



New Biomedical Engineering Program

State approves undergraduate degree

The University at Buffalo has obtained New York State Department of Education approval to offer its bachelor of science degree in biomedical engineering. The new academic program is a joint effort between the School of Engineering and Applied Sciences and the School of Medicine and Biomedical Sciences.

LUNCHED IN 2008 with a \$2 million grant from the John R. Oishei Foundation, UB's new Department of Biomedical

Engineering was created to support Western New York's robust medical device industry.

UB currently is raising an additional \$1 million to support initiatives within the new department and will receive an additional \$1 million from the Oishei Foundation upon doing so.

Interested students can apply now for fall enrollment in UB's undergraduate program in biomedical engineering. Proposals to establish new master's and doctoral programs in biomedical engineering at UB are expected to be submitted for State Education Department review and approval in the near future.

BY
ELLEN
GOLDBAUM

The new department complements three strategic strengths of UB

2020, the university's long-term strategic plan: Molecular Recognition and Bioinformatics, Health and Wellness Across the Life Span, and Integrated Nanostructured Systems.

The program is being offered at a time when the field of biomedical engineering is experiencing tremendous growth, notes Harvey G. Stenger Jr., dean of the engineering school.

"The biomedical engineering field is growing so fast that UB soon will be enrolling many new students and our faculty will be producing research that can be used immediately by local medical device companies," he says.

"Enrollment in this field is way up, nationally. There are four times as many biomedical engineering students in the nation today as there were just a decade ago, and demand for students possessing these skills is growing rapidly, locally and nationally."

Michael E. Cain, MD, dean of the School of Medicine and Biomedical Sciences, says: "The marriage between engineering and medicine is essential to translating basic discovery in engineering to improving human health and wellness. Our new department allows us to formalize and expand our expertise in biomedical engineering and positions UB to lead in this key area of health-related research.

"It is a vibrant and growing field," Cain continues. "In fact, one of our best

medical students was just awarded a nationally competitive fellowship in biomedical engineering to conduct research in improving vascular stents and vascular grafts."

Alexander N. Cartwright, PhD, chair of the Department of Electrical Engineering and the new chair of the Department of Biomedical Engineering, says there already has been tremendous interest from UB's student body.

The new department's 14 full-time faculty members were selected based on their current research funding in biomedical engineering. The initial faculty have dual appointments in biomedical engineering and their home departments, which range from medicine to electrical engineering.

"We are slated for growth," says Cartwright, who explains that four new full-time hires will be made in the next two years.

The first class is expected to graduate by 2012. Biomedical engineering students enroll in the general engineering curriculum for the first two years, and then take specialized courses in the department during their junior and senior years.

The department will work with local companies to develop opportunities to conduct joint research and senior design projects, which will be required of all biomedical engineering students, either working with faculty in a lab or in an industrial setting.

"We want to collaborate with local industry and ask for input from companies," says Cartwright. "It will be a win-win for the companies, our faculty and our students."

Current research projects in the department are focused on development of "smart" band-aids, which sense the wound microenvironment and release wound-healing compounds when needed; artificial skin that regenerates after severe burns; next-generation X-ray imaging systems; stem cells for treating diabetes and cardiovascular disease and batteries to power implantable biomedical devices.

For more information about biomedical engineering at UB, go to <http://www.bme.buffalo.edu/> or contact Cheryl Michalowski at (716) 645-8500.



"The marriage between engineering and medicine is essential to translating basic discovery in engineering to improving human health and wellness."

—MICHAEL E. CAIN, MD, DEAN

Ultimate in Hands-on Learning

ONE OF THE WORLD'S FIRST SIMULATORS to closely approximate the "touch and feel" of the da Vinci™ robotic surgical system has been developed through a collaboration between the Center for Robotic Surgery at Roswell Park Cancer Institute and the UB School of Engineering and Applied Sciences.

The most widely used system of its kind in the world, the da Vinci robotic surgical system affords all the features that an experienced surgeon needs to ensure equivalent or

superior outcomes to conventional surgery.

But such a surgical system, like an aircraft, "is only as good as the pilot, and the current training required for proficiency in robot-assisted surgery is unfortunately less than ideal," says Khurshid A. Guru, MD, director of the Center for Robotic Surgery and attending surgeon in RPCI's Department of Urology. "While surgical practice does make perfect, we believe that through better training tools, the early learning curve of robot-assisted surgery can be

New locally developed "Flight Simulator" for Robotic Surgery

BY
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shortened without jeopardizing the safety and welfare of patients."

The Robotic Surgical Simulator, or RoSS, addresses the quickly growing need for a realistic training environment for robot-assisted surgery, a field that is rapidly expanding and is expected to constitute a significant number of all surgeries within the next five to seven years. The RoSS will play a critical educational role for

RPCI and other similar institutions involved in robot-assisted surgical systems.

"Think of the RoSS as a flight simulator for surgeons," explains Thenkurussi ("Kesh") Kesavadas, PhD, professor of mechanical and aerospace engineering at UB and head of its Virtual Reality Lab, who, with Guru, invented the RoSS and founded the Western New York-based spin-off company Simulated Surgical Systems LLC, to commercialize the simulators.

Creation of the RoSS is an example of how UB and RPCI research can be commercialized and brought to the marketplace to benefit society.

"Our experience using computers to transmit accurately the real-time feel and touch of surgery has enabled us to work with Roswell Park to create a training system that provides a highly realistic simulation of robotic surgery."

THENKURUSSI ("KESH") KESAVADAS, PhD, PROFESSOR OF MECHANICAL AND AEROSPACE ENGINEERING

"Until now, surgeons have not had sufficient opportunities outside of the operating room to gain extensive training in robotic techniques," says Guru, whose own surgical expertise has made RPCI's robotics program a Center of Excellence and a world leader in physician training in robotics. Instead, he explains, surgeons

usually start by "shadowing" a colleague who is more experienced with robotics in the operating room; once they are seen as having developed some proficiency, they start doing robotic surgeries on their own patients.

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Ultimate in Hands-on Learning

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ALREADY, AT LEAST 70 PERCENT of all prostate surgeries in the U.S. are performed using robotic surgical systems (at RPCI, that percentage is closer to 100 percent both in prostate and bladder surgeries); robotic surgeries are generally less invasive, cause less pain, require shorter hospital stays and allow faster recoveries than conventional surgery. Robotic surgical systems are increasingly being used for gynecologic, gastrointestinal, cardiothoracic, pediatric and other urologic surgeries.

"The RoSS will have a major impact on improving surgical outcomes," says Donald L. Trump, MD, president and chief executive officer of RPCI. "The product's relevance will grow in direct proportion to the acceptance and application of robot-assisted surgery as a best practice around the world. The training that RoSS provides will eventually translate into better quality of life for thousands of patients."

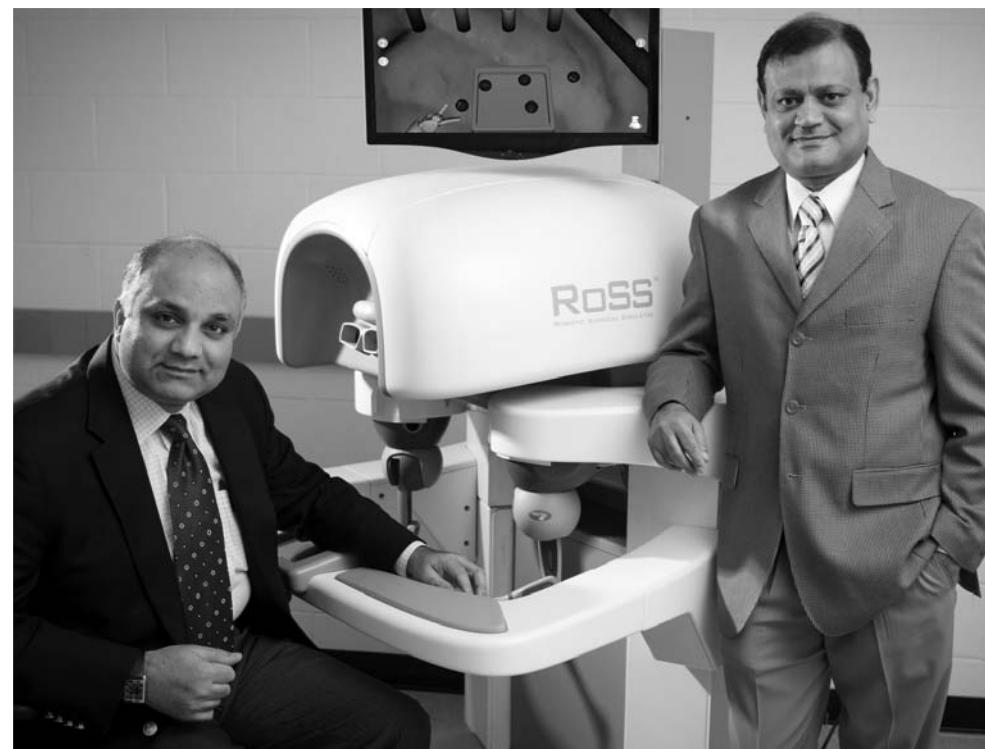
For more than a decade, UB's Virtual Reality Lab has been one of very few in the nation focused on developing haptic technologies—technologies that bring a sense of touch to virtual reality. "Our experience using computers to transmit accurately the real-time feel and touch of surgery has enabled us to work with Roswell Park to create a training system that provides a highly realistic simulation of robotic surgery," says Kesavadas.

"This is a true collaboration that started between two individuals with world-class skills in their respective areas," says Robert J. Genco, DDS, PhD, vice provost and director of UB's Office of Science, Technology and Economic Outreach (STOR), which assists in the commercialization of technologies developed by UB researchers.

"Hospitals don't invest in these multi-million-dollar robotic surgery systems so that people can train on them," says John Burgess, Simulated Surgical Systems LLC chief executive officer. "Their most pressing need has been a good training environment for robotic surgery."

The SUNY Research Foundation and Health

Research Inc., the technology transfer arm of Roswell Park, jointly licensed the RoSS technology to Simulated Surgical Systems LLC. The company, which employs several engineers who are highly skilled in developing virtual simulation software for surgical applications, plans to begin selling the RoSS by the end of 2010. 



The simulator, which was developed by Thenkurussi ("Kesh") Kesavadas of UB (right) and Khurshid Guru of Roswell Park, allows surgeons to practice skills needed to perform robot-assisted surgery without risk to patients.



MATCH DAY 2010

This year's Match Day festivities took place on March 18 at the Pearl Street Brewery in downtown Buffalo, where students, their families and faculty gathered to celebrate.

To view the Match Day results for our school, go to medicine.buffalo.edu/matchday.html.

PHOTOS BY NANCY J. PARISI



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1 Nicole Hans, left, will train in family medicine at Travis Air Force Base Medical Center in California, and James Chelnis, right, will complete preliminary training in medicine at Caritas Carney Hospital in Dorchester, MA, and then enter residency in ophthalmology at UB.

4 Michael Freitas, left, will train in internal medicine at UB, and Tanya Azarani will train in psychiatry at Einstein/Montefiore Medical Center in Bronx, NY.

2 Roommates and best friends Pamela Wendel, left, and Lesley Small, right, share the good news of their matches to New York Presbyterian Hospital/Weill Cornell Medical Center, where Wendel will train in anesthesiology and Small in pediatrics.

5 Vanessa Lewis celebrates with her boyfriend, Justin Redd. Lewis matched to Johns Hopkins University School of Medicine, where she will train in emergency medicine.

3 Jenny Shen celebrates with Christopher DeSimone (foreground) and Daniel DeSimone. Shen will train in internal medicine at the University of Rochester Strong Memorial Hospital. The DeSimone brothers matched to the Mayo Clinic College of Medicine to train in internal medicine.

6 James Martin Papparini, center, with his sister, Rita, left, and Harita Nyakonda, right. Papparini will train in the Aerospace Medicine Program at the University of Texas Medical Branch in Galveston, TX, in the hopes of becoming an astronaut, and Nyakonda, will train at Baylor College of Medicine in Houston, TX.



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1 LEFT TO RIGHT: David L. Dunn, MD, PhD, vice president for health sciences; Regina M. Benjamin, MD, MBA, surgeon general of the United States; Michael E. Cain, MD, dean, School of Medicine and Biomedical Science; and Nancy Nielsen, MD '76, PhD, senior associate dean for medical education **2** Karen Williams being hooded by Linda Pessar, MD, left, and Frank Schimpfhauser, PhD, right **3** Tri Dao being hooded by David Holmes, MD, and David Milling, MD **4** Seo Moon being hooded by Linda Pessar, MD, and Frank Schimpfhauser, PhD **5** Simon Fung-Kee-Fung celebrating **6** LEFT TO RIGHT: Zachary Kasperek, Shalana O'Brien-Labayen, Nadia Shaukat **7** Daniel Moring-Parris being hooded by Linda Pessar, MD, and Frank Schimpfhauser, PhD.



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2010 MEDICINE GRADUATION

The 164th commencement for the School of Medicine and Biomedical Sciences was held on April 30, 2010, at the Center for the Arts on the North Campus.

This year, the school conferred 129 MD degrees; 2 MD/PhD dual degrees; 4 MD/MBA dual degrees; and 2 MD/oral and maxillofacial surgery degrees.

The honored speaker was Regina M. Benjamin, MD, MBA, surgeon general of the United States Public Health Service.

PHOTOS BY NANCY J. PARISI



2010 BIOMEDICAL SCIENCES GRADUATION

The Undergraduate and Graduate Biomedical Sciences Commencement for the School of Medicine and Biomedical Sciences took place on May 6, 2010, at the Center for the Arts on the North Campus.

This year, 19 PhD, 28 master's and 242 baccalaureate candidates were eligible for degrees.

The commencement address was delivered by Susan Amara, PhD, Thomas P. Detre Professor and Chair of Neurobiology in the University of Pittsburgh's School of Medicine. Degrees were conferred by UB President John B. Simpson, PhD.

Candidates completed work in the following School of Medicine and Biomedical Science departments or programs: biochemistry, biochemical pharmacology, biotechnical and clinical laboratory sciences, microbiology and immunology, neurosciences, nuclear medicine technology, medical technology, pathology and anatomical sciences, pharmacology and toxicology, physiology and biophysics, and biomedical sciences. Also included were the Roswell Park Cancer Institute Graduate Division programs in biochemistry, cancer pathology and prevention, molecular pharmacology and cancer therapeutics, immunology, cellular and molecular biology, molecular and cellular biophysics and biochemistry, and natural sciences.

PHOTOS BY NANCY J. PARISI

