Pitt Alumnus Terrance Hayes Wins National Book Award for Poetry

University of Pittsburgh alumnus Terrance Hayes has been named a 2010 National Book Award winner for Lighthead (Penguin, 2010), his fourth collection of poetry.

A description of the book on the National Book Foundation Web site reads, “In his fourth collection, Terrance Hayes investigates how we construct experience. With one foot firmly grounded in the everyday and the other hovering in the air, his poems braid dream and reality into a poetry that is both dark and buoyant.... This innovative collection presents the light-headedness of a mind trying to pull against gravity and time. Fueled by an imagination that enlightens, delights, and ignites, Lighthead leaves us illuminated and scarred.”

Patricia E. Beeson, Pitt provost and senior vice chancellor, said “The University’s graduate programs in English are known for a long tradition of innovative leadership in their respective areas, including creative writing. I am delighted that the strength of the MFA program is being recognized again through this well-deserved acknowledgement of Terrance Hayes’ work.”


“Terrance Hayes’ other books of poetry are Wind in a Box (Penguin, 2006), which was named one of the best 100 books of 2006 by Publishers Weekly; Hip Logic (Penguin, 2002), winner of the 2001 National Poetry Series Open Competition and a finalist for the Los Angeles Times Book Award; and Muscular Music (Tia Chucha, 1999), winner of the Kate Tufts Discovery Award.”

By Patricia Lomando White

In this innovative collection presents the light-headedness of a mind trying to pull against gravity and time. Fueled by an imagination that enlightens, delights, and ignites, Lighthead leaves us illuminated and scarred.”

Patricia E. Beeson, Pitt provost and senior vice chancellor, said “The University’s graduate programs in English are known for a long tradition of innovative leadership in their respective areas, including creative writing. I am delighted that the strength of the MFA program is being recognized again through this well-deserved acknowledgement of Terrance Hayes’ work.”


“It’s so wonderful for him, the University, and the city,” said poet Toi Derricotte, Pitt award-winning professor of English who served on Hayes’ MFA committee. “He has always been a person determined to be a really great writer, and our MFA program is a place where you can learn to do that. We have a diverse group of professors, which enables writers like Terrance to try different kinds of work. He is a poet who takes risks.”

According to Derricotte, Hayes’ collection of poems is “a poetry that is both dark and buoyant.... This innovative collection presents the light-headedness of a mind trying to pull against gravity and time. Fueled by an imagination that enlightens, delights, and ignites, Lighthead leaves us illuminated and scarred.”

By Toi Derricotte

Terrance Hayes

The University of Pittsburgh launched its newly established Brackenridge Circle— comprising individuals whose planned gifts, pledges, and other contributions to the University total $1 million or more— with a Nov. 3 awards ceremony for the inaugural class of Brackenridge Circle donors in the Hall of Sculpture at the Carnegie Museum of Art.

Continued on page 2
New Society for Planned-Giving Donors Launched

The Nov. 3 launch of the Brackenridge Circle at the Carnegie Museum of Art will be performed at 8 p.m. Fridays and Saturdays and 5 p.m. Sundays. There will be one school matinee at 10 a.m. Dec. 10. Tickets are $20 general admission and $10 for senior citizens, students, and children. They can be purchased at the door or reserved by calling 412-648-2276.

By Sharon S. Blake

Nationality Rooms Holiday Open House to Be Held Dec. 5

The University of Pittsburgh’s 27 Nationality Rooms can be seen through open house from noon to 4 p.m. Dec. 5. The rooms, located on the Cathedral of Learning’s first and third floors, will be decorated in holiday splendor, displaying holiday customs from around the world. The rooms remain decorated until Jan. 14, and both toped and guided tours are available. On Saturdays—Dec. 4, 11, and 18—toped tours will be available from 9 a.m. to 2:30 p.m. On Sundays—Dec. 12 and 19—toped tours will be available from 11 a.m. to 2:30 p.m. Guided tours will be offered Dec. 27-31 beginning at 10:30 a.m., and the last tour will be departed at 2:30 p.m. Tours commence every half hour. Toped tours are unavailable during these times. Tickets can be purchased at the Gift Shop on the first floor of the Cathedral of Learning, reservations are not accepted. Admission is $3 for those 19 and older, and $1 for youths ages 8-18. Children under 8 are free. For more information, visit www.pitt.edu/natrooms or call 412-624-6000.

Pitt's Shona Sharif African Dance and Drum Ensemble Presents Nativity: A Christmas Gift

The Shona Sharif African Dance and Drum Ensemble, part of the University of Pittsburgh Department of African Studies, will present its musical production of Nativity: A Christmas Gift on weekends from Dec. 4 through Dec. 19 in the Seventh-Floor Auditorium of Alumni Hall. Imprinted by Long utan Hyggs’ Black Nativity, the show explores the Christmas season through traditional West African dance and 20th-century gospel music. Nativity: A Christmas Gift will be performed.

Continued from page 1

Pitt’s Department of Physics and Astronomy, he said. The majority of Oxford professor Roger Penrose developed the Newman-Penrose formalism, one of the most-cited sets of equations in relativity. In short, the formalism is an alternative method for describing Einstein’s equations that replaces Einstein’s own version, Newman explained.

The significance of the Newman-Penrose formalism is that it allows for special conditions to be imposed before one attempts to solve an equation—conditions for which Einstein’s original theory does not apply. Instead of using the four standard space-time coordinates, the Newman-Penrose equations use four different vectors to describe the geometric constructions of the theory that arise from massive objects in motion. “We knew we had something good,” Newman recalled. “We performed the Goldberg-Sachs theorem, which originally required a great deal of effort, at the drop of a hat. We knew it was a powerful technique, then. I’ve used it virtually every day since the original paper, and when I lecture now to a technical audience, I assume that most people are familiar with it.”

Three years later, in 1965, Newman inadvertently took part in constructing another important solution, the Kerr-Newman black hole. As a hotshot young physicist, Newman stated in the Journal of Mathematical Physics, a class of solutions to Einstein’s equations did not exist. In all of Newman’s mathematics, however, there was one lowly plus-sign that should have been a minus. Roy Kerr, then a professor of physics at the University of Texas at Austin, discovered the error and found that the class of solutions did in fact exist. But it turned out that the new, corrected equation easily allowed Newman to solve the Einstein-Maxwell equations for describing rotating, electrically charged black holes and their surrounding region. The Kerr-Newman stands as one of four solutions to Einstein’s equations describing black holes.

In his more recent work, Newman investigates null foliation, or the patterns light rays form as they fill space-time. In 1980, Newman first identified what became known as H-space that occurs at the outer reaches of light’s range when light rays no longer have physical contact—like the fingertips of a splayed hand. Newman is currently working on possible applications of this new theory for explaining spacial phenomena. [Also known as Heaven theory after a good-natured play on the “H” coined fittingly at a lecture Newman gave in Israel. The work gained notoriety after antiprop- spasmodic crusader Sen. William Proxmire (D-Wisconsin) took the name seriously and decreed Newman’s National Science Found-...
Transformational Research Through Modeling and Simulation

By Jeffrey Fraser

Pitt researchers tackle some of the most complex issues of our times in the University’s new Center for Simulation and Modeling. Infectious disease. Global warming. The world economy. These are vastly different subjects, yet all have some things in common. All are complex systems influenced by multiple external stimuli. All have intense importance for humanity, deciding who lives, who survives, and how they live. And our understanding of all three can be advanced through computer simulation.

Researchers at the University of Pittsburgh are building powerful models to simulate complex phenomena. Armed with these new models and aided by the help of more and increasingly powerful microprocessors, they are asking essential questions that would have been unthinkable to ask computationally as recently as 10 years ago. Pandemics, climate change, banking meltdowns—all can be described by algorithms, and all can be simulated with powerful computers.

A Giant Step Forward in Simulation and Modeling

This limitation is being addressed on a large scale at the University of Pittsburgh through the Center for Simulation and Modeling (SAM), a multidisciplinary research center established in Fall 2008, that works with Pitt researchers to develop new multiscale approaches for simulation and modeling. The center also helps foster collaborations across disciplines in modeling and simulation.
carbon dioxide (CO₂), and, as the polar region warms, the melting permafrost may release the remaining methane beneath it. Either way, understanding methane hydrate’s mysterious properties is crucial. Jordan works in partnership with the U.S. Department of Energy’s National Energy Technology Laboratory to simulate the structure and dynamics of methane hydrate. In hydrates, water molecules form polyhedral cages around methane molecules. Simulations allow Jordan’s team to explore questions about methane hydrate that would be nearly impossible otherwise. “On the computer, we can study the network of cages without the methane molecules—something that cannot be done experimentally,” he says.

Jordan’s group also is studying a hydrate that is formed from water and CO₂ molecules, which may be useful in sequestrating CO₂, the world’s most abundant greenhouse gas.

Like many researchers at the University, Jordan collaborates with experimentalists at numerous institutions, including Yale and Purdue universities, to combine his computational approach with experiments at numerous institutions, including Yale and Purdue universities.

Carbon dioxide also is an area of inquiry for Johnson, who is using computational modeling to understand how CO₂ interacts with many other materials. Johnson and his collaborators are hoping that the materials they help to design will one day be used to capture CO₂ and slow global climate change.

“Air from 20 to 50 years, we’re going to be relying heavily on fossil fuels for energy,” Johnson says. “How can we use that resource without releasing CO₂ into the atmosphere?” Johnson’s group is modeling a class of nanoporous material compounds with “poles” 1/000th the width of a human hair in diameter to understand how they interact with CO₂. He hopes their modeling will lead to the design of a material that can capture CO₂ from power-plant emissions. The captured CO₂ could then be stored through carbon sequestration.

Modeling is helping one Pitt researcher to tackle another aspect of the energy challenge: how to make solar power more accessible. Geoffrey Hutchison, assistant professor of chemistry, uses computational modeling to study a class of conductive plastics called polythiophenes. These materials can be used as photovoltaics and could become a cheaper alternative to silicon-based solar cells. Just as intriguing to Hutchison is that polythiophenes can be processed like inks. “You could paint this on the roof of every car and every building and have solar cells in all these places,” Hutchison says.

Hutchison is experimenting with these plastics on the computer, simulating conductive properties of different molecules. “We can look at what happens if we change, say, a carbon atom into a nitrogen—you can do that on a computer, and do that experimentally would take months.” Hutchison and his collaborators put together a group of 100 potential molecules and, through simulations, gleaned five or six that could be good candidates for solar cells. “A lot of these molecules look like things we could make, but we want to understand whether to put in the effort to make them,” he says.

Laura Schaefer, a professor of mechanical engineering and materials science at the Bicentennial Board of Visitors Faculty Fellow, and deputy director of the Mascaro Center for Sustainable Innovation at Pitt, uses computer modeling to develop green alternatives to chlorofluorocarbons (CFCs) and related polymers. CFCs have long been used as refrigerants in air conditioning because their chemical profile allows them to draw away heat from the air around them efficiently and safely. But CFCs deplete the Earth’s ozone layer, which blocks harmful solar radiation, and these chemicals will be phased out completely this year.

Hydrochlorofluorocarbons (HCFCs), the chemicals used to replace CFCs, are more environmentally friendly but still have a negative impact on the ozone layer. Regulators also will begin phasing out the most common HCFCs this year.

Schaefer, who also has used computer modeling to study the use of acoustics for refrigeration, is simulating how different combinations of chemicals would react to find a safe, efficient alternative. Her work involves multiscale modeling that predicts how the system as a whole will perform. The urgency to develop a safer, more energy-efficient refrigerant is great; air conditioning accounts for one-sixth of U.S. household electricity use. Schaefer’s work is leading to new understandings in the basic science of fluid dynamics, she says. “The theoretical insights have been really fascinating. We’re learning a lot on how complex fluids behave at a small level. This could have far-reaching impacts for researchers in other fields.”

Tracking Global Health

Computer modeling tools have become increasingly important to understanding and addressing global health problems. By using informatics and computational modeling and simulation, researchers and policymakers can understand more about current public health challenges and determine the best strategies to prevent disease and improve human health.

Modeling also can show how disease spreads through whole populations, as demonstrated by the work of Donald Burke, GSPH dean, UPMC-Jonas Salk Chair of Global Health, and associate vice chancellor for Sustainable Innovation at Pitt. Burke is a pioneer in using computer modeling to understand the behavior of pandemic disease.

For decades, Burke tracked infectious diseases like HIV/AIDS and dengue fever throughout the developing world. In the 1990s, he began to think of pandemics as complex processes—“I now think of virus transmission as an algorithmic process,” Burks says. “I never would have thought that way before I started to use computer modeling and simulation.”

The computer model Burke and his collaborators designed to simulate an outbreak of avian flu in Southeast Asia—using transmission statistics from past epidemics, census data, and other social patterns—has helped the U.S. Department of Health and Human Services, U.S. Department of Homeland Security, and the Centers for Disease Control and Prevention develop policies on travel restrictions, vaccinations, and school closures in the event of an outbreak. The Bill & Melinda Gates Foundation, which funds projects to help eradicate infectious disease, committed $10 million to Burke’s group to build a model for the use of vaccines to contain epidemic diseases.

“Computer modeling allows us to test in silicon our ideas on populations,” says Burke, and not just for epidemics of infectious diseases. Smoking, obesity, and drug use are all examples of public health problems where social behaviors spread from person to person in a fashion similar to contagious microbes and where modeling can help people think through and evaluate public policies designed to limit or reverse the spread of the behaviors, according to Burke. Pitt can be an international leader in this exciting new field, he says: “We’re definitely on the front edge. My intuition is that soon, virtually every aspect of public health research and policy development will be supported by modeling and simulation, and Pitt is extremely well positioned to lead the field.”

In 2009, the University was designated a MIDAS (Models of Infectious Disease Agent Study) National Center of Excellence, sponsored by the National Institutes of Health. Burke and his MIDAS team have added expertise in computational modeling and simulation to study the spread and impact of infectious diseases around the world. Burke and Bruce Lee, an assistant professor in GSPH and a core member of the recently founded Public Health Dynamics Laboratory, examine a map showing the spread of influenza throughout the U.S.
As part of the Bill & Melinda Gates Foundation-funded Vaccine Modeling Initiative, researchers in Pitt’s Graduate School of Public Health are developing computer models of disease spread and vaccine distribution. The above graphic shows the spread of measles throughout Nigeria, with colors changing from blue to green to red, representing increasing numbers of measles cases.

Spotlight on Research

**Designing Materials and Nanotechnology**

Just as Givi’s models depict how engines will work before they are built, computer modeling allows researchers to test the properties of new materials and novel chemical compounds prior to their being built.

“If you can understand what’s happening at the level of atoms, you can build things from the bottom up and create designer materials,” says Johnson. His lab is using models to probe the physical properties of carbon nanotubes—long, straw-like molecules with very narrow diameters that scientists think may be useful for separating different gases or liquids. For example, a carbon nanotube membrane that selectively separates water from sodium chloride could be used as an easy, low-energy way to desalinate seawater.

Johnson and his group model how specific mixtures of molecules interact with these structures, showing, for instance, how quickly these materials flow through the nanotubes. Unless the flow rate is fast, the membrane will not be useful in practical terms for separating fluids. The model created by Johnson and his collaborators found that gases would pass much more quickly through the nanotubes than expected. Johnson, who was published in a 2006 Science article by a separate research team supported some of the predictions Johnson’s team had made. He measured the flow rate of gases and liquids was about 1,000 times faster through the nanotubes than through conventional porous membranes.

Johnson is using modeling to study one of the most abundant materials on Earth: water. “Although water is probably the most studied substance on Earth, we still don’t understand all of its properties, many of which aren’t understood,” Jordan says.

Jordan’s group simulates the behavior of small clusters of water containing up to 100 molecules. These studies are shedding light on a wide range of processes, among them chemical reactions in the atmosphere and electrochemistry. One of the most important problems on which Jordan’s group is working is whether charged particles, such as electrons and protons, prefer to be on the surface or in the interior of water clusters. This fundamental science question turns out to have far-reaching consequences, including those of environmental importance in atmospheric chemistry.

One researcher is using computers to model “sticky stuff”—several or very fine granular material. Joseph McCarthy, a professor and William Keck Foundation Faculty Fellow in the Department of Chemical and Petroleum Engineering, studies the science of mixing sticky materials. This is an important process in fields like pharmaceuticals, where a thimbleful of active chemicals must be mixed into a roomful of inactive substance. McCarthy and his collaborators build intricate models to see how best to mix these materials based on their size, density, and ability to be attracted to or repelled by water. They calculate the behavior and mechanics of billions of particles interacting over hundreds of thousands of time segments. This takes months to run across several high-powered processors. The time put into these models saves McCarthy and his colleagues from having to build time-consuming physical experiments.

The McCarthy group simulated a “chute flow” experiment, in which a substance is poured down a surface with a series of zigzags built into its slope. In the physical experiment, the team would have had to build a chute as high as 12-story Benedum Hall, which houses the Swanson School of Engineering. “We can make a lot of measurements you can’t do when you’re working experimentally,” McCarthy says.

Computer modeling is allowing Anna Balazs, Distinguished Professor of Chemical Engineering and Robert von der Luft Professor, to explore the chaotic machines that behave in much the same way human cells do.

Balazs uses simulations to study how microparticles—synthetic bubbles roughly the size of a human blood cell—move across a surface could form an artificial “skin” on a damaged material. She also has simulated communication between these synthetic bubbles using a receiver similar to that used in processes occurring in cell signaling. These materials one day could form the basis for bionic sensors that “heal” defective surfaces.

“This artificial skin is essentially a coating that could indicate where a surface has been damaged,” she says. She believes that her simulations will help experimentalists to follow the “recipe” for the nanomachines her team has created using computational modeling.

Unlocking the Body’s Mysteries

Modeling is becoming an invaluable tool for many Pitt researchers in medicine and biology. From studying proteins at the atomic level to focusing on the body’s immune system, models let these University researchers quickly test theories—enabling innovations that could help save many lives down the road.

Lillian Chong, Pitt assistant professor of chemistry, uses computer simulations to study proteins, the body’s workhorses, in order to understand better the roles they play in the biological pathways of the cell. Chong studies natively unfolded proteins—so named for their seemingly disordered structure—which include a protein called tumor suppressor p53, thought to play a role in cancer. Proteins initiate important chemical functions in the body by “folding” into target molecules.

Chong’s group simulates the kinetics of these protein interactions on tiny time intervals of fem- toseconds (one quadrillionth of a second). “There’s no way you could get that level of time detail without a computer,” Chong says.

These studies led to the finding that a folding home, a unique collaboration based at Stanford University in which scientists use their computers to look for new uses of idle computers around the world. They can run protein-folding simulations on a network of more than 600,000 idle personal computers and Sony PlayStation 3s.

The Center for Simulation and Modeling at Pitt has received attention for its novel way of combining two modeling methods to provide an accurate way for engineers to experiment with engines even before they are built. Rolls-Royce and NASA engineers already use Givi’s model to predict temperature differential, fuel usage, and emissions for different engine and fuel combinations. Givi’s models plot billions of fluid particles across hundreds of thousands of time intervals. “It’s a lot of work, but it saves countless amounts of time and energy for engineers trying to create more efficient, cleaner-burning engines,” Chong says.

“With modern engines, you’d like to be able to know how it will work before you build it,” Givi says. “Computer simulation allows people to do that.”

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In collaboration with the Drug Discovery Institute, Bahar’s lab members screen libraries of hundreds of thousands of chemical compounds for their potential to interact with target proteins in the search to identify promising drugs for further development.

By doing “virtual screening,” Bahar says, she and her collaborators can not only increase the likelihood of identifying more potent inhibitors but also speed up the process of drug discovery.

“Through computational models, Ivet Bahar and her colleagues in Pitt’s School of Medicine simulate the interactions of proteins with potential inhibitors, small compounds that can limit the undesirable activities of some proteins. In collaboration with the Drug Discovery Institute, Bahar’s lab members screen libraries of hundreds of thousands of chemical compounds for their potential to interact with target proteins in the search to identify promising drugs for further development.”

Lillian Chang, Pitt assistant professor of chemistry, uses computer simulations to study proteins, the body’s workhorses, in order to understand better the roles they play in the biological pathways of the cell. Chang’s group simulates the kinetics of these protein interactions on tiny time intervals of femtoseconds (one quadrillionth of a second). “There’s no way you could get that level of time detail without a computer,” Chang says.
Highmark Presents Chris Botti, 4400 Forbes Ave., Oakland, Carnegie
Nov. 29,
Beethoven, Shostakovich, and Schubert,
performing Pacifica Quartet,
Concerts
folk music performers, noon
Eve Goodman and John Caldwell,
affiliates; tickets sold out for all other
5:15 p.m.
free, Pitt ARTS' Artful Wednesdays,
Place, Lower Level, William Pitt Union,
flamenco guitarist, noon
encyclopedia.org.
Happenings
Pitt Music Department Offers
Center for Latin American Studies,
Department of Hispanic Languages and Literatures, www.amigocineticoamerican@gmail.com.
Pitt Nationality Rooms' Holiday
Open House, Cathedral of Learning Common Rooms.
27 Nationality Rooms are decorated in holiday splendor, noon-4
p.m. Dec. 5,
Pitt's Center for Polish Literature and Culture, 118 Landmark Center.
Pitt Opera/职权
Dance
The Last Days of Judas Iscariot
by Stephen Adly Guirgis, Pitt Repertory Theatre's student lab theatrical performance.
Dec. 3-5, Studio Theatre, Cathedral of Learning, Pitt Repertory Theatre, Downtown, University of Pittsburgh,
The Morin Strud by Willy Holtzman,
included by true that incised the classical music world
through Dec. 12, City Theater, 1308 Bingham St., South Side, 412-346-2449,
www.citytheatrecOMPANY.com.
Talley's Folly, Pulitzer Prize-winning romantic comedy by Lanford Wilson,
PITT ARTS Cheap Seats, 412-649-4498,
www.pittarts.pitt.edu.

Marilyn Monroe: Life as a Legend,
252 Cathedral of Learning, Pitt School of History and Physical Activity, 12:05 p.m.
Dec. 3, University Center postdoctoral fellow, 9 a.m.
worldhistory.pitt.edu.
Teaching World History Since 1980: A Collection of Lectures and Essays by Andre Gourley,
Frick Fine Arts Auditorium,
Gutiérrez Alea), 6:30 p.m.

Highmark Presents Chris Botti, 4400 Forbes Ave., Oakland, Carnegie
Music Hall Chamber Series, Pittsburgh Chamber Music Society, 412-624-4129,
Highmark Presents Chris Botti, Catholic Church, Iron City. 10 a.m.
Renaissance City Choirs Holiday Concert,
Frick Fine Arts Building, William Pitt Union Ballroom, free, Pitt Women's Studies Program, 2-6 p.m.
African Music and Dance Ensemble,
Heinz Hall, Asia Over Lunch Lecture Series, 12:05 p.m.
Dec. 3, University Center postdoctoral fellow, 9 a.m.
worldhistory.pitt.edu.

Exhibitions

Highmark Presents Chris Botti, Heinz Hall, November 30
Concerts
Pacific Quartet, performing Beethoven, Shostakovich, and Schubert,
Highmark Presents Chris Botti, Grammy-nominated trumpeter, 7:30 p.m.
Nov. 30, Heinz Hall, 600 Penn Ave., Downtown, Heinz Hall Special Presentation,
Pitt Men's Glee Club Holiday Concert,
8 p.m. Dec. 3, First Baptist Church of Pittsburgh, 304 N. Belfield Ave., Oakland, free to Pitt students with ID, tickets must be reserved in advance, Pitt Department of Music, 412-624-4125, www.music.pitt.edu.
Renaissance City Choirs Holiday Concert, Pittsburgh's gay and lesbian music ensemble, performing traditional carols and featuring the Edgewood Symphony Orchestra, 9 a.m. Dec. 11, Carnegie Music Hall, Oakland, tickets available by calling 412-362-8944, or online at www.rccpsburgh.org.

Exhibitions
Frick Art and Historical Center, For My Best Regional Sister, An Album of Photographs by Julia Margaret Cameron, works by one of the Victorian Era's best-known master photographers, through Jan. 3, 227 Reynolds St., Point Breeze, 412-371-0600, www.frickart.org.
Lectures/Seminars/Readings
“What Becomes of Tristan and Yseult in the Renaissance?” Jane Taylor, University of York, UK, 4:30 p.m. Nov. 30, 225 Cathedral of Learning, Pitt School of History and Physical Activity, 12:05 p.m.
Dec. 3, University Center postdoctoral fellow, 9 a.m.
worldhistory.pitt.edu.
"Governmental Instruments of War: The Art ofInternational Relations," Thomas Anderson, Pitt's Pitt Center for Philosophy of Science, 412-624-1052, pittcenter@pitt.edu.
“The Lake Has No Saint,” Stacey Waite, teaching fellow, Pitt Women's Studies Program, 5:30 p.m.
Sheilie Rose, School of Arts and Sciences' Department of History and Anthropology, 2-6 p.m. Dec. 4, 4065 Forbes Tower, "Do More Than Give," Pitt's Center for Social Responsibility, 5:30 p.m.
Debra N. Thompson, School of Nursing, noon Dec. 5, Pitt National Multi-Level Study of Nurse Leaders, Safety Climate, and Care Outcomes, "219 Victoria Building."
Pamela E. Toto, School of Health and Rehabilitation Sciences, 9 a.m. Nov. 30, "Impact of Motivating Phrases and Physical Activity Program for Sedentary, "Dwelling Older Adults," 4065 Forbes Tower.
What Factors Contribute to the Success or Failure of Software Firms?

Pitt, McGill University, and Georgia Institute of Technology researchers find that it takes more than a good idea to succeed

By Amanda Leff Ritchie

Throughout the 1990s and 2000s, news about 20-somethings becoming billionaires from the sale of their software companies flooded the media, giving the impression that a good idea was all it took to succeed in the software industry. Jennifer Shang, a professor of business management in Pitt’s Joseph M. Katz Graduate School of Business, along with colleagues Shanling Li of McGill University and Sandra Slaughter of the Georgia Institute of Technology, investigated what caused software companies to succeed or fail. Their research study, titled “Why Do Software Firms Fail? Capabilities, Competitive Actions, and Firm Survival in the Software Industry From 1995 to 2007,” has been published in the journal Information Systems Research.

Because of low entry and exit barriers and low marginal-production cost, new-product development takes place rapidly in the software industry, says Pitt’s Jennifer Shang. However, the industry’s bankruptcy rate of 15.9 percent is much higher than the rates in other industries.

Shang and her colleagues examined software-company data collected between 1995 and 2007 from 870 firms. The collaborators looked at three aspects of internal business capabilities—marketing, operating, and research and development. They also examined two types of competitive actions: those that were innovation-related (product and marketing actions) and those that were resource-related (capacity and scale expansion, operations, service, mergers, and acquisition). They found that a higher operating capability has the greatest influence on a software firm’s chance of survival. Firms with a greater emphasis on innovation-related competitive actions have a greater likelihood of survival, and this likelihood increases when the firms also have higher marketing and operating abilities.

The researchers divided the software industry into three subsections: sector one, which included desktop suites and other business-enabling software; sector two, which included video games and graphics software; and sector three, which included operating systems and security programs. Depending on their sectors, software businesses need a slightly different approach to investments, says Shang. Firms producing games, for example, must emphasize marketing, whereas companies making products with a long life cycle (such as operating systems) must focus on operating abilities and research and development. Traditional software companies, those producing desktop applications, should follow a strategy somewhere between these two approaches.

“Our research underscores the importance of operating capability in the software industry,” says Shang. “Managers of knowledge-based firms often emphasize big ideas (innovation). Our study shows that operational efficiency is even more important for firm survival. Also, competitive strategies and dynamic actions will have more impact if they are supported by strong capabilities. In short, to improve performance and competitiveness, software companies should focus on synergies between firm capabilities and strategic actions.”

Because of low entry and exit barriers and low marginal-production cost, new-product development takes place rapidly in the software industry, says Pitt’s Jennifer Shang. However, the industry’s bankruptcy rate of 15.9 percent is much higher than the rates in other industries.

PUBLICATION NOTICE: The next edition of Pitt Chronicle will be published Dec. 6. Items for publication in the newspaper’s Happenings calendar (see page 7) should be received at least two weeks prior to the event date. Happenings items should include the following information: title of the event, name and title of speaker(s), date, time, location, sponsor(s), and a phone number and Web site for additional information. Items may be e-mailed to chron@pitt.edu, faxed to 412-624-4895, or sent by campus mail to 422 Craig Hall. For more information, call 412-624-1033 or e-mail robnet@pitt.edu.