NSF Awards Investigators over $3.25M for ‘Big Data’ Research

Projects Will Develop Advanced Network Technologies and Facilitate Biomedical Studies

We live in the age of “Big Data.” Every second, massive amounts of digital information are produced, stored, retrieved, analyzed and transferred around the world from such diverse sources as hospitals, government agencies, social networks, Internet search engines, stock markets, airlines and credit card companies.

Here at UMass Lowell, an interdisciplinary team of researchers is harnessing the power of Big Data by building a campus network cyberinfrastructure that will enable users to quickly access and share vast datasets with their counterparts in the Amherst, Boston, Dartmouth and Worcester campuses. It will also allow for faster and more efficient virtual experiments, simulations and modeling through the Massachusetts Green High Performance Computing Center in Holyoke.

The effort recently received a huge boost from the National Science Foundation when the agency awarded more than $3.25 million in support of high-speed computer networking research at UMass Lowell.

“This will position the university in a leading role in advancing network technologies and accelerating Big Data and biomedical research,” says Assoc. Prof. Yan Luo of the Department of Electrical and Computer Engineering.

“The methodologies developed from the projects can ultimately lead to breakthroughs or discoveries in a wide range of endeavors, from studying the weather and monitoring the environment to fighting terrorism, designing a new drug and finding cures for deadly diseases.”
Learning with Purpose

Researchers Harness the Power of the Sun

Solar Fuels Could Provide Alternative Energy Source

Mechanical engineering Asst. Prof. Juan Pablo Trelles loves the sun. The sun’s energy, that is. Trelles and his team are investigating whether it is possible to synthesize sustainable fuels using solar energy and carbon dioxide (CO$_2$)—the primary greenhouse gas—in combination with water or methane, byproducts of natural gas that can also be broken down by solar energy to produce hydrogen for fuel.

“Solar fuels could provide an alternative to fossil fuels while mitigating greenhouse-gas emissions,” says Trelles, who directs the department’s Re-Engineered Energy Laboratory.

“We use concentrated solar energy to directly decompose CO$_2$ at high rates. Together with water or methane, it can form artificial hydrocarbons as fuel,” explains Trelles. “Alternatively, we can use solar energy to break down water or methane to create hydrogen as clean fuel. Developing the technology to produce solar fuels efficiently and cost-effectively has become the goal of several research groups worldwide, including our lab. One advantage of our process is that it could treat CO$_2$ directly as emitted from power plant exhausts, which makes it potentially more economically viable than other approaches.”

The team is also investigating the direct use of electricity in the form of plasma—ionized gas that conducts electricity, as found inside fluorescent or neon lamps, in lightning or in the sun’s corona—for producing sustainable fuels.

Whitten-Woodring Finds Free Media Can Amplify Political Divisions

Asst. Prof. Jenifer Whitten-Woodring is an award-winning newspaper and radio reporter turned political scientist who studies the effects of media freedom on human rights and political stability around the globe—with some surprising findings.


Whitten-Woodring is also an associate of the Center for Women and Work and teaches in the Global Studies and Peace and Conflict Studies programs.

Professor Recognized for Book on Media Freedom


Sousa and Falcón also visited two other foundations: the Luso-American Education Foundation and the Camões Institute. The first helped underwrite a Portuguese writer-in-residence and an adjunct professorship for one semester each, starting in fall 2015, while the second is sponsoring a yearlong adjunct faculty position to teach Portuguese language and culture.
Art Prof’s Work Earns Fellowship

Repeat Honor Testament to Stephen Mishol’s Creative Excellence

For the second time in his career, Assoc. Prof. Stephen Mishol has been honored by the Massachusetts Cultural Council through its Artist Fellowship, which recognizes exceptional work by Massachusetts artists.

While the $12,000 fellowship was granted for a series of Mishol’s graphite drawings, it is also designed to help ensure he continues creating new work.

“The drawings are part of an ongoing body of work examining the nature of the modern landscape and environment,” says Mishol, who teaches painting and drawing in the College of Fine Arts, Humanities and Social Sciences. “They are not of a specific place: Rather each drawing is a collection of information that comes from various sources—observation, memory and invention—and it is then woven together through a long process in the studio. I want the images to parallel how one moves through these places of vast accumulations of change.”

The MCC Artist Fellowships are awarded annually in three categories to “provide direct, unrestricted support to Massachusetts artists in recognition of exceptional original work; to foster the creation of new art in the Commonwealth.”

The honor, says Mishol, leaves him feeling blessed, and proud of his university and city.

Mishol’s first MCC Artist Fellowship was awarded for painting in 2008.

Assoc. Prof. Stephen Mishol has earned a second MCC Artist Fellowship in recognition of his ongoing artistic work.

Art Students Have Designs on Greater Good

Class Creates Motion Graphics for Local Autism School’s Fundraising Efforts

Nine students from the Art Department’s Design in Motion class recently put their graphic design talents to work for Melmark New England (MNE), a school for autistic children and teens in Andover.

MNE is a nonprofit educational and clinical organization serving hundreds of people with autism spectrum disorders each year. Despite autism’s prevalence, effective treatment can be elusive, especially for those most seriously affected.

In order to expand the school and residential programs, Melmark relies upon charitable donations from individuals, foundations and local companies.

Enter UMass Lowell Visiting Lecturer Regina Milan and her graphic design students.

“Students were asked to convey the importance of Melmark’s mission through 60-second motion graphics that would be used for fundraising,” says Milan. “I wanted to do two things with this project: let my students see that design lives everywhere and give them a real client/designer relationship to navigate.”

Motion graphics are animated videos combining words, sound, pictures and video and can be used in an introduction to a fundraising event, on YouTube, on Melmark’s website or in an email message.

For Derek Kunze, an art major with a graphic design concentration from Methuen, working with Melmark was immediately different from other design assignments.

“We came and got a tour of the school and met students and staff,” says Kunze. “The design work became personal fast once I saw the work that is done there and the unbelievable dedication of the staff to help their students live better lives.”

UMass Lowell students, from left, Kelly Freitas, Derek Kunze, Kristen Racamato, Alana Kelley and Jenna Freitas collaborated with Melmark CEO Rita Gardner, right, on student-created motion graphics.

Research Fund to Benefit Psychology Students

Prof. Richard Siegel Endows Scholarships to Give Back

Research has taught Psychology Professor Richard Siegel many things over the course of his almost 50-year career—including how essential it is for his students to conduct their own hands-on research.

To make sure they have that opportunity, Siegel, who is chair of the Department of Psychology, recently endowed a fund that will provide support for undergraduate and graduate students pursuing faculty-supervised research.

“As a department, we’re increasingly emphasizing the science of psychology,” he says. “We’re encouraging our students to engage in scientific research, whether by assisting faculty members or pursuing their own programs of research.”

Such research necessarily involves expenses, putting it out of reach for many students. Siegel hopes the research fund will increase the department’s capacity to support not only its students’ research, but also their travel to professional conferences to present their findings.

“The university has been very good to me and I felt it was important to give back,” says Siegel, who began teaching at UMass Lowell in 1968. In the early 1980s, he hired a promising young adjunct to teach a few psychology courses. Today that adjunct is chancellor of UMass Lowell. Siegel says his decision to endow the research fund was partly to honor Chancellor Jacque Moloney—and to inspire other faculty members to consider endowing their own funds.

Endowed funds will be a cornerstone of Our Legacy, Our Place: The Campaign for UMass Lowell, which will have its public launch later this month. Since FY 2011, the university has stewarded the creation of 181 new endowed funds, bringing the total number to 448 and the endowment total to $82.4 million.

Prof. Richard Siegel endowed a fund that will help psychology students conduct research.
Clarissa Eaton was 44 when she decided to finish the bachelor’s degree she’d begun half a lifetime ago.

She attended Boston University for three semesters before leaving at age 19 to buy a ballet studio in Littleton and get married. Seven years later, she was a single mom with two kids and two jobs: running L’Ecole de Ballet and teaching preschool. Since then, she’s added a third, a part-time job with the Thoreau Society.

Now 47, Eaton will graduate from UMass Lowell this May with double majors in English and psychology after three years of taking online and on-campus classes through the Division of Online and Continuing Education (OCE). She plans to go on to a Ph.D. program in English so she can teach college students one day.

“I have three jobs, two children and two majors,” she jokes. “I don’t sleep much.”

Eaton is one of thousands of nontraditional students in the division, which has seen its enrollments more than double since 2007. This spring the division topped 10,000 online course sign-ups for the first time: With another 2,300 enrollments in on-campus classes, that adds up to an 8.5 percent increase over spring 2015. Total course enrollments for the academic year, online and on-campus, are expected to meet or exceed 36,000.

OCE Co-directors Catherine Kendrick and Pauline Carroll say some of the division’s growth comes from traditional day students who take classes online to make up for time spent in a co-op or other job. Day students also take winter intersession and summer classes, which are run by the division. But most OCE students are “degree-completers” like Eaton, or older students with jobs and family responsibilities looking for professional advancement.

The division continually offers new online degrees that build on the campus’ strengths, including new graduate programs in cybersecurity, business analytics, health informatics, security studies, information technology and engineering management.

On-campus enrollments are growing, too, due to the opening of a satellite campus in Haverhill with Northern Essex Community College, customized workforce training programs and expanded international programs.

The success of the OCE is also due to its quality, for which Kendrick and Carroll credit Chancellor Jacqueline Moloney’s leadership.

Moloney introduced the first online classes 20 years ago when she was dean of continuing education, making UMass Lowell a pioneer in online learning. She also insisted that faculty undergo comprehensive training—not just in the technology, but in how to teach online classes effectively.

Over the past two decades, the university and individual faculty members have earned multiple national and international awards for online excellence. UMass Lowell is now ranked No. 39 for best online bachelor’s degrees by U.S. News & World Report—the second highest among all colleges, public or private, in New England—and No. 9 for online graduate education programs. It has similarly high rankings for its degrees in information technology, business and autism intervention.

All the OCE’s certificate and degree programs are tightly integrated with traditional university offerings, allowing students to progress from one degree to another or from online to on-campus without interruption.