reasons for becoming homeless.

“It’s not the stereotype of the high school dropout, or the drug addict on the street,” says Helfrich. “One of the things demographically that’s really surprising is the education level of participants. About 90 percent of people have at least a high school education, and 60 percent have a college education.” By comparison, approximately 87 percent of all Americans age 25 and older hold a high school diploma, 50 percent have some college experience, and 19 percent hold a bachelor’s or associate’s degree, according to the U.S. Census Bureau. Helfrich isn’t sure exactly why her study participants are so highly educated, though she suspects a process of self-selection—the intervention involves attending classes—plays a role. She also emphasizes the challenging nature of living without a home.

“It takes a certain amount of skill and cognitive ability and wherewithal, a lot of problem solving and strategizing to survive on the streets,” says Helfrich. “It’s not an easy thing to do. You hear people’s life stories and you think, could I have ever survived all that, and done that?”

That capacity for empathy guides what Helfrich calls a “very strong harm reduction approach to life skills.” The nutrition module, for instance, covers the USDA’s nutritional advice in a realistic way, by planning a balanced diet over the course of two weeks, rather than trying to incorporate protein, fiber, and dairy into meals each day. Participants also gain and share practical tips about “what you can eat more nutritiously at McDonald’s, how to know when food is spoiled and not spoiled, and which businesses will give away food at closing time.”

Helfrich is eager to help participants move to the next step in terms of stable, healthy, and housed living.

Virtual Worlds, Real Gains

IT’S CLEAR FROM THE START: that this isn’t your standard professional development fare. There’s a replica of the Colosseum, for one thing, as well as a dance floor, an underwater classroom, and chickens wandering freely through the grounds. Welcome to the private, pixelated island where John Wiecha, director of the medical education office and assistant dean of academic affairs at the School of Medicine, is testing the efficacy of virtual world platforms for delivering information to health care professionals and patients alike.

Wiecha successfully piloted a postgraduate medical education program in Second Life last year, with results published in the Journal of Medical Internet Research. The most well-established and stable online virtual world platform, Second Life has approximately 18 million users, a terrain comparable in size to the city of Houston, with the bonus of being free. Program participants were trained to use Second Life and given avatars, identities. They then logged in from seven states and Switzerland to attend a series of presentations on how to administer insulin in patients with diabetes, led by content expert Dr. Elliot Sternthal. By the end of the study participants’ knowledge of how much insulin to provide and when had increased, as had their confidence.

“A lot of primary care doctors are a little reluctant to use insulin in patients,” says Wiecha. “So we would have mock patients show up halfway through the program, and the doctors would interview them,” while a screen behind displayed blood sugar values and other relevant patient information. Program participants
enjoyed the chance to test their newly acquired skills on mock patients, and also praised the added sense of presence afforded by a representative avatar.

“It’s much different than participating in a webinar, where you can kind of check your email while you’re doing it. Here you really have to stay engaged,” says Wiecha, who is also an associate professor of family medicine.

Another advantage to Second Life is its capacity for constant engagement and feedback between an instructor and participants. A second project by Wiecha, Dr. Suzanne Mitchell, and Robin Heyden—an instructional design consultant who has played a key role in building the site, training users, and converting session content from experts into effective and compelling online presentations—capitalized on this potential by using Second Life to teach motivational interviewing skills to physicians.

“Motivational interviewing is about engaging you and finding out what your values are and what’s important to you, and why you’d want to change.”

“Motivational interviewing is a particular approach to communication around behavior change with patients,” says Wiecha. “Rather than the usual mode—a very top-down, paternalistic approach: ‘You should quit smoking, you should exercise more’—motivational interviewing is about engaging you and finding out what your values are and what’s important to you, and why you’d want to change. It’s much more effective than the usual method, but it’s a particular set of skills that need to be taught and practiced.”

His current project, with co-principal investigator Milagros C. Rosal of the Division of Preventive and Behavioral Medicine at the University of Massachusetts Medical School and funding from the National Institutes of Health, is also based on motivational interviewing techniques. This time, participants in the virtual world will be patients, not doctors: black women with uncontrolled type 2 diabetes. Once patients’ baseline measurements have been taken and they have been trained to use Second Life, study participants—who are being given Apple laptops and 4G modems—will undergo eight weeks of group and individual counseling sessions to “help them identify what their goals are for lifestyle change, which is the key to diabetes control,” says Wiecha. A control group will participate in face-to-face sessions at Boston Medical Center.

Questions remain: are participants more likely to be compliant in a virtual world than in face-to-face sessions? Will virtual exercise encourage patients to increase physical activity in their own lives?

“When we work and play in these virtual spaces, what impact do those experiences have on our real selves?” asks Heyden. “We don’t know, but we’re very interested in finding out.”
“CALL IT A CAREER,” of prenatal care,” says Asso- ciate Professor of Law Khiaa M. Bridges of the 18 months she spent conducting fieldwork in the obstet- rics clinic of a large public hospital in New York City. “Wealthier and middle class women can opt into a very medicalized pregnancy, and they can opt out of it too, by choosing doula and midwives and things like that.” But poor women, Bridges, can’t opt out of what she calls “the most technological of prenatal care expe- riences.” The women at Alpha—a Bridges’s pseudonym for the hospital that she analyzes in Reproducing Race: An Ethnography of Pregnancy as a Site of Racialization, published by the Univer- sity of California Press this year—all of whom qualified for Medicaid, had an excessive number of appointments, which typically involved waiting for hours to speak to a nurse, even just to hear test results. They were also screened repeatedly for STIs, tuberculosis, and hepatitis, and received numerous offers of counseling to help cope with drug abuse or abusive partners—even when the women did not use drugs or have an abusive partner. Factor in appointments with social work- ers, nutritionists, health educators, and financial officers, and what results is “a program of excess that says a lot about how we imagine poverty and poor people within our society,” says Bridges, who also served as an appointment in the Department of Anthropology.

“The prenatal care that I describe in my book looks great on paper,” Bridges says. “It’s beautiful in theory, in statute books. But in practice, it looks like a fac- tory, where women are run through services in order to produce a ‘good mother’ at the end. And when you take the racial, ethnic, and class identities of those women into account, it starts to look even more ominous.” The problem, Bridges explains, is that by assuming the worst of those expectant mothers, the system both drains hospital resources by offering in triplets who what privately insured women would receive only once, and perpetuates negative stereotypes about the values and morality of poor women, most of whom at Alpha were African American and Latina.

Though the patients themselves actually seemed to view the use of technology as a “mechanism of inclu- sion”—an indication that they are part of a society that excludes them from much else—their experience as a whole is a far cry from what jurists and others imagine pregnancy to be. “In Supreme Court jurisprudence, and in the U.S. more generally, pregnancy is imagined as this fulfilling, good thing, a moment where women can sort of realize themselves,” says Bridges. “But for poor women, it’s an occasion for the state to insert itself in their lives, to have a regulatory and often a punitive presence.”

This gap between what the law assumes to be true and what happens in real life has long fascinated Bridges. “I’ve always been interested in the inconsis- tencies within jurisprudence,” she says. “You’ll have one line of cases that imagines marriage or pregnancy one way, and a competing line of cases that take a completely different tack. As an anthropologist, I’m interested in what is, and in uncovering the sub- jects of the jurisprudence”—that is, the ages, races, and backgrounds of the people involved in specific cases—“which often reveal why we have these contradictions.”

OUT OF THE SHADOWS

Though the patients themselves actually seemed to view the use of technology as a “mechanism of inclu- sion”—an indication that they are part of a society that excludes them from much else—their experience as a whole is a far cry from what jurists and others imagine pregnancy to be. “In Supreme Court jurisprudence, and in the U.S. more generally, pregnancy is imagined as this fulfilling, good thing, a moment where women can sort of realize themselves,” says Bridges. “But for poor women, it’s an occasion for the state to insert itself in their lives, to have a regulatory and often a punitive presence.”

This gap between what the law assumes to be true and what happens in real life has long fascinated Bridges. “I’ve always been interested in the inconsis- tencies within jurisprudence,” she says. “You’ll have one line of cases that imagines marriage or pregnancy one way, and a competing line of cases that take a completely different tack. As an anthropologist, I’m interested in what is, and in uncovering the sub- jects of the jurisprudence”—that is, the ages, races, and backgrounds of the people involved in specific cases—“which often reveal why we have these contradictions.”

Bridges decided to use Western musical notation, although gender wayang music has no chromatics, for reasons of practicality. In past transcrip- tion projects, Heimarck has no chromatics, for reasons of practicality. In past transcrip- tion projects, Heimarck has no chromatics, for reasons of practicality. In past transcrip- tion projects, Heimarck has no chromatics, for reasons of practicality. In past transcrip- tion projects, Heimarck has no chromatics, for reasons of practicality. In past transcrip- tion projects, Heimarck has no chromatics, for reasons of practicality. In past transcrip- tion projects, Heimarck has no chromatics, for reasons of practicality. In past transcrip- tion projects, Heimarck has no chromatics, for reasons of practicality. In past transcrip- tion projects, Heimarck has no chromatics, for reasons of practicality. In past transcrip-
IT’S THE KIND OF ADVICE more often given in a creative writing class than the Annals of Family Medicine. But “Show, don’t tell” is one of the tips that Joanna Wilkinson, an assistant professor of family medicine and associate director of medical student education, offers to physicians who want to communicate better with patients with intellectual disabilities (formerly mental retardation). For example, a doctor might use a dummy to show a female patient how to conduct a breast self-exam, rather than simply talking her through the procedure. Because patients with intellectual disabilities often grasp specific, concrete examples more easily than abstract explanations.

Wilkinson is currently developing a metric to assess what she calls “preparedness” for mammography in women with intellectual disabilities. “I want to differentiate ‘preparedness’ from knowledge,” she says. “When we interviewed women with mild intellectual disabilities for the qualitative study published in the Annals of Family Medicine, it wasn’t necessarily that they needed more knowledge about why they should have a mammogram, or what their risk of cancer was. It was just the logistics: Where do you go? Is it cold? Do you need to have some measurable thing—this thing I’m really trying to do. None of those things had been explained to them ahead of time. I think in almost everyone’s case their physician had simply said, ‘You’re due for a mammogram.’ End of story.”

Preparedness is key, Wilkinson continues, because much of the women’s independence in their daily lives can be attributed to the fact that “they’re moving in spheres that they are familiar with. If you put them in an unfamiliar setting, they can be very anxious. By giving them a better picture of what to expect at a mammogram appointment, Wilkinson hopes to make the process less intimidating and ultimately to reduce mammogram appointment no-shows. “I believe with my heart the video will work,” she says. “But in order to be able to prove that it works, we need to have some measurable thing—this thing I’m calling preparedness—that improves.”

Research in this area is important, because many women with intellectual disabilities who undergoing mammography say they believe they need more knowledge about why you should have a mammogram, or what their risk of cancer was. Wilkinson is developing a set of questions that can be used to determine whether or not a woman is prepared for a mammogram. Here, too, effective communication is a top priority, with questions carefully framed in concrete, relatable terms.

Wilkinson first became interested in patients with intellectual disabilities when she was in private practice and gradually found herself with 20 or 25 patients with intellectual disabilities from nearby group homes. “I wanted to make sure I was doing the best for these patients that I could,” says Wilkinson. “I naively went calling preparedness—that improves.” To that end, Wilkinson hopes to cast an actress with intellectual disabilities in the starring role. “The council’s first responsibility is to advise Commissioner John Auerbach on all aspects of public health, and the second, statutory responsibility is to enact certain regulations for the betterment of public health across the state,” says Cox, who also serves on the Boston Public Health Commission, reporting to the mayor. High on the list of issues Cox would like to address and improve are health disparities, obesity, access to care, and emergency preparedness.

Cox also wants to use his association with elected officials to keep public health a priority in a time of deep budget cuts. “Public health is not a frill,” Cox says. “Public health is essential. Cut it out, and see what happens.” His work with the council can be difficult, he says, “because I get to hear some really horrible things about people’s lives.” A recent ray of light came in the form of a community greenhouse in Roxbury, the opening of which Cox attended. Built on a blighted block once filled with toxins, it had been cleaned up and converted into a useful, profitable, healthy public space. There were tomatoes for sale, and plots had been set up for local residents to tend. “It was a chance to see people who were intimately involved in actively making their lives healthier.”

Health care and communication is essential. Cut it out, and see what happens.”

Giving women with intellectual disabilities a clearer picture of what to expect from a mammogram could help reduce disparities in screening and preventative care.

A new community greenhouse in Roxbury, Massachusetts, has residents and local government working together to improve health, says Joanne Auerbach for Public Health Practice Harold Cox.

A Passion for Public Health

PASSION IS WHAT DRIVES a lot of people in health care. A passion for helping children, for example, or for fighting cancer. But a passion for infrastructure? Yes, such a thing does exist, and Harold Cox, associate dean for public health practice at the School of Public Health, is living proof.

“Public health is a universal concern,” says Cox, meaning that it must cover all aspects of health—such as immunization, food safety, emergency preparedness, chronic disease, and primary care, to name just a few—and it must reach every member in a community. “You need to be thinking of everyone’s health, and you need to be thinking of all of their concerns, all of the time.” This universality includes vulnerable, and not immediately obvious, sections of the population, he adds, such as “people whose primary language is not English, people who may not have access to newspapers or the Internet, and the elderly, who may be isolated.”

Figuring out how to channel individual passions for specific causes or demographics into a functional, comprehensive, and sustainable health care system is no easy task. But it’s a challenge that Cox enjoys, and one he will continue pursuing as a newly reappointed member of the Massachusetts Public Health Council.

“The council’s first responsibility is to advise Commissioner John Auerbach on all aspects of public health, and the second, statutory responsibility is to enact certain regulations for the betterment of public health across the state,” says Cox, who also serves on the Boston Public Health Commission, reporting to the mayor. High on the list of issues Cox would like to address and improve are health disparities, obesity, access to care, and emergency preparedness.

He also wants to use his association with elected officials to keep public health a priority in a time of deep budget cuts. “Public health is not a frill,” Cox says. “Public health is essential. Cut it out, and see what happens.” His work with the council can be difficult, he says, “because I get to hear some really horrible things about people’s lives.”

Cox also wants to use his association with elected officials to keep public health a priority in a time of deep budget cuts. “Public health is not a frill,” Cox says. “Public health is essential. Cut it out, and see what happens.” His work with the council can be difficult, he says, “because I get to hear some really horrible things about people’s lives.”

Harold Cox

A Passion for Public Health

PASSION IS WHAT DRIVES a lot of people in health care. A passion for helping children, for example, or for fighting cancer. But a passion for infrastructure? Yes, such a thing does exist, and Harold Cox, associate dean for public health practice at the School of Public Health, is living proof.

“Public health is a universal concern,” says Cox, meaning that it must cover all aspects of health—such as immunization, food safety, emergency preparedness, chronic disease, and primary care, to name just a few—and it must reach every member in a community. “You need to be thinking of everyone’s health, and you need to be thinking of all of their concerns, all of the time.” This universality includes vulnerable, and not immediately obvious, sections of the population, he adds, such as “people whose primary language is not English, people who may not have access to newspapers or the Internet, and the elderly, who may be isolated.”

Figuring out how to channel individual passions for specific causes or demographics into a functional, comprehensive, and sustainable health care system is no easy task. But it’s a challenge that Cox enjoys, and one he will continue pursuing as a newly reappointed member of the Massachusetts Public Health Council.

“The council’s first responsibility is to advise Commissioner John Auerbach on all aspects of public health, and the second, statutory responsibility is to enact certain regulations for the betterment of public health across the state,” says Cox, who also serves on the Boston Public Health Commission, reporting to the mayor. High on the list of issues Cox would like to address and improve are health disparities, obesity, access to care, and emergency preparedness.

Cox also wants to use his association with elected officials to keep public health a priority in a time of deep budget cuts. “Public health is not a frill,” Cox says. “Public health is essential. Cut it out, and see what happens.” His work with the council can be difficult, he says, “because I get to hear some really horrible things about people’s lives.”

A new community greenhouse in Roxbury, Massachusetts, has residents and local government working together to improve health, says Joanne Auerbach for Public Health Practice Harold Cox.
With the advent of faster, smaller, and smarter computers and mobile phones, people are accessing and sharing information like never before. Researchers at Boston University are looking at social and mass media from a variety of perspectives to learn how our interface with the news—and each other—is evolving, from training young journalists how to report on disasters in a changing media environment, to learning how email contributes to workplace stress.

Hoping for the Best, Preparing for the Worst

The dangers are personal. The scale can be massive. The stakes are seldom higher.

Disasters and other traumatic events present some of the most difficult challenges a reporter may ever face. Whether tragedies are man-made or natural, whether their impact is wide-reaching or individual, the choices that journalists make while covering these events have the potential to affect victims, perpetrators, and even the reporters themselves.

Professor of Journalism Elizabeth Mehren says that new reporters need more—and better—training when it comes to covering disasters and trauma, the worst kind of news.

“The culture of news and news practices have changed so that younger and younger journalists are in the field, facing immediate challenges,” Mehren

This year social media took center stage in the news, from accounts of revolutions in Africa and the Middle East, to the riots in London and the tsunami in Japan.

Mass and Social Media | BY JAMES O’BRIEN

Hoping for the Best, Preparing for the Worst
The latest additions to the twenty-first-century journalist’s toolkit

Inbox inundation
Where email and stress intersect

The Face/Time Continuum
Facebook, Twitter, reality TV, and perceptions of privacy

The TMI Index
How secure is your personal information online?
“The culture of news and news practices has changed so that younger and younger journalists are in the field, facing immediate challenges.”

Finding sources to interview in the middle of disaster and trauma scenarios—whether it’s a government official or a coherent survivor—can be tricky. And once found, reporters must tread carefully in seeking information. “The interview skills required are quite different,” Mehren says. “Interviewing victims: how do you do it? Interviewing survivors: how do you do it? Is there an ethical boundary at which you stop, because you realize that they’ve just told you too much? Or do you keep going because it’s yours?”

In addition to an awareness of issues related to ethics and tastefulness, Mehren advises reporters to go into disaster zones with an understanding of shock and its potential to affect their judgment. Students can be taught to recognize symptoms of shock, and given skills to compensate for it in the field.

She also believes reporters would benefit from explicit training in how to minimize their own negative impact during a humanitarian crisis, especially when it comes to resources that are likely to be highly limited, such as transportation, equipment, food, and water. Often, that means learning how to do without. At the symposium, for example, a TV news producer and
People would tell us many stories and be very emotionally engaged whenever they talked about email.”

“It’s very visible,” she says. “You can actually see it on the screen, it has material properties. And so email becomes your to-do list of the day.”

Grodal’s interest in this phenomenon stems from her larger research on how communication technology impacts the amount of stress that workers experience. "The boundaries between work life and, well, life."

She first assumed that "had been marinating in me for a long time." She spent the next 15 years collecting oral histories and doing archival research, tying together historical, demographic, and economic studies of the Great Migration with a survey of its vast cultural impact on American African art, literature, and identity. "She’s like a heat-seeking missile," says Louis Uchek, a professor and former chair of journalism, of Wilkerson’s undaunted search for a way to tell the story of two million lives. "She’s a woman with a mission."

So much for the paperless office. Like a stack of paperwork rising to the sky, the infinitely expandable email inbox has become a cause of work-related anxiety for many employees. According to a study recently published by Stine Grodal, an assistant professor of strategy and innovation in the School of Management, email is both a source of newfound freedom; listening to cultural consciousness. She first learned her own family’s story in bits and pieces: finding photos of her mother as a young woman in Washington, D.C., just moved from Georgia and basking in her newfound freedom; listening to her father, who left Virginia for the capital, tell tales of his time as a Tuskegee Airman.

Read more about Wilkerson at www.bu.edu/bostonia/field/wilkerson/...
says. “There was not any kind of emotional response around that, whereas people would tell us many stories and be very emotionally engaged whenever they talked about email.”

Some of the stress and negative emotions surrounding email apparently stem from the idea, voiced by several study participants, that emails should be answered within an hour. Indeed, when Grodal and her colleagues reviewed the logbooks, they discovered that those interviewees who were most emotional in their responses about email-related stress were also the employees whose workload was most occupied by meetings and telephone conversations.

“After the meeting,” says Grodal, “they come back to their office and log in to their computer, and they see all the email that has piled up during the meeting.” It can be a daunting sight.

Another belief prevalent among participants displaying the greatest levels of stress was the idea that their email was piling up all night. It distracted them at home, and in the morning before they got to the office. “This triggers people’s checking behavior,” Grodal says.

“They constantly have this voice in their head that says, ‘Maybe something has come into my inbox.’”

Because stress can lead to workplace burnout and turnover, costing companies time and money as well as human resources, Grodal encourages managers to “think about the norms around email use, and to have a clear conversation with employees about what is expected and what is not expected.”

Other suggestions for bosses include exempting employees from replying to work emails outside of business hours, or giving them a designated hour each day to catch up on messages. In a team-project setting, one worker per day could be designated to handle the project’s email communication.

“A good score, according to Terzi, would start in the 700–800 range and then improve the lower it went. Terzi rates about 450 on the scale.”

“But this was not the case before I became involved in this work,” she says of her rating. Since the project began, she has pulled access to parts of her social networking profiles, from pictures to personal details.

“I am more skeptical now,” Terzi says. “I don’t want people to see where I was on May 28. First of all, I don’t think that they should care. Why should someone know that person X is engaged to person Y? Why should you make it public?”

“TMI Index

WHat IF YOU COULD MEASURE your online privacy and get the results as a number, something like a credit score? Assistant Professor of Computer Science Evimaria Terzi is developing a tool to do just that. “In the future, people will have a privacy score,” Terzi says. “The same way they have a credit score. They go online, they check it, and they decide what to do.”

Terzi envisions that such an online privacy score will serve as a kind of mirror for users, a way to gauge just how much information they have divulged to the world via social networking applications such as Facebook, Twitter, and blogs. Currently, it takes headlines about online privacy breaches and data theft to change behavior, and then only temporarily. “You can see that people become more and more cautious when they hear of cases,” she says.

Terzi is interested in better understanding behavioral trends related to what people put online and under what circumstances, and also wants to provide Internet denizens with a reliable way to quantify how much privacy they’ve ceded—and how much they have left.

With the help of a National Science Foundation grant, Terzi and two graduate students in the Computer Science Department, Theodora Lappas and Behzad Golshan, are mining data gleaned from thousands of public online user profiles.

Once they account for a certain amount of “noise” in the data—some people, for example, don’t give out certain information, like a website address, because they are concealing it, while others lack a URL to give—Terzi and her team assign point values to the kinds of disclosure they observe. In the end, under their model, users’ choices result in a number. The higher the number, the less private the user’s online world.

“If you could measure it, you can make smarter choices about what to put online,” says Terzi. At one extreme is the idea of a privacy score? Assistant Professor of Computer Science

Evimaria Terzi

 “[When you sit behind your computer, you don’t know how many people are going to see what you put online.”

Terzi isn’t categorically opposed to online social networking, she adds—she simply wants her research to prompt awareness and a process of self-evaluation that many people seem not to apply to their online behavior. She first started thinking about online privacy after observing her colleagues’ behavior, and she plans to implement a public version of her online privacy scoring system soon.

“I feel that computer scientists, in general, are introspective people,” Terzi says. “But when they go online they get crazy. They create different personas for themselves. I have friends like that. But when you sit behind your computer, you don’t know how many people are going to see what you put online. You somehow have to get to people to question this.”

“[If you asked someone, ‘What is your privacy score?’] They would say, ‘I don’t want to know.’ We want to make people care.”

Evimaria Terzi
A second project by Tsay, with co-principal investigator Deborah S. Chung of the University of Kentucky and funding from the National Science Foundation, is examining whether audiences perceive Twitter as a source of news by analyzing viewers’ reactions to Twitter-sourcing in newscasts on Fox, MSNBC, and CNN. The goal is to find out whether tweeters are now perceived as credible contributors to broadcast news stories, and what role Twitter could play in changing the way news-sourcing works. “What we are interested in is looking at how different framings of the way Twitter is used in a news story influence how people look at that information,” says Tsay, “whether they deem it as credible or not credible, and whether ‘Twitter is changing the landscape of journalism.’

In an age of Twitter, Facebook, and reality television, people need to draw a careful line between what counts as public and private online.

Now, Tsay and her team want to see if their observations can be connected to theories about how television viewers and other users of media cultivate perceptions of privacy. Theories of cultivation—which suggest a correlation between watching violence on television and perceiving the real world as being more threatening, for instance—might help explain students’ views on online privacy. By better understanding the difference between what leads a student to see privacy as something that can be traded for fame, and what leads to a notion of privacy as something to protect, researchers could develop new ways of defining on- and off-line trends and of talking about media consumption and interaction.

When her close friend, the writer Deborah Tall, was diagnosed with terminal cancer, it was almost inevitable that poet Rosanna Warren would record snippets of their conversations and her own feelings of anguish in her notebooks. For Warren, recording in journals what she reads, sees, and hears is a way of making sense of the world. At the time, Warren says, she had no idea what—if any—of the material would find its way into her poetry. But as Tall was dying in 2006, after repeated rounds of chemotherapy, Warren says she found some of her notes beginning to take shape as poems. After Tall’s death, she went on to write a half dozen poems about her friend, which form the emotional center of her latest collection, Ghost in a Red Hat, a book she describes as something of a ghost story. The volume opens with a poem about Warren’s mother appearing, apparition-like, 10 years after her death, and concludes with a poem about the ghost of Warren as a young girl. But it is the series of poems that Warren has written about Tall that gives this collection its most powerful spectral quality. Poems like “For D.,” “At the Lake,” and “Notes” dissect the myriad ways that illness can draw friends together at the same time that it separates and distances them. These poems are filled with disembodied voices, a head bound in a lavender scarf “to hide the loss of hair,” and faces lashed of color. For me,” Warren says, poems are “among other things, instruments of discovery for the writer. These were things I needed to discover about my friend, about my friendship with her, about myself, about my own kind of blindness.” Some of the poems unflinchingly describe Warren’s inability to hear what her friend really needs to say. In one poem, the ill friend confesses, “You know I may not come through this,” to which the speaker responds: “No, no, I can’t let you, not letting you, tell me what you needed to tell me.” Warren says that she wanted readers to get a sense of Tall’s “generosity, her fullness of being.” At the same time, she remained mindful of the dangers inherent in elegies. “The risk in writing elegy is that you’re writing about yourself, you, the elegist, the survivor. And you’re writing in some childlike way. You’re saying, ‘Look what I’ve lost. Comfort me.’ “To guard against that danger, Warren made sure that Tall’s voice was heard above her own. Initially, she had composed a dozen poems about her friend, but when she looked at them together, she was dissatisfied. “My voice,” she says, “was too predominant.” So she wrote a sixth poem, titled “Aftermath,” which begins with an epigraph from one of Tall’s own poems and recounts a story that Tall related to Warren about seeing a lawn who had just been born as she, herself, was preparing to die. The poem ends with the two taking each other in: “One if you believe it, the other beyond fear. / Two creatures, side effects on one another, / headed in opposite directions.”

In all her poetry, Warren says she tries to work through “some urgent loss in my own understanding of life that needs to be un-entangled.” The art of writing about Tall and her illness was, says Warren, a way of making sense of “the complexity of friendship—the eddies of feeling, the blindnesses and selfishnesses that complicate even very close affection.” Ghost in a Red Hat is not just a collection of poems detailing Warren’s private experiences. The book also includes poems of public, political, and historic subjects as well, including what she calls “an angry poem about the power of money” (“Porta Porthos”) and another expressing outrage over the American occupation of Iraq (“Fire”).
Engineers have made impressive strides in creating artificial intelligence systems, autonomous vehicles and robots, and smart electronics. But these systems still lag far behind what living organisms can accomplish. No vehicle can navigate its environment the way a rat can, or fly easily in a crowd like a swarm of bats. No device can learn, remember, or interpret information like a human brain—or even like the brain of a small mammal or insect.

Now, a growing movement at Boston University and beyond is bringing together the disciplines of biology, computer science, and engineering to dramatically advance the state of engineered systems and push the boundaries of what human designs can do. The goal: to learn from biology to make smarter machines.

**Machines That Can Multitask**

Imagine a world in which each person could only perform one task. One excels at sensing other people’s facial expressions, another can assist in a specific kind of surgery, and another can recognize and avoid objects. No one can adapt and learn the tasks that other people know. Despite the hype that’s surrounded artificial intelligence over the years—the promise that robots and computers could do all the things humans and other animals do—artificial systems are more like this scenario of vastly limited abilities.

Designing a robot that can sense, learn, make decisions, and move on its own is the ambitious goal of a project led by Massimiliano Versace, head of the Neuromorphics Lab, which is part of the multi-institution Center of Excellence for Learning in Education, Science & Technology (CELEST), funded by the National Science Foundation and hosted at Boston University. Most robots, he explains, are designed for one particular problem.

“We’re not interested in special-purpose intelligence,” says Versace. The group’s leading project, Modular Neural Exploring Traveling Agent (MoNETA)—co-funded by Hewlett-Packard (HP) and CELEST—is a comprehensive software program referred to as a “brain on a chip.” MoNETA, as Versace and his team envision it, would eventually be an autonomous robot that can sense its surroundings, identify important information, and use that information to make decisions and perform tasks. The group’s research was recently published in IEEE Spectrum as the cover article, written by team member Ben Chandler.

The Neuromorphics Lab is developing brain models—biologically inspired algorithms that mimic the way brains work—and, in collaboration with HP, the operating system that will run on the chip. The hardware is based on an innovative type of electrical component only a few atoms wide, called a memristor. Versace explains that this technology will enable more lifelike intelligence by processing information faster and more efficiently, similar to how neurons in the brain work. Memristors are used to...
simulate the billions of synapses found in biological brains. With respect to current technology, they allow hardware designers to create chips with unprecedented density and to operate at very low power, critical design requirements for the brain of a free-moving machine. This is a major leap, as the lab is breaking down aspects of behavior and tackling them one piece at a time, creating computer models and programming simple robots to simulate ways the brain can learn and adapt. For instance, Anatoli Gorchetchnikov, research assistant professor of cognitive and neural systems, is creating computer algorithms that simulate how a rat can learn to find its way to a platform in a pool of water. Schuyler Eldridge, a PhD student in electrical and computer engineering, is working on programs for decision-making processes based on visual information, while Sean Patrick, a PhD student in cognitive and neural systems, is using knowledge about how the brain operates to enable robots to think as flexibly as animals do.

The long-term goal is to create an artificial intelligence that can think for itself. Veronne says, “There is a priori knowledge; they have to adapt and learn in the way they interact with the environment.”

The Math Behind Vision

Scientists have long known that the brain uses shortcuts to glean information from the senses. To vision, for instance, we don’t need to see all the nuances of an object to recognize it. A simple, shaky free drawing of an apple or a house is instantly recognizable as the object depicted. In 1980, the late David Marr, then a professor in MIT’s Artificial Intelligence Laboratory, attempted to explain this phenomenon using a theory of visual processing known as edge detection.

Marr postulated that humans determine information about images by finding edges, that is, a line of contrast that delineates one object from another. A line drawing thus represents what the brain is already doing—simplifying the world using edges separating discrete objects.

Being aware of this shortcut has made it possible for scientists to better understand vision, and for computer scientists to simulate visual perception through edge detection algorithms. One of Marr’s most trenchant observations was that different edges appear at different visual length scales. Looking at an aerial view of a city, for instance, different structures came into view at different heights, from the gross outlines of neighborhoods to the fine borders of individual yards. Or consider the way that different edges emerge when you blur an image to different degrees. Marr made a conjecture that by locating edges’ positions at various scales of blurring—what he called multiscale edges—it would be possible to reverse-engineer mathematically this so-called edge information and reconstruct the full original visual image.

This principle has been used extensively in computer science for practical applications like facial recognition and image processing, and has informed neuroscience research on vision in humans and other animals. But Marr’s conjecture also set up a fundamental problem for mathematicians: his approach made practical sense, but could his conjecture be proven mathematically?

“People grabbed onto this as a mathematical conjecture,” says Mark Kon, professor of mathematics and statistics at BU. Several scholars attempted to tackle the problem, and a team of mathematicians even succeeded in proving the conjecture false for images that were infinite in size, but no one could prove or disprove the conjecture for real images, which have finite boundaries.

Kon’s research deals with statistics and applied mathematics, so he has long been interested in questions that connect to problems in the real world, particularly when teaching students. Several years ago, while discussing Marr’s problem in one of his classes, Kon came upon the idea of using statistical tools known as multiscale expansions, which are used to describe electromagnetic and gravitational fields in physics, to solve Marr’s problem. He assigned the task of investigating the idea to Ben Allen, then a PhD student at BU and now a postdoctoral fellow at Harvard University. Together they produced a mathematical proof of Marr’s conjecture for finite images, which is under review at Annals of Mathematics, three decades after the conjecture was first put forth.

They work also often proof of the kind of flourishing and productive conversations that can take place between biology, computer science, and pure mathematics. In proving the conjecture behind a practical vision tool like multiscale edge and grey, Kon says, “We’ve put the icing on the cake.”
EVERY EVENING, swarms of bats leave their natal in caves and barns and descend on insects cruising through the night sky. Their effortless ability to navigate through these complex and crowded environments is the inspiration for a multidisciplinary project called AIRFOILS, which will focus on developing unmanned aircraft inspired by the flight behavior of bats and insects.

“Historically, these aircraft have not been designed to have anywhere near the kind of agility you find in the natural world,” says John Baillieul, director of the Intelligent Mechatronics Lab, and a co-principal investigator on the five-year grant from the U.S. Office of Naval Research that is supporting AIRFOILS. Led by several BU faculty members, along with researchers from the Universities of Washington, Maryland, and North Carolina at Chapel Hill, the project is drawing together experts in biology, computer science, and robotics to find ways to bring the agility of bats’ flight to small aircraft. Such vehicles are useful in both military and civilian contexts, for disaster recovery and other missions that are difficult or dangerous for human teams.

The project will involve careful biological studies of bat behavior as well as engineering studies based on that information. Thomas Kunz, a professor of biology and other missions that are difficult or dangerous for human teams.

The engineering side of the project is led by Baillieul and engineering faculty members Ioannis Paschalidis and Calvin Betke. Baillieul says that their team will use the bats’ behavior as inspiration. During a recent visit to Texas, a group from his lab flew some prototype vehicles in the bats’ territory, and discovered that the animals routinely encounter strong wind gusts. For bats, responding to gusts is a simple matter of flattening their bodies to present less surface area to the wind. Baillieul is now looking for ways to implement that kind of capability in an aircraft. “It’s going to be interesting to see how far we can push what the animals do into the realm of engineered systems,” he says.

Next, information is extracted from the bat videos by computer science professor Margrit Betke. Tracking the flight paths of individual bats is not an easy task. Betke, seated at her computer, shows a video of bats—represented by colored dots—undulating across a black screen. The bats follow a characteristic wavelike trajectory; very different from migrating birds. This two-dimensional image, though interesting, doesn’t show how the bats move three-dimensionally through their environment. To get that kind of information, Betke’s team uses multiple cameras that have been precisely calibrated. Knowing the distance between and the angle of the two cameras, they can calculate a position for each bat.

With this information, they can begin to track individual bats to learn how they travel—their speed, the angles at which they turn, how they dodge obstacles, and their foraging strategies. Even small, simple organisms like bats are able to perform the complex tasks of flying through a crowded forest canopy or finding food in their environment. Engineered systems, on the other hand, usually require a lot of energy, weight, and computational ability to manage complexity.

The engineering side of the project is led by Baillieul and engineering faculty members Ioannis Paschalidis and Calvin Betke. Baillieul says that their team will use the bats’ behavior as inspiration. During a recent visit to Texas, a group from his lab flew some prototype vehicles in the bats’ territory, and discovered that the animals routinely encounter strong wind gusts. For bats, responding to gusts is a simple matter of flattening their bodies to present less surface area to the wind. Baillieul is now looking for ways to implement that kind of capability in an aircraft. “It’s going to be interesting to see how far we can push what the animals do into the realm of engineered systems,” he says.

“Right now, there’s no eye of the storm,” says Michael Pratt of BU Technology Development (TD), “but energy is building and systems are forming” as faculty and students work with one another and with this entrepreneurial spirit to advance what he calls “innovation around innovation”—that is, novel ways to get new technologies to the people who need them most.

The process of ensuring that technologies developed by BU researchers are distributed in a far-reaching, socially responsible way happens on several levels, starting with numerous grassroots applications for faculty members in medicine, public health, and many other fields. A recent trip to Nicaragua over spring break, for example, saw 11 undergraduates and those three faculty members from the College of Engineering put senior design projects to the test in a highly cost- and resource-limited setting.

“Going to Nicaragua showed me that even simple things are complicated without the right resources, and that as a biomedical engineer, I can make devices that can improve a country’s health care system,” says senior faculty member Molly Keenan.

Two students who went on that trip are also members of the Lab for Engineering Education & Development (LEED), launched in 2010 by Assistant Professor of Biomedical Engineering Muhammad Zaman. In addition to training engineers to take the realities of life in developing nations into account, LEED aims to enable individuals in those countries to break out of the donor-recipient cycle and actively participate in improving public health.

“GATE takes the nations into account,” TD’s Global Accelerators and Ventures Director Muhammad Zaman.

Model Aircraft

WHAT DO YOU GET when you combine a vibrant research community with a sizable international population on campus and a global network of colleagues and partners around the world? A groundswell of interest and excitement like the one that’s long been building at BU, which centers on the creation—and effective dissemination—of new biomedical technologies designed for resource-limited settings and patient populations in the developing world.

“Many find answers to such questions as: Does the medical community in China or Ecuador need this device? What are the challenges to commercializing it here? How do we build a network with NGOs and ministries of health in Africa?” says Azahlu Ayrikyan, an analyst at TD. “And getting students to think about the importance of shelf life—and other things you don’t need to worry about when you’re making a device at the Photonics Center—is making them better researchers, too.”

Ayrikyan and others, in turn, help students and faculty translate their research into terms that businesses can understand. “We basically say, ‘you have all the dots in place, but you need to call them by their proper names and draw lines between them, in order for investors and companies to see a consolidation emerge, she explains. TD’s efforts to push adoption of socially responsible licensing practices began in 2009, led by then Executive Director of Technology Transfer Ashley Stevens.

“It did lengthen the negotiations, because these were new concepts to licensees,” says Stevens—who now serves as special assistant to the vice president of research—of the decision to add clauses about tiered pricing and a reservation of human rights, which would allow BU to reassert its patent if a company licensing intellectual property failed to make it available, affordably, in the developing world. “But we got it done.”

A workshop planned for 2012 will identify best practices and the way forward in socially responsible licensing for health care, agriculture, and clean technologies. Participants will include the top executives from Boston University and the University of Warwick in England, as well as CEOs, policy makers, licensing professionals, and academics from around the world.

“BU has a truly global perspective,” says BU President Robert A. Brown, “and we’re proud that our faculty are creating technologies that address needs in parts of the world that might not be the focus of others.”
A Hearing Aid That Listens to the Brain

TRYING TO HOLD A CONVERSATION in a packed restaurant can be a challenge for anyone—let’s add a companion’s words through the clattering of plates and the din of other voices. But the problem is even tougher for someone with a hearing aid. Although some devices can cancel out noise, they can’t always know which of the sounds in a noisy environment the wearer wants to hear. The result is that current aids make both distracting and desired sounds louder.

A project led by Barbara Shinn-Cunningham, professor of biomedical engineering and cognitive and neural systems and co-director of BU’s Center for Computational Neuroscience & Neural Technology, is focused on making hearing aids smarter by applying knowledge about how the brain attends to different sounds. Hearing loss affects tens of millions of Americans, says Shinn-Cunningham, and along with tinnitus (ringing in the ears), it is one of the two most common health complaints of soldiers. The U.S. Department of Defense has awarded her work a five-year, $3 million grant to work toward developing these sophisticated aids.

Shinn-Cunningham is to “understand what the signals transmitted to different parts of the brain. Their first task, says Shinn-Cunningham, is to “understand what the signatures of information are, and how they attend to different sounds. Shinn-Cunningham is now incorporating brain imaging into her research as well, to help track and understand the specific patterns of brain activity that allow us to make sense of sounds.

Her team uses both electroencephalography (EEG) and magnetoencephalography (MEG) to see synchronous neural activity and to localize the activity to different parts of the brain. Their first task, says Shinn-Cunningham, is to “understand what the signatures of information are, and how they attend to different sounds. Shinn-Cunningham is now incorporating brain imaging into her research as well, to help track and understand the specific patterns of brain activity that allow us to make sense of sounds.

Response to different frequencies. These signals are then transmitted to the brain, where they pass through multiple regions for processing. At every stop along this path, there are opportunities for the brain to interpret the sounds information coming in, and it’s this interpretive process that Shinn-Cunningham studies.

How do we know, for instance, that a set of sounds comes from a single object? How do we choose to focus on one stream of sound over another? How do distracting noises and hearing loss interfere with our ability to process sentences? Ongoing work in her lab has focused on understanding how people listen to complex information such as overlapping sounds. Initially focusing on behavioral studies that identified what kinds of information people extract from noisy situations and how they attend to different sounds, Shinn-Cunningham is now incorporating brain imaging into her research as well, to help track and understand the specific patterns of brain activity that allow us to make sense of sounds.

Her team uses both electroencephalography (EEG) and magnetoencephalography (MEG) to see synchronous neural activity and to localize the activity to different parts of the brain. Their first task, says Shinn-Cunningham, is to “understand what the signatures of information are, and how they attend to different sounds. Shinn-Cunningham is now incorporating brain imaging into her research as well, to help track and understand the specific patterns of brain activity that allow us to make sense of sounds.

Data on the chart indicate the percentage of words that study subjects correctly reported when listening to someone speaking directly in front of them while ignoring competing talkers from the left and right. As the amount of noise in the room increased, listeners of all ages found it increasingly difficult to tune out competing conversations.

BORN IN 1927, Sassan Tabatabai’s grandfather was a lifelong military man, serving in the Iranian army until the Islamic revolution of 1979. But as Tabatabai would later learn, the late Assadollah Tayyef Mohajer was a gifted writer as well as a soldier.

Mohajer ascended to the rank of major general before he escaped the Ayatollah Khomeini regime, and he later relocated with his extended family to Atlanta, where he lived out the rest of his days. Many of his compatriots were not as fortunate. Even some of those who managed to escape to Europe were hunted down and assassinated.

When Mohajer died of a stroke in 1995, he willed his eldest grandson a sheaf of handwritten papers, including poems, memoirs, and correspondence composed in a camaraderie Greek script and containing local Persian script on everything from legal pads to Post-it Notes. Now Tabatabai—who is a lecturer in Persian in the Department of Modern Languages & Comparative Literature, a humanities instructor in the Core Curriculum, and poetry editor of The Republic of Letters—is deep into the task of transcribing, translating, and annotating the collector’s 300 pages, which is as much a labor of love as it is the body of a doctoral thesis.

This doctorate, in Editorial Studies, will be the second for Tabatabai, who was in his teens when his family fled Iran, first to Germany and then to the U.S.

With degrees in political science, international relations, and communication, as well as Persian literature and history, Tabatabai has achieved prominence as a translator of classical Persian verse—and also as a poet in his own right. Tabatabai shared a special kinship with Mohajer. “My grandfather knew I liked literature and trusted me to understand his references to classical poetry,” he says.

Mohajer’s memoirs recount significant family events, some of which are set in Iran’s mountainous Kurdish north. From these documents, Tabatabai learned the story of his mother’s birth in a frigid army outpost and how the region’s lone midwife was brought on horseback to deliver the child. He also discovered details of Mohajer’s education as a baby-faced military cadet, his deep love for his homeland, and the indignation that he felt toward the Islamic Republic.

In addition to the insight that they offer into Mohajer’s personal experiences and those of his family, the documents he left behind serve as a record of nearly a century of Iranian history. Among the writings are passages relating the occupation of northern Iran by Soviet forces after World War II, and the subsequent struggle that led to the restoration of Iranian sovereignty in the area.

Mohajer never showed his writings to anyone. “He wrote it all for himself,” Tabatabai says, opening a folder to reveal a series of brief entries, as well as exquisitely penned lines of verse in the classical Persian form. “I’m trying to figure out what’s a fragment and what’s a complete poem.”

Tabatabai believes, however, that his grandfather intended his memoirs to be published someday. “He even gave the work a title: Memoirs of an Unknown Soldier.”

In “Caspian Summer,” a poem from Tabatabai’s own collection, Uzunburun, published by The Pen & Anvil Press, he writes:

When Mohajer died of a stroke in 1995, he willed his eldest grandson a sheaf of handwritten papers, including poems, memoirs, and correspondence composed in a camaraderie Greek script and containing local Persian script on everything from legal pads to Post-it Notes. Now Tabatabai—who is a lecturer in Persian in the Department of Modern Languages & Comparative Literature, a humanities instructor in the Core Curriculum, and poetry editor of The Republic of Letters—is deep into the task of transcribing, translating, and annotating the collector’s 300 pages, which is as much a labor of love as it is the body of a doctoral thesis.

This doctorate, in Editorial Studies, will be the second for Tabatabai, who was in his teens when his family fled Iran, first to Germany and then to the U.S.

With degrees in political science, international relations, and communication, as well as Persian literature and history, Tabatabai has achieved prominence as a translator of classical Persian verse—and also as a poet in his own right. Tabatabai shared a special kinship with Mohajer. “My grandfather knew I liked literature and trusted me to understand his references to classical poetry,” he says.

Mohajer’s memoirs recount significant family events, some of which are set in Iran’s mountainous Kurdish north. From these documents, Tabatabai learned the story of his mother’s birth in a frigid army outpost and how the region’s lone midwife was brought on horseback to deliver the child. He also discovered details of Mohajer’s education as a baby-faced military cadet, his deep love for his homeland, and the indignation that he felt toward the Islamic Republic.

In addition to the insight that they offer into Mohajer’s personal experiences and those of his family, the documents he left behind serve as a record of nearly a century of Iranian history. Among the writings are passages relating the occupation of northern Iran by Soviet forces after World War II, and the subsequent struggle that led to the restoration of Iranian sovereignty in the area.

Mohajer never showed his writings to anyone. “He wrote it all for himself,” Tabatabai says, opening a folder to reveal a series of brief entries, as well as exquisitely penned lines of verse in the classical Persian form. “I’m trying to figure out what’s a fragment and what’s a complete poem.”
The Way We Were (and Weren’t)

“Paris in the 1920s was like San Francisco in the 1960s. It was just the place to be,” says Brooke Blower, an assistant professor of history and author of Becoming Americans in Paris: Transatlantic Politics and Culture, published this year by Oxford University Press.

Among the American authors and painters who found their way to Paris, says Blower, are a number of surprises. It turns out that Walker Evans, famous for his iconic photographs of the Great Depression, first started taking pictures in Paris. And that Sinclair Lewis wrote Babbitt, his satire of American Midwestern culture, while in France—which is also where F. Scott Fitzgerald finished The Great Gatsby.

“Even Grant Wood,” says Blower, “the regionalist painter famous for American Gothic—the instantly recognizable painting of an unsmiling couple standing with a pitchfork in front of a farmhouse—had the epiphany that led him to paint that way during an apprenticeship in Paris.”

It’s all part of what Blower sees as the untold story of Americans in Paris after World War I. Usually, she says, scholars of the period “focus on a few famous ‘expatriates’: Ezra Pound, Ernest Hemingway, Gertrude Stein. They also tend to portray Paris ‘as a place where Americans went to be free’ from the perceived sexism, racism, and cultural narrow-mindedness of the United States at the time.”

But Blower argues that these depictions of Paris as a liberal, open-minded city tell us more about Americans than France. For an African American writer, for
instance, going abroad offered a chance to critique Jim Crow laws. But in doing so, one had to play down “the fact that France was then a colonial empire with its own racial inequalities,” says Blower, whose next book project will focus on Americans abroad during World War II, with research support from a Peter Paul Professional Development Award. “It’s a rhetorical strategy to say that you’re free in Paris, but it hides a greater complexity, which we can only discover by unearthing the fact that unlike previous generations of Americans in Paris, who tried to be “cultural chameleons,” Americans in the 1890s weren’t trying to blend in. “They were brush and bold,” says Blower. “I always think of the difference between a Winterbourne [from the Henry James novel Durrell Miller] and Humphrey Bogart’s character Rick Blaine in Casablanca. Winterbourne would be so excited to be mistaken for someone Swiss aristocrat. Rick Blaine is just as comfortable abroad as Winterbourne, he’s able to navigate the world of foreign politics, but he’s unmistakably American. He’s got this crisp, white suit, he talks with a Brooklyn accent.” Of course, adds Blower, “what gets counted as ‘American’ in this period is something we shouldn’t take for granted.” For example, neon lights, cinema, and the automobile were all invented in France, but they were recast as symbols of American intrusion, while a more rustic version of “Frenchness” began to crystallize (think baguettes and bicycles). “Now, looking back, the neon streetscape is imagined as the quintessential American urban landscape from this period,” says Blower. “But this wasn’t inevitable. Those classic icons had to be made to be American. And this is the moment when people on both sides of the Atlantic begin to talk about that, to define American-ness and decide what modern American power and culture were about.”

Lyrical poetry is all about feeling and emotion, and—unlike epic and tragic poems, which concentrate on the heroic deeds and suffering of others—it is often highly personal. For this reason, most literary criticism of lyrical poetry has concentrated on the use of the word “we,” and the varied uses to which it is put in lyrical poetry written between the Depression and the end of World War II. “The 1930s offer an especially fruitful backdrop for such study,” says Costello, “because of all the pressures of fascism and collectivism. On the one hand, there was a desire among many poets to make poetry public—to provoke change and develop some sort of community. But on the other hand, poets were wary of false universality and the oppressive power of the faceless crowd.”

Brooke Blower
Douglas Zook views the world with the mind of a scientist and the soul of an artist. Zook, a professor of science education and global ecology, is passionate about nature, conservation, and symbiosis. He is also an avid photographer, and often integrates his own images into lectures as a tool to help students better understand and respect the natural world.

In 2010, Zook spent six months in Kraków, Poland, as a Fulbright Distinguished Scholar, teaching graduate students at Jagiellonian University—alma mater of Copernicus—and assisting colleagues at the university on an ecological restoration project, revitalizing soil contaminated with toxins left by the mining of heavy metals. “You can’t recover the ecosystem to the degree that you could turn it into a forest again,” says Zook, “but what you can do is present, for example, the water that falls on that soil from draining off and going into river systems and turning into rain and moisture, even in urban environments, is fairly clean, so there’s an intermix of trees and vegetation with the glass, while not necessarily Het old, goes back much farther than glass windows in Boston.”

“The main component of glass is silicon dioxide,” he continues, “and older glass isn’t as refined and clean as newer glass. It has more metal particles, and as a result you get different reflective properties, which make the images off many Polish windows more dynamic.” The interplay between art and science translates to a larger scale, too. “Glass, which of course came from geological action within the Earth, allows us to see a different face of the planet at any given moment and space in time,” says Zook. “So these photos generate all kinds of questions.”

His fascination with “nature and plants and creatures” dates back to childhood, says Zook, but he did not consider science as a career until several years after he graduated from BU with a degree in communications. He returned to study biology, and became fascinated with symbioses while taking a course with Lynn Margulis—a course he now teaches. “It was eye-opening and intriguing, a beautiful maple tree,” he says. “It’s a simple tree, but it’s a glorious artistic expression. However, I can also get into the science behind the tree, and think about the amazing process of photosynthesis, for example. When you can make those kinds of connections, it opens many more doors. Or I suppose in my case, many more windows.”

When I began to look at my photographs on my computer, I noticed that these particular images were in some cases more beautiful and intriguing than the actual objects that they were reflecting.”

In his spare time, Zook roamed Kraków, taking pictures. He returned to the city this past spring, not only to continue to help in the research to restore damaged landscapes, but also to exhibit his photos at the university’s Auditorium Maximum, in a special event arranged by Jagiellonian University in collaboration with the city of Kraków. Titled A Hidden Kraków Revealed, the exhibition’s 33 photographs have a painterly quality and offer a unique perspective on the city as it was going to continue, page 28
swing,” says Doubleday. “And maybe he began to realize that the classic approach was perhaps best for works of literature.” Tschichold was heavily criticized for changing his views, particularly because he had been such a vocal proponent of New Typography before. “But we have the right to change,” says Doubleday, who has also written about Tschichold’s time at Penguin Books, where the designer set new standards for book production in England. “He changed to appropri- ate the design for the content. And often designers with 30- or 40-year careers kind of go full circle. Tschichold was coming home in a way, I think, to his design home.”

Even so, he had clearly tapped into something with his Die neue Typographie, a work that young designers still respond to with great enthusiasm today. “A lot of my graduate students love the New Typography,” says Tschichold, “and I kind of realize that the classic approach was perhaps best for works of literature. And maybe he began to realize that the medium is the message in a way, I think, to his design home.”

But we have the right to change,” says Doubleday, “and from that perspective in American studies,” says Patterson. “His love of Asian literature and art helped him to make his poetry new.”

“There was a very profound, long-standing, strange affinity between New England and Japan, going back to late eighteenth- and early twentieth centuries. “Because my earlier work was on Emerson,” she explains—a writer who, like many American transcendentalists, was drawn to Eastern religion and philosophy, and who in turn influenced Orientalists at home and scholars abroad. —there’s this sort of neat line.”

“Ezra Pound is a wonderful example of the necessity of global and comparative perspectives in American studies,” says Patterson. “His love of Asian literature and art helped him to make his poetry new.”

“I’m interested in revisiting an early phase of Pound’s career,” she continues, and particularly “his encounter with Yone Noguchi, whose role has really been obscured in accounts of imagism.” Imagism was a literary movement which, as the name suggests, tried to paint a picture on the page with clear, sharp lan- guage. Perhaps Pound’s most enduring imagist poem is “In a Station of the Metro.”

“The epiphany of these faces in the crowd: Petals on a wet, black bough.”

That’s the poem in its entirety, and its connec- tions to Japanese haiku—a form which Noguchi, a Japanese poet who immigrated to the U.S., helped to popularize—in terms of length are clear. Patterson suggests that Pound and Noguchi, who corresponded by letter, also shared an interest in “the condensation of haiku poetry. What haiku is, essentially, is not having to overstate anything, not having to explain.”

By examining Noguchi’s neglected influence on Pound, Patterson hopes to show the poet’s “greatness as a cross-cultural experimenter.” Readers today are put off by Pound’s racism and his fascism, she admits, and understandably so. “He says ‘Jap’ a lot. But there are moments of beauty, bravery, and discovery in his life as well as his poems. And who needs more than that?”
Coincidence, Chiasmus, Connection

PUT TOGETHER ENOUGH FRAGMENTS and patterns begin to emerge. That’s what Professor of Romance Studies Jeffrey Mehlman discovered, somewhat to his surprise, when he began to survey his decades-long career as a literary critic and historian of ideas. Looking back at the books he had written and the writers he had studied, Mehlman was struck by the “connective tissue” that began to link seemingly unconnected readings, events, and periods. “It seemed to me that the sum total of my books formed a structure of sorts.”

In what may be the profoundest coincident coincidence, Mehlman traces the roots of structuralism—an intellectual movement that developed in France in the 1950s and 1960s, and which Mehlman was among the first academics to import to the United States—back to another continent at the tail end of World War II. New York City in 1944, the place and year of his own birth. Mehlman explains: “Wartime New York was the city where French symbolism, in the form of Maurice Maeterlinck, came to live out its last years, where French surrealism, in the person of André Breton, came to survive; and where French structuralism, in the person of Claude Lévi-Strauss, came to be born.”

Which meant that structuralism—which had been “perceived as this extraordinarily complex French intellectual flower” when Mehlman first began writing about it in the 1970s—was, he says, “actually being made in New York at the same time that I was.”

Such instances of coincidences and chiasmus are recounted in Mehlman’s Adventures in the French Trade Fragments Toward a Life, published by Stanford University Press. With noes written, Mehlman found, “I was in a position to make the same kinds of discoveries, occasionally unlocking discoveries, about my own writing as about others I had written about.” Mehlman’s current book project centers on poems written by Paul Valéry during the last seven years of his life, all addressed to a woman half his age with whom the poet had fallen desperately in love.

In Mehlman’s memoir tracing the story of his own academic life, one thing was clear: where it began. As a high school student in 1960, Mehlman worked at a historic hotel in Turin, where he took guests’ children on bike tours of nearby chateaus. “The next year I was at Harvard, and they asked me what I wanted to major in,” Mehlman recalls. “It was so clear I wanted to major in the summer of 1960, which translated as French history and literature.”

In the summer of 2001, dark blankets of retting mussels stretched across the Rhode Island coastline. Two years later, silver waves of dead fish washed ashore. In both cases, the killers were large, oxygen-starved “dead zones”—areas where nitrogen and other nutrients from agricultural runoff and wastewater treatment outfalls trigger large blooms of algae, which suck oxygen out of the water upon decomposing. It’s a lethal trend that’s spreading through the world’s coastal waters. To understand it predictably, and possibly slow the growth of dead zones, which can stretch for thousands of miles, one must study the interactions of several complex physical and biological systems ranging from the microscopic intricacies of nutrients and bacteria in human land use across continents to global weather patterns, all of which are constantly in flux. Indeed, while scientists have traditionally built their careers on specialized research, they are increasingly realizing that addressing any major environmental question requires interdisciplinary expertise and tons of data. That’s what prompted Mark Fried, professor of geography and environment, and a diverse steering committee of other BU researchers to host an Earth Systems Forum earlier this year. “The Earth is a system of systems,” says Fried. “In terms of what’s happening to the planet in a contemporary sense, humans are really driving the bus.”

In terms of what’s happening to the planet in a contemporary sense, humans are really driving the bus. Frued, an associate professor of biology, says the program will help BU stake a claim on the new National Ecological Observatory Network (NEON), a nationwide web of observatories and sensors, and other equipment to gather continuous data on the soil, air, water, vegetation, microbes, and animals in the United States, split up into 20 ‘eco-climate domains.’

“The NEON mission is to make regional and continental-scale observations and measurements of ecosystems. And they want scientists to ask regional and continental-sized questions,” says Frued, who focuses on forest ecosystems and their ability to take up and process atmospheric carbon. “And they want us to do strong interdisciplinary initiatives, faculty commitment is key. The second initiative, one of the most important, is how the energy and enthusiasm are sustained, and what the capacity is to move the study of Earth systems to the next level.”

SEEING PATTERNS Jeffrey Mehlman found an unexpected link between his own life and the lives of three French writers credited with developing structuralism: a method of analysis that outlines patterns of thought, of structures, underlying all aspects of human culture; classicists from top left, seminal post–Structural Symbolist Poet Walter Benjamin; MEYER and anthropolo- gist Claude Lévi-Strauss. Jeffrey Mehlman

A SYSTEM OF SYSTEMS

IN THE SUMMER OF 2001, dark blankets of retting mussels stretched across the Rhode Island coastline. Two years later, silver waves of dead fish washed ashore. In both cases, the killers were large, oxygen-starved “dead zones”—areas where nitrogen and other nutrients from agricultural runoff and wastewater treatment outfalls trigger large blooms of algae, which suck oxygen out of the water upon decomposing. It’s a lethal trend that’s spreading through the world’s coastal waters. To understand it predictably, and possibly slow the growth of dead zones, which can stretch for thousands of miles, one must study the interactions of several complex physical and biological systems ranging from the microscopic intricacies of nutrients and bacteria in human land use across continents to global weather patterns, all of which are constantly in flux. Indeed, while scientists have traditionally built their careers on specialized research, they are increasingly realizing that addressing any major environmental question requires interdisciplinary expertise and tons of data. That’s what prompted Mark Fried, professor of geography and environment, and a diverse steering committee of other BU researchers to host an Earth Systems Forum earlier this year. “The Earth is a system of systems,” says Fried. “In terms of what’s happening to the planet in a contemporary sense, humans are really driving the bus.”

“In terms of what’s happening to the planet in a contemporary sense, humans are really driving the bus.”

Jeffrey Mehlman
Finding the key to lasting abstinence for substance abusers is a complex task, and one that has long been hampered by misconceptions and myths. Until recently, language like “no willpower” and “moral lapse” was used to refer to addicts who reverted to illicit drug use and to alcoholics who fell off the wagon. But mounting empirical evidence suggests that addiction—which takes a tragic and expensive toll on society, costing an estimated $468 billion per year in the U.S. alone—is a chronic brain disorder, affected by a complicated mixture of biological and environmental factors.

That has prompted researchers to refocus their efforts. At Boston University, this means better understanding how alcohol, tobacco, illicit drugs, and even junk food can alter the brain and how it functions, in order to help improve the health and behaviors of those struggling with substance abuse and addiction.
The Dark Side of Dieting

Does trying to shed those extra pounds make you crave junk food more? Do you end up feeling deprived and binging on the very foods that you want to avoid? That’s the “dark side”—eating to avoid feeling nervous and moody when dieting causes neurochemical substances to be released in the brain.

“Dependence often involves not simply taking the drug to ‘get high,’ but rather to relieve the anxiety associated with abstinence,” says Pietro Cottone, assistant professor of pharmacology and psychiatry, and co-director of the Laboratory of Addictive Disorders (LAD). “When we abstain from junk food, we feel bad, anxious, and we eat to relieve the anxiety. I’m looking at different mechanisms that affect how this can happen in the brain.”

Cottone was one of 12 scientists in the country to receive the National Institute of Mental Health Biobehavioral Research Award for Innovative New Scientists in 2011. His research with LAD co-director Valentina Sabino, which shows that junk food withdrawal causes compulsive eating in rats, is controversial but compelling, given that obesity among American children and adults is reaching alarming numbers. Obesity is linked to type 2 diabetes, hypertension, and other serious health disorders.

Cottone, Sabino, and several other researchers from the National Institute on Drug Abuse, the National Institutes of Health, and the National Institute on Alcohol Abuse and Alcoholism recently published their findings in the Proceedings of the National Academy of Sciences.

In their study, one group of rats was fed unlimited regular food for five days, then a sugary, chocolate-flavored diet for two days. A second group of rats was given only regular pellet food. After consuming both pellet food and junk food for several cycles, the first group began refusing the healthier food, eating more of the sugary diet, and subsequently gaining weight. When the junk food was no longer offered, the rats acted depressed and showed signs of anxiety. Back on the regular diet, they overate, and the stress factors subsided.

“The negative emotional state induced by dependence progressively increases in magnitude following every cycle of binge eating/abstinence,” says Cottone, a recipient of one of BU’s Peter Paul Career Development Professors. “And this is what people who diet do every day. Whenever we diet, we challenge our brain.”

During withdrawal, researchers monitoring the rats’ brain activity discovered increased corticotropin-releasing factor (CRF) gene expression, a key stress neurotransmitter. Blocking the CRF receptor with a single shot of a drug named R-121919 relieved the rats’ withdrawal symptoms. The drug was previously tested in human clinical trials to treat depression, but its clinical development was discontinued due to a reversible elevation of liver enzyme activity.

Cottone and his team are building on what they’ve learned about CRF receptors to look for other drugs that might help people handle the challenges of dieting.

“We know that anxiety and stress are an integral part of the maintenance of drug dependence, and now we have evidence that they play an important role in compulsive eating as well,” he says. “So we know who the bad guy is, and it’s a potential pharmacological target.”

Whenever we diet, we challenge our brain.

Pietro Cottone, right, is investigating the neurochemical triggers that cause people to binge on junk food, especially when they try to diet. continued, page 46
**The Ultimate Summer Job**

While many of his classmate searched for part-time work or the perfect internship, Laurence Spezzano decided to spend his summer with Wagner. Specifically, he studied how productions of the master’s last opera, Parsifal, have changed and evolved—performance after performance—over the past 128 years. Spezzano’s summer project, which was eventually published in The 23rd Proceedings of the National Conference on Undergraduate Research, was made possible by BU’s Undergraduate Research Opportunities Program, or UROP, which supports faculty-sponsored undergraduate research.

Now UROP has found itself center stage—again. This spring, the program earned the prestigious Beckman Scholars Program Institutional Award for an unprecedented fifth time. More than 140 universities across the country applied for this competitive three-year award—which provides scholarships and stipends for two undergraduate science, engineering, and research assistants per year—from the Arnold and Mabel Beckman Foundation. BU was one of only nine schools to receive institutional awards. UROP’s success has everything to do with the students that it attracts, and Spezzano isn’t alone in his decision to work on a project with BU faculty over summer vacation. When the program began in 1997, UROP funded 12 students. Last summer, it supported more than 200 undergraduate students, who assisted faculty on everything from neuroscience’s involvement in B-cell lymphoma to the history of the German Jewish Bible. According to Thomas Gilmore, professor of biology and UROP’s program director, high school seniors are increasingly looking for universities that offer undergraduate research opportunities. The advantages for students are obvious. Participating in research allows them to apply what they’ve learned in the classroom to a lab or real-world setting, and helps them forge deeper relationships with professors. Equally important, a research project is often a powerful guide when it comes to choose a life path.

“For some students, it’s the seminal experience in their career, when they realize that this is what they really want to do,” says Gilmore. “Other students decide after their research experience that they don’t really want to do this.” Spezzano, who worked under the supervision of Thomas Piatte, an assistant professor of musicology, calls his UROP experience one of the most important of his college career. “The UROP program gives students the skills they need to conduct research, and also helps them with time management and organization,” he says. “It’s an enormous opportunity for undergrads.” Spezzano hopes eventually to earn a PhD in musicology.

And it’s not just undergraduates who benefit, Gilmore points out. “It’s good for graduate students because most of them are going to be asked, when they become faculty themselves, to mentor junior people in their field. UROP really helps them to develop those skills,” he says. And for faculty, the fresh perspective and energy of an undergraduate in the lab can be contagious. “They make you remember why you’re doing this work,” says Gilmore—and they often make valuable contributions to the research, too. Gilmore recounts the experience of one student, Catherine Cormier, who was part of a team that was trying to determine whether certain genes were involved in B-cell lymphoma. The project was an arduous one that involved endlessly cloning and re-cloning DNA, working one gene at a time, in an attempt to identify a specific lymphoma gene. “We really had no reason to think the particular gene we studied was going to work at all,” says Gilmore. “And the testing wasn’t something that you could do over night.” But thanks to many hours in the lab, and a little bit of luck, Cormier found the gene she was looking for, a discovery that has led to more promising research on this serious form of cancer.

Gilmore emphasizes that receiving the Beckman Scholars Award again is just one piece of evidence that the UROP program continues to thrive, thanks to BU’s commitment to supporting undergraduate research. “Over the years, we’ve been really successful in choosing students who have gone on to research careers at top schools,” he says. “Our track record is very good.”

See current undergraduate research opportunities at www.bu.edu/urop
including handling glasses of their favorite brew and inhaling the aroma of hops but not drinking.

“As an example of how cues or stimuli work,” Hofmann cites a dog-phobic individual—a person who was bitten and is now fearful of dogs. By introducing the individual to a friendly animal in a controlled environment, the person learns a new association: not all dogs bite. In theory, drinkers would learn that they can be exposed to alcohol and not drink, and the alcohol cues would be extinguished.

The research group views that D-cycloserine would enhance extinction learning in the beer drinkers the way it had in individuals struggling with anxiety disorders (Hofmann and Otto have published articles on the successful application of extinction to the treatment of anxiety disorders). But a surprising thing happened. D-cycloserine actually increased the alcohol craving.

“We’re trying to figure out how D-cycloserine enhances the urge to drink,” says Hofmann, who is unfazed by the results. “Research is like peeling an onion; one layer at a time.”

Indeed, research into substance abuse poses unique issues, as Domenic Ciraulo, chair of psychiatry in the School of Medicine and psychiatry-in-chief at Boston Medical Center, can attest. The author of four books and more than 100 papers, he would be the first to acknowledge that alcohol dependence is complex.

“When someone stops drinking, the brain is left unbalanced, and the brain wants to restore its equilibrium,” says Ciraulo, about why problem drinkers are often unable to stay away from alcohol.

His research with behavioral therapy and two FDA-approved, anti-seizure drugs—levetiracetam and levetiracetam—has produced encouraging results. Unlike D-cycloserine, these two drugs target brain signals to reduce cravings.

Another area of Ciraulo’s research centers on transcranial magnetic stimulation (TMS), approved by the FDA to treat depression. It involves a helmet that monitors brain activity and stimulates the prefrontal lobe responsible for impulse control.

Ciraulo, Kantak, Otto, and Hofmann have submitted a multimillion-dollar proposal to the National Institute on Drug Abuse for a research project that would encompass four animal and three human studies aimed at enhancement learning with D-cycloserine and CBT for cocaine addiction. If the proposal is approved, Ciraulo plans to research the effects of treating cocaine addicts using TMS and D-cycloserine.

“I believe that these studies are important,” says Kantak. “We know that cues are a main contributor to why drug abusers relapse. A key tactic is to reduce the salience of those cues. The best way to do that is extinction training. But we have to know how to make it stick.”

A Tick ing Clock

WHAT KIND OF HAVOC Does cocaine wreak on the biological clock from prenatal development to old age?

That’s the question that keeps Irina V. Zhdanova awake at night. An associate professor of anatomy and neurobiology who runs the Laboratory of Sleep & Circadian Physiology, Zhdanova is currently studying the effects of cocaine exposure in zebrafish from prenatal development through old age (the lifespan of the fish is about six years). Because thousands of human babies have been exposed in utero to cocaine and other illicit drugs, understanding how to reverse the drug’s effects has significant implications for clinical practice.

“Drug use is so pervasive today, and its effect on babies in utero is not well understood,” says Zhdanova. “It’s important to start understanding the effects of cocaine from the beginning.”

Her research with post-doctoral student Eva H. Shang on prenatal cocaine exposure, published in Physiological Behavior, targets the body’s biological clock, and suggests that melatonin, a hormone produced by the pineal gland in the brain, may have a therapeutic role to play in counteracting the effects of cocaine on prenatal development. Further studies are needed, she says, to determine the potential effects of melatonin and whether the hormone can safely be administered during embryonic development.

Melatonin, with its strong antioxidant effects, maintains the body’s circadian rhythm or biological clock. It helps to control sleep, blood pressure, and the release of female reproductive hormones, among other bodily functions. The body produces melatonin exclusively at night, and if you have ever experienced jet lag it’s because your body’s melatonin production is disrupted when you are exposed to too much light in the evening.

Zhdanova and Shang’s research on melatonin’s therapeutic role to play in counteracting the effects of cocaine from the beginning.”

Another, gender-specific study with colleague Marcos A. Lepa-Patillo and others, on cocaine withdrawal, which produces long-lasting behavioral effects and anxiety, determined that female zebrafish develop anxiety earlier than males, but the anxiety-like state is more persistent in males.

“Drug use is so pervasive today, and its effect on babies in utero is not well understood. It’s important to start understanding the effects of cocaine from the beginning.”

According to Zhdanova, cocaine exposure changes the zebrafish’s pattern of brain development, affects the expression of biological clock genes, and alters melatonin signaling, growth, and transmission. She also found that prolonged exposure to the drug can disrupt neuron development.

3

Because they mature rapidly, zebrafish are the ideal tool for Zhdanova’s research into the effects of cocaine on brain development.

“I believe that these studies are important,” says Kantak. “We know that cues are a main contributor to why drug abusers relapse. A key tactic is to reduce the salience of those cues. The best way to do that is extinction training. But we have to know how to make it stick.”
Jeffrey Samet began the first of many research projects on HIV and alcohol and other addictions, and are revisiting their public health policies from mistakes made in the 1970s and 1980s, to slow the rise of new cases. One country, that lagged on addressing the crisis was Russia, where the spread of HIV/AIDS among intravenous drug users skyrocketed into an epidemic in 2000. “There is a huge chasm between the silos of HIV treatment and addiction treatment in Russia,” says Jeffrey Samet, chief of general internal medicine at the School of Medicine and Boston Medical Center and a professor of medicine and community health sciences. “There is very little communication between the two on how to coordinate care.”

One of the first of many research projects on HIV and alcohol and other addictions, and became a firsthand observer of the Soviet-era health care methods that had contributed to an alarming rise in the number of HIV cases in heroin users. By 2008, the prevalence of HIV among intravenous drug users was 27 percent in Russia, compared to 15 percent in the United States, and 1 percent in Australia, which aggressively adopted needle exchange programs.

Samet’s research in addiction medicine—which incorporates health services, behavioral, and epidemiological approaches, and has become his life’s work—involves physician education, including mentoring junior faculty on clinical research skills, and appropriate primary care for substance abusers to foster disease prevention and management. He believes that physicians can play an important role in early detection and intervention and can assess patients’ readiness to change alcohol or drug use behavior.

According to Samet, even minor intervention on the part of a physician can bring dramatic results: studies show that patients can be motivated to change, sometimes with as little as five to 15 minutes of counseling. “The only way you can convince people about changing behavior is to be clear and honest about the consequences of that behavior,” he says.

Samet also co-directs the Chief Resident Immersion Training Program, teaching chief residents from hospitals around the country about addiction. The goal is to improve their knowledge, confidence, and preparedness to teach about, diagnose, and manage substance abuse. Six months after training, 97 percent of program participants report being more likely to incorporate information on substance abuse into teaching. “Physician education is a high priority,” says Samet, who assumes the presidency of the American Board of Addiction Medicine in January 2012. “We need to bring addiction into the foreground with as little as five to 15 minutes of counseling.”

In 2000, Samet began the first of many research projects on HIV and alcohol and other addictions, and are revisiting their public health policies from mistakes made in the 1970s and 1980s, to slow the rise of new cases. One country, that lagged on addressing the crisis was Russia, where the spread of HIV/AIDS among intravenous drug users skyrocketed into an epidemic in 2000. “There is a huge chasm between the silos of HIV treatment and addiction treatment in Russia,” says Jeffrey Samet, chief of general internal medicine at the School of Medicine and Boston Medical Center and a professor of medicine and community health sciences. “There is very little communication between the two on how to coordinate care.”

One of the first of many research projects on HIV and alcohol and other addictions, and became a firsthand observer of the Soviet-era health care methods that had contributed to an alarming rise in the number of HIV cases in heroin users. By 2008, the prevalence of HIV among intravenous drug users was 27 percent in Russia, compared to 15 percent in the United States, and 1 percent in Australia, which aggressively adopted needle exchange programs.

Samet’s research in addiction medicine—which incorporates health services, behavioral, and epidemiological approaches, and has become his life’s work—involves physician education, including mentoring junior faculty on clinical research skills, and appropriate primary care for substance abusers to foster disease prevention and management. He believes that physicians can play an important role in early detection and intervention and can assess patients’ readiness to change alcohol or drug use behavior.

According to Samet, even minor intervention on the part of a physician can bring dramatic results: studies show that patients can be motivated to change, sometimes with as little as five to 15 minutes of counseling. “The only way you can convince people about changing behavior is to be clear and honest about the consequences of that behavior,” he says.

Samet also co-directs the Chief Resident Immersion Training Program, teaching chief residents from hospitals around the country about addiction. The goal is to improve their knowledge, confidence, and preparedness to teach about, diagnose, and manage substance abuse. Six months after training, 97 percent of program participants report being more likely to incorporate information on substance abuse into teaching. “Physician education is a high priority,” says Samet, who assumes the presidency of the American Board of Addiction Medicine in January 2012. “We need to bring addiction into the foreground with as little as five to 15 minutes of counseling.”

In 2000, Samet began the first of many research projects on HIV and alcohol and other addictions, and are revisiting their public health policies from mistakes made in the 1970s and 1980s, to slow the rise of new cases. One country, that lagged on addressing the crisis was Russia, where the spread of HIV/AIDS among intravenous drug users skyrocketed into an epidemic in 2000. “There is a huge chasm between the silos of HIV treatment and addiction treatment in Russia,” says Jeffrey Samet, chief of general internal medicine at the School of Medicine and Boston Medical Center and a professor of medicine and community health sciences. “There is very little communication between the two on how to coordinate care.”

One of the first of many research projects on HIV and alcohol and other addictions, and became a firsthand observer of the Soviet-era health care methods that had contributed to an alarming rise in the number of HIV cases in heroin users. By 2008, the prevalence of HIV among intravenous drug users was 27 percent in Russia, compared to 15 percent in the United States, and 1 percent in Australia, which aggressively adopted needle exchange programs.
Research at Boston University 2011

TOMORROW’S COMPUTERS TODAY

Computers have long played a memorable role in science fiction, as fans of Stanley Kubrick’s 2001: A Space Odyssey, James Cameron’s Terminator franchise, and the Matrix trilogy well know. In real life, too, they often play a starring role, though fortunately in a far less dramatic and sinister way than their cinematic counterparts. Computers today are the bedrock of modern academe, utilized in virtually every field of study, from physics and engineering to biology, medicine, and the humanities. Two new initiatives demonstrate Boston University’s strong commitment to remaining at the vanguard of advanced scientific computing.

Across the Board

FOR YEARS, BU HAS BEEN AT THE FOREFRONT of high-performance computing—installing one of the first massively parallel supercomputers in American higher education in 1988 and, more recently, a Blue Gene supercomputer capable of producing enough calculations in one second to fill a cash register tape 18 million miles long. Currently, BU researchers are looking beyond the “number crunching” capability of computers to sophisticated modeling and computational processes.

The Rafik B. Hariri Institute for Computing and Computational Science & Engineering, which opened in September 2011, will not only propel discovery and innovation through the use of state-of-the-art computational approaches, but also will catalyze advances in the science of computing by taking inspiration from challenges faced, and overcome, by a multitude of disciplines, says founding director Azer Bestavros, a professor of computer science.

The institute’s affiliated faculty will collaborate on research and educational initiatives targeting four broad application-based “clusters”: biology and medicine; physical science and engineering; social and management sciences; and the arts, communication, and education.

“In today’s environment of pervasive data acquisition and ubiquitous communication, computing has become an indispensable ‘third leg’ of discovery, along with theory and experimentation,” Bestavros says. “Computational thinking and methods provide the critical spark that drives innovation across virtually all areas of intellectual endeavor.”

As a hub for interdisciplinary research collaborations, he continues, the institute is well poised to initiate projects aimed at developing new computing models, methods, tools, and artifacts.

Trustee Bahaa Hariri, the son of assassinated Lebanese Prime Minister Rafik B. Hariri—who received an honorary degree from BU in 1986 and served as a trustee from 1990 to 2003, and for whom the School of Management building is named—pledged $15 million for the project. “Supporting great research universities is an act of faith and a resilient commitment to contribute positively to the well-being of societies,” he says.

“Computing-based approaches are critical for interpreting the ever-increasing amounts of data...”
being collected and are becoming a creative tool in all disciplines,” says Vice President and Associate Provost for Research Andrei E. Ruckenstein. A survey of projects by faculty affiliated with the new institute bears out this claim.

Jim Collins, for example, a biomedical engineer and William Fairfield Warren Distinguished Professor, uses computational approaches to aid in the design of genetic circuits. Collins is particularly excited for the Hariri Institute because, he says, “It will expand our capabilities in synthetic and systems biology.

Collin’s research focuses on developing nonlinear dynamical techniques and devices to improve and mimic biological function. His work in complexity science has spurred new devices to treat stroke-induced brain damage, research that, he says, “is crucial for the interpretation of unbound, and evaluate matrix elements crucial for the interpretation of collider experiments.”

According to Bestavros, the Hariri Institute will support both research projects and workshops that bring together faculty, research staff, and students, as well as visiting scholars. The facility will also accommodate up to 20 researchers and provide institute affiliates with much-needed “think space,” as well as a 60-seat seminar room equipped for telecommunication.

The official institute launch included a series of workshops on the technical and societal challenges associated with cyber security and support of research projects on green computing that connect with another new BU computing initiative, the Massachusett’s Green High Performance Computing Center.

A Win-Win-Win Situation

WITH ITS ELABORATE CANAL SYSTEM and profitable location along the Connecticut River, Holyoke, Massachusetts, was once the world’s largest paper manufacturer. Today, it is one of the poorest communities in Massachusetts with a poverty rate three times the state average and unemployment hovering at 13 percent. But that could soon change.

At a projected cost of $686 million, the Massachusetts Green High Performance Computing Center (MGHPCC) will provide an infrastructure for research computing in life sciences, clean energy, and green computing—all powered by alternative energy from the Holyoke Dam—while also playing a role within a broad, locally driven effort to revitalize downtown Holyoke.

“This is the largest public or private project in Holyoke in more than thirty years,” Governor Deval Patrick was quoted as saying in October 2010. “The new facility will be a magnet for innovation and job creation for years to come. We are investing in the future of this region.”

Touted as “a gateway for innovation in the Pioneer Valley,” the MGHPCC is being built by a groundbreaking consortium of educational, government, and industry partners, including the Commonwealth of Massachusetts, Boston University, Harvard, MIT, Northeastern, and the University of Massachusetts, as well as two of the state’s top-tier technology hubs, EMC Corporation and Cisco Systems, Inc. Together, the universities have pledged $50 million toward the project, with Cisco and EMC contributing $25.5 million apiece, and Governor Patrick promising, $25 million from the state.

Representing BU on the board of the MGHPCC consortium are: Andrei E. Ruckenstein, who serves as the president of the corpora- tion, the chair of the executive committee of the High Performance Computing Center, and as the chair of the steering committee of the university consortium; Cara Ellis McCarthy, clerk of the board of directors; Tracy Schneider, vice president for information services & technology; Gary Nickis, senior vice president for operations; Glenn Bressanah, director for scientific computing & visualization; John Barton, executive director for facilities manage- ment, BUMC; Stephen Williams, associate general counsel; and William Bestavros, associate vice president for financial & business affairs, BUMC.

Azer Bestavros, a professor of computer science and co-chair of the MGHPCC education and outreach committee, says it’s uncommon for a partnership to emerge among the private sector, academia, and the Commonwealth. “I’m not aware of another of its kind,” he says, “To have five internationally renowned institutions join together like this—it’s rarity.”

But it makes sense. Each university currently uses its own net- work of computers, spending millions of dollars each year on elec- tricity and individual infrastructure. So why not put those computers in a central space, share the costs, and take advantage of Holyoke’s cheap, green electricity? Bestavros hopes that, in time, even more industries and universities will come on board.

According to John Goodhue, executive director of the MGHPCC’s university consortium, the facility will have the potential to accelerate progress in modeling complicated systems like climate change and the human immune system.

Computers are invaluable scientific tools, Goodhue says, not least for the way in which they enable research to take place at speeds that would have once been untouchable. Take, for example, the ways in which engineers design automobiles, airplanes, and bridges. “Instead of building physical models,” he explains, “engineers build virtual ones, which are less expensive and actually produce more accurate results. Design cycles are shorter, the quality of output is better, and you build fewer prototypes.”

Normally, the catch to supercomputers is that they require tremendous amounts of energy and generate a thousand times more heat than a laptop—a conundrum for those seeking to minimize their carbon footprint.

“A statewide search for an environmentally-friendly location led to Holyoke. With its low-cost, green electricity from hydropower and its proximity to high-speed fiber connections, the city was an ideal spot. To minimize sub- urban sprawl, Goodhue says, the consortium chose to build the center on an old industrial site downtown. “While we had to do some cleanup before starting construction, it was clearly the better environmen- tal choice.”

Construction on the LEED-certified structure began in summer 2011, and Goodhue expects the facility to be fully operational by the end of 2012. Once the center is up and running, he plans to develop an educational and training center as part of the operation, net- worked with local high schools and community colleges. And while the center itself will only employ about 20 people, Goodhue predicts it will leverage state and private resources to bring related busi- nesses to the area. “We want this collaboration to benefit the city of Holyoke, too,” he says.  

The new facility will be a magnet for innova- tion and job creation for years to come. We are investing in the future of this region.”

Holyoke, Massachusetts
From Petrologist to Provost

**A QUICK NEW ENGLAND TIP:** Don’t move here in January, especially if you’re coming from Los Angeles. Jean Morrison, the new University Provost and Chief Academic Officer, arrived on campus early this year, just in time to dig her way out of 72 inches of snow. “I’m originally from New York,” she says, laughing, “but I have to admit, this winter was a shocking reintroduction to East Coast weather.”

Formerly Executive Vice Provost for Academic Affairs at the University of Southern California, Morrison succeeded University Provost David Campbell, who returned to teaching and research projects he’d set aside more than five years ago.

“The opportunity to join one of the nation’s premier research institutions is amazing,” she says, “and makes for some creative and unique possibilities.”

A nationally recognized geologist and professor of earth science, Morrison describes herself as a teacher at heart. In addition to holding a number of administrative posts at USC, she earned the University’s highest teaching honor and founded its Women in Science and Engineering program.

“Jean has the academic experience, skills, and vision to help the University continue on the path of increasing quality and impact,” says BU President Robert A. Brown.

As Provost, Morrison’s responsibility is twofold: to support the president and help implement his vision for the University, and to support academic deans and faculty members in improving the quality and stature of each school and college. To that end, she says, “We’ve put together a process of academic program review that will help us understand the strengths and weaknesses of our programs. I think with additional growth and support, our PhD programs in critical disciplinary fields will be absolutely top tier.”

The similarities between USC and BU will serve her well, Morrison continues, because both are large, urban research universities with significant undergraduate and graduate populations. “They’re both characterized by a college of arts and sciences and an array of professional schools,” she says. “Having had experience with the full breadth of disciplines and learning environments should be very helpful.”

With a background in metamorphic petrology—the study of how the Earth’s crust changes over time—Morrison says the nature of being a research scientist is being a problem solver. “There are aspects of being a researcher that roll into being an administrator,” she says. “There are complex systems in place in both environments that need to be understood to make the system run more smoothly.”

Thus far, Morrison says she is elated with her new position. “It’s an incredibly exciting time to be at BU,” she says. “There are many great things on the horizon.”

This year Boston University welcomed a new provost and three new deans, and also honored three senior faculty members for their past and continuing contributions by naming them William Fairfield Warren Distinguished Professors. Here is an introduction to the new and familiar faces leading the way at BU.

**LEADING THE WAY**

As Provost, Jean Morrison plans to leverage BU’s strengths in the arts and sciences as well as its professional schools.
A Talented Trio

KENNETH W. FREEMAN DEDICATED HIS FIRST YEAR as Dean of the School of Management to “listening and learning.” The former CEO of Quest Diagnostics—who helped to turn an embattled corporation facing massive challenges into the leading provider of diagnostic testing—met individually with virtually every member of the faculty, and engaged broadly with students and alumni.

Freeman calls the position “a dream come true.” He intends to build on the momentum created under the leadership of Louis E. Lataif, who served as Dean for 19 years, during which time the School dramatically improved in the rankings. “We have an opportunity to become an elite business school,” Freeman says.

“A start with the bedrock,” says Juárez, who succeeded Freeman as Dean in August 2010. “That is, comprehensive knowledge of all management disciplines and a grounding in ethics and social responsibility. From there we go to global leadership experiences. We strive to differentiate the School through a focus on innovation across the sectors of health, digital technologies, and energy and the environment. Leading research and teaching are our pillars, which lead to our roof, which is about creating value for the world.”

A LONGTIME ADVOCATE of the arts—whether visual, musical, or theatrical—Benjamín Juárez believes that art has a part to play in everyone’s life. As Dean of the College of Fine Arts (CFA), he is reaching out to the entire BU campus, not just the 2,000 students enrolled in CFA.

“I want everyone—students, faculty, staff, administrators—to experience the talent we have here,“ says Juárez, who succeeded Dean Walt Meissner in August 2010. “We need strategies that bring the arts into the perspectives of the fields of interest of each school and each community.”

Born and raised in Mexico City, Juárez is a music scholar and world-renowned conductor who has led orchestras in venues from Shanghai to the Champs-Élysées. He cannot remember a time when music was not an important part of his life. “I’ve always found solace and connection in the motion of it,” Juárez says. “It holds emotions that would otherwise be beyond my grasp.”

Conducting appeals to him, Juárez says, for the “multiple perspectives” it offers on music. He likewise brings substantial administrative experience to complement his passion and vision, having formerly served as director of culture, technology, and development at the Dr. José María Luis Mora Research Institute, and director general of Mexico’s Centro Nacional de las Artes.

SEASONED ENTREPRENEUR Christopher Muller is determined to revolutionize the School of Hospitality Administration with an unlikely tool: the iPad. His first endeavor as new Dean was to overhaul the School’s technology system by moving its curriculum to a tablet-based learning environment, and to purchase iPads for each member of the faculty and administrative staff.

“If we want to address the academic and theoretical needs of the Class of 2015,” Muller says, “we have to look to the future, not the present. It’s our job as educators to prepare our students for the technology of tomorrow.” The School is also converting its textbooks to e-publications, which Muller says will greatly enhance students’ learning experience.

“We’re on the cusp of being one of the greatest hospitality schools in the nation,” he says, while emphasizing the importance of technology to remain competitive in the hospitality industry. “This expansion will only propel us forward.”

Muller previously taught at Cornell University and was a founding faculty member at the University of Central Florida’s Rosen College of Hospitality Management, which now has 2,700 students. Among his entrepreneurial ventures were ‘Za Bistro!, a café in Maitland, Florida, and Education Matters, a popular blog for the online trade publication Lodging.

Breadth and Depth

NAMED FOR BU’S FIRST PRESIDENT: the William Fairfield Warren Distinguished Professorships are “the highest honor bestowed upon senior members of our faculty who continue to be involved in research and scholarship, as well as in the civic life of the University,” says President Robert I. Brown.

Last spring, Brown announced the appointment of three new Warren Professors, bringing the total to eight. The endowed professorships are supported by the William Fairfield Warren Fund, and the University hopes ultimately to name as many as 15.

INTERNATIONALLY KNOWN as “BAT MAN,” Thomas Kunz, whocellebrated his 80th birthday at BU last year, has spent the past 45 years researching the winged mammals.

A biology professor as well as the director of the Center for Ecology & Conservation Biology, Kunz has studied bats on three continents.

His research made headlines last year when he predicted the possible extinction of the North American little brown bat—a once common and still ecologically essential creature—by a little-understood disease called white-nose syndrome.

“We think we’ve traced the disease’s origin to a fungus found in caves throughout the Northeast,” he says. Genetic comparisons indicate a close resemblance to a fungus found in Europe, and Kunz suspects that the invasive species was likely tracked into U.S. caves by European tourists.

Carrying the fungus—propelled by the action of fans in caves—bats in Europe are not dying, indicating that European bats have developed a resistance to the fungus, or that the fungus mutated when it reached the U.S. Either way, Kunz says, the effects of white-nose syndrome—along with another new threat to bat populations: wind turbines—could be devastating.

“Bats eat almost half their body weight in insects every night during the warm months,” he says. “Given that more than one million little brown bats have already died from white-nose syndrome in the northeastern U.S., this means that over 630 metric tons of insects per year are not being consumed. If the species goes extinct, imagine the devastation its loss will have on the agricultural industry.”

A PHYSICIST, Eugene Stanley uses statistical analyses to research diverse topics ranging from catastrophic failure cascades in coupled networks to Alzheimer’s disease. His most recent project involves developing techniques to predict whether a financial crisis similar to the crashes of 1929 and 2008 has a good chance of occurring within the next 50 years. His prediction? A resounding yes.

“Making sense of complex stock fluctuations is very challenging;” he says, “so my students and I try to adapt methods used to analyze other complex signals such as heart rate fluctuations.”

A member of the National Academy of Sciences, Stanley has taught at BU for 35 years. In 1973, he spoke out against the decision to deny refuseniks admission to a Russian scientific conference where he was speaking. Security officers escorted him off the stage and threatened to toss him out the top-floor windows of Moscow State University.

Later, Stanley led conferences to the home of one refuse-nik and established an organization that encouraged other foreign scientists to visit the homes of refuseniks. Those efforts, combined with his efforts to uncover the reason why there are so few women in physics, won him the American Physical Society’s Nicholson Medal for Human Outreach in 2003.

STUDENTS WHO ENTER, in courses taught by law professor Wendy Gordon get a two-for-one deal. An expert on copyright and trademark law and related fields, Gordon interweaves her classes with material from disciplines other than law. Depending on the course or year, students might read literature by Herman Melville or William Shakespeare, enact a “prisoner’s dilemma game” from economics, or study philosophical texts by John Locke.

One puzzle that Gordon has posed to her students compares a parable from Dostoevsky’s ‘The Brothers Karamazov’ with a scenario drawn from the short story “The Ones Who Walk Away from Omelas” by science fiction writer Ursula Le Guin. In both works, characters are forced to choose between the safety—or sacrifice—of an individual and the well-being of a larger community.

“The law evinces many tensions between the desire to treat the mass of people well, and the desire to respect individual rights,” says Gordon. “The distinction between active and passive behaviors relates to this in interesting ways. So does the distinction between harm and benefit. These concepts are like different directions on a moral compass, pulling us this way and that. Through stories and puzzles, I want my students to explore such abstract issues on a day-to-day human level.”

Gordon, whose scholarship has been cited in three U.S. Supreme Court opinions, has twice served as chair of the Intellectual Property Section of the Association of American Law Schools.
In a unique procedure, Alhabsi harvests dental stem cells from third molars—taken from patients at BU’s Dental Center—and seeds them into a scaffold, a miniature sponge-like carrier. The scaffold is inserted into an extracted human tooth and then implanted into the body of a mouse, which serves as a substitute blood supply for tissue regeneration. After three months, if successful, the tooth is removed from the rodent with the regenerated dentin and dental pulp. When the technology reaches humans, the scaffold would be implanted directly around the broken or decayed tooth and the empty root canal space would eventually fill with pulp-like tissue, and dentin-like tissue would regrow on the dentinal wall. But that’s years away. The next phase of Huang’s and Alhabsi’s research will involve working with the teeth of large animals like pigs.

“We could regrow the lost structure without having to make a big crown, just do some minor patching,” says Huang. “We have data in animals that indicate that it’s a real possibility. Normally, we just discard wisdom teeth and baby teeth. Now we’ll definitely advocate to preserve them.”

Huang says the valuable cells remain viable for about a month after extraction if stored under the right conditions, but are at maximum potency just after they are removed. More dental stem cell banks are opening to meet anticipated demand, he notes. After Alhabsi finishes her work at BU, she says, plans to advance stem cell centers in Saudi Arabia, where she will take a position as an assistant professor in the endodontic department at King Abdulaziz University in Jeddah.

In related research, Huang has successfully reprogrammed dental cells into embryonic-like cells—called induced pluripotent stem (iPS) cells—which may prove an unlimited source for tissue regeneration, and perhaps eventually whole teeth. Up until now, scientists had been able to create iPS cells from mice or from certain types of human cells such as fibroblasts, which are considered important cellular elements of tissue integrity. But all three types of human dental stem cells Huang and Alhabbi tested were easier to reprogram than fibroblasts, previously considered the best way to make human iPS cells. Huang is quick to point out that regrowing a whole tooth from scratch, while being tested in large animals, is still a ways off for humans.

“There’s always a new technology replacing old technology,” Huang says. “Nowadays, dental implants are very successful. You get a tooth pulled, you put in an implant. But it took thirty to forty years to get to this stage. Perhaps in the future, we’ll be regrowing a whole tooth, and that may take thirty years, but once the technology is mature, it may replace dental implants.”

---

Meital Altull (Electrical & Computer Engineering) received Young Investigator Awards from the IEEE Photonics Society and the Office of Naval Research. Amy Angold (English) was named an External Faculty Fellow at the Stanford Humanities Center. Qianshen Bai (Art History) received a senior research fellowship from the National Endowment for the Humanities. John Ballitoul (Mechanical Engineering) was awarded the IEEE Control Systems Society’s Hendrik E. Bode Lecture Prize. Susan Baloul (Dentistry) earned the Milos Hetman Research Award from the American Association of Endodontists. Marlene Oscar Berman (Anatomy & Neurobiology) received the Society for Alcoholism’s Henri Begleiter Excellence in Research Award.

Azar Beztovar and Mark Crowella (Chemical Science) received the ACS SIGMERIC Text of the Year Award. Crowella was also named a Fellow of the Association for Computing Machinery.

Thomas Bifano (Mechanical Engineering) and a team led by the Lawrence Livermore National Laboratory and including BU spinoff company Broc Machinery Corp., won an R&D 100 Award for their “Microfabricated Adaptive-Optics Optical Coherence Tomography” technology.

Irvig Biege (Biomedical Engineering) and Abdul Teich (Electrical & Computer Engineering) were named fellows of SPIE, the international society for optics and photonics.

Lows Bramowen (Endocrinology, Diabetes & Nutrition) received the H. Jack Baskin, MD, Endocrine Teaching Award from the American Association of Clinical Endocrinologists.

Jerome Brody (Pulmonary Center) received the Ochsner Clinic Foundation’s Alton Ochsner Award Relating Smoking & Disease.

Archie Burnett (Editorial Institute) received the John T. Sheehan Award from the Milion Society of America.

Phyllis Carr (Instructional Medicine) was named a Fellow of the American College of Physicians.

Dino Christensen (Political Science) received the Tom Cook Award from the Political Communications Division of the American Political Science Association (APSA).

Jain Cockburn (Strategy & Innovation) was awarded the Dan and Mary Lou Slatkin Award.

Ellen Cohen (Occupational Therapy) received the American Occupational Therapy Foundation’s A. Jay Abrams Award.

James Collins (Biomedical Engineering) was elected to the National Academy of Engineering and also received the Institute for Scientific Interchange Foundation’s Lagrange-CRT Foundation Prize.

Barbara Corkey (Otolaryngology) was awarded the Blanting Medal for scientific achievement from the American Diabetes Association.

Pietro Cottone (Pharmacology) and Michael Silverstein (Pharmacology) received the Robert Observat Research Award for Innovative New Scientists from the National Institute of Mental Health.

Harold Cox (Community Health Services) earned the Massachusetts Public Health Association’s Paul Reeves Award. He was also reappointed by Governor Deval Patrick to serve on the Massachusetts Public Health Council.

Larry Culpepper (Family Medicine) received the Maurice Wood Award from the North American Primary Care Research Group.

Adrienne Cuppis (Biostatistics, Epidemiology) earned the Janet L. NORWELL Award for Outstanding Achievement by a Woman in the Statistical Sciences from the University of Albemarle at Birmingham’s School of Public Health.

Michael David (Internal Medicine) earned the Massachusetts Department of Public Health’s William A. Hinton Award.

Lydia Diamond (Theatre) won numerous awards for her play, Stick Fly, which was named Best by the LA. Drama Critics Circle and the Los Angeles Times. David was awarded the Best Paper Award from the Strategic Management Society.

Elena Cohen (Occupational Therapy) received the American Occupational Therapy Foundation’s A. Jay Abrams Award.

Susan Eckstein (International Relations) received an award from the APSA Section on Race, Ethnicity and Politics for the best book on race, ethnicity, political participation, and public opinion for The Ingroup Outgroup: How Cuban Americans Challenged the U.S.df and Their Homeland.

Sean Elliott (Chemistry) received his second Sisalow Award from the Research Corporation for Scientific Advancement, to support his research on solar energy conversion.

David Ferry (Creative Writing) won the Ruth Lilly Poetry Prize from the Poetry Foundation.

Joshua Fineberg (Music) received an Artistic Fellowship from the Massachusetts Cultural Council.

Adrian Final (Biology) was named a Distinguished Alumnus by the University of New Hampshire’s College of Natural Resources.

Colin Fisher (Organizational Behavioral Management) received the Academy of Management’s Newman Award for Best Paper Based on a Dissertation.

Francis Gourio (Economics) received the European Central Bank’s Lamfalussy Fellowship.

William Grimes (International Relations) was appointed to the Council on Foreign Relations.

Davidson Gomer (Center for Global Health & Development) received an Award for Outstanding Review from the journal Clinical Infectious Diseases.

James A. Hamilton (Physics & Biophysics) received the Biophysical Society’s Award for Excellence in Lipids.

Xue Han (Biomedical Engineering) and Pankaj Mehta (Pharmaceutical Sciences) received Sloan Research Fellowships from the Alfred P. Sloan Foundation.

John Harris (Economics) was named an External Faculty Fellow by the American Economic Review on the occasion of the journal’s centennial, when his 1970 article “Migration, Unemployment and the Theory of Wages” was named one of the top 20 articles published by the AER so far.

Jeffrey Henderson (Classical Studies) was elected to the American Academy of Arts & Sciences.

Michelle Henshaw (Health Policy) received the American Dental Education Association’s William J. Gass Award for Vision, Innovation, and Achievement.

Patricia Hills (Art History) received the College Art Association’s Distinguished Teaching of Art History Award.

Jaakko Hintikka (Philosophy) was awarded the Bereke Prize by the American Philosophical Association.