WiNSeC: Wireless Network Security Center Researches Safe Communications

Force Protection at the Center for Maritime Systems

Stevens Named a University Partner to the Homeland Security Institute

ASME Celebrates 125 Years at Stevens

Exploring Innovations in Design, Fabrication, and Advanced Digital Media
ENGINEERING THE SECURITY OF AMERICA

is a topic of high priority within the Charles V. Schaefer, J r. School of Engineering. Our students and faculty are dedicating their energy and ingenuity to protecting our future.

Dear Friends and Colleagues,

I hope this issue of SSoE InFocus finds you well. Once more, the academic and research community is called upon to engineer solutions to a national problem. President Bush’s statement that, “We will build a national research and development enterprise for Homeland Security sufficient to mitigate the risk posed by modern terrorism,” makes it clear that science and technology will play a key role in protecting the nation from conventional and non-conventional threats.

In response, our faculty launched targeted research programs focused on key elements of Homeland Protection and Security. The following are only a few of the vital research programs currently under way at Stevens.

The interdisciplinary Wireless Network Security Center is producing break-through solutions that protect our wireless communication systems and networks from malicious attacks. Operating in one of the world’s highest “signal traffic” zones, WINSeC’s laboratories and testbeds are used to develop and test new technology for real-time, real-world security solutions.

In parallel, uniquely situated next to one of the world’s largest ports, the Center for Maritime Systems is performing groundbreaking research on threat detection and mitigation that will make our ports more secure. Their access to the New York - New Jersey Harbor affords them the ideal testing environment for innovative practical solutions that have immediate application to the needs of our nation.

Stevens’ faculty members are also working on developing the next generation of ultra-sensitive chem-bio detectors that achieve a quantum leap in detection capability over existing technology. Furthermore, intelligent sensor networks that can be deployed in the most difficult environments providing information to first responders with minimum latency are being developed and deployed by researchers in the Design and Manufacturing Institute.

All this research activity has provided an environment of excitement, critical thinking, and innovation for our undergraduate students. They are working on several security-driven senior design projects addressing issues of threat detection, information analysis, autonomous intervention systems, and biometric technology.

Engineering the security of America is a topic of high priority within the Charles V. Schaefer, J r. School of Engineering. Our students and faculty are dedicating their energy and ingenuity to protecting our future.

As always, I look forward to your input and participation.

Best wishes for the New Year.

Sincerely,

George P. Korfiatis
FEATURES

WiNSeC:
Wireless Network Security Center
Researches Safe Communications

FORCE PROTECTION
at the Center for Maritime Systems

Stevens Named a University Partner to the
Homeland Security Institute

INFOCUS

SSoE Students
Senior Design
Stevens Hosts West Point Cadets
Stevens Photography Club: Creative Engineers
New Undergraduate Concentrations

SSoE Heritage
Warren G. Wells ’42
Grounded in Tradition with an Eye to the Future
ASME Celebrates 125 Years at Stevens

New Graduate Program
Exploring Innovations in Design, Fabrication,
and Advanced Digital Media

SSoE Faculty
Generating IP: Recent Faculty Patents
Forging Dynamic New Partnerships in Systems Engineering
New Arrivals
Faculty News
Founded in 2002, WiNSeC is located in the heart of the New York-New Jersey metropolitan area. The center is focused on solving technical and organizational problems associated with secure communications platforms. Wireless technologies developed and tested by the center are certified to perform in even the most demanding situations. The center has successfully partnered with government agencies, academic institutions, and industrial groups across America to obtain research funding and pursue technology development.

Today, under the leadership of the Vice President for Institute Technology Initiatives, Dr. Helena S. Wisniewski (interim Director of WiNSeC); WiNSeC Deputy Director, Professor Bruce McNair; and WiNSeC Associate Director for Business Development, Dr. Patrick E. White, the center continues to expand upon its acclaimed research in a variety of Homeland Security applications for secure wireless communications and networking. Among the recent and ongoing research projects, there is a strong multidisciplinary, collaborative flavor.

The Howe School's Distinguished Associate Professor of Telecommunications Management, Kevin Ryan, has teamed with colleagues from Bell Labs-Lucent in a WiNSeC-sponsored project to study the implications of "dynamic spectrum assignment."

"The problem we're looking at," says Ryan, "is that some individuals and organizations license huge blocks of the communications spectrum, but use only a small fraction of that capacity. Given that the available spectrum is a precious and dwindling resource, we're studying better ways to manage the sharing of access to the spectrum – Coordinated Dynamic Spectrum Access, we call it. The FCC and others are interested to know whether a logical system can be devised in which one can temporarily access or 'lease out' for emergency communications especially, a portion of that unused licensed spectrum – and how to do it efficiently and equitably."

The Schaefer School's Department of Electrical and Computer Engineering (ECE) has had a large role in projects for WiNSeC, including research conducted by Assistant Professor K.P. Subbalakshmi and Assistant Professor R. Chandramouli who operate a lab to study issues of "steganography" and "steganalysis" - the science and art of hiding digitized information in other digital media for secure transmission over possibly insecure networks; the two professors also study how to extract the embedded media,
or if the media is malignant, how to destroy it without obliterating the host medium. Subbalakshmi's study for WiNSeC has been in the area of lightweight, error-resilient cryptography.

WiNSeC’s Patrick White has teamed with ECE Assistant Professor Cristina Comaniciu and Associate Professor Yu-Dong Yao, along with WiNSeC research associate Nicolas Girard, to pursue a major National Science Foundation grant investigating the design and implications of advanced mobile radios that can intelligently and automatically form simultaneous associations with multiple wireless networks. This project has implications for the battlefield and the home front. For example, end-users could instantaneously create a broadband channel by aggregating the capacities of multiple wireless networks. Police officers could up/download critical situation awareness data while responding to incidents, increasing their efficiency. Furthermore, the load-sharing network design increases the reliability of wireless communications to levels comparable with land-line networks. Professors from the School of Science and Arts’ Department of Computer Science (CS) are heavily involved in WiNSeC activities. Associate Professor Rebecca Wright and Assistant Professor Susanne Wetzel are both involved in wireless network studies funded through the center by agencies of the US military. Wright’s research involves data mining technology that preserves the privacy rights of non-suspects whose information happens to reside in databases of interest to law-enforcement and other legal authorities. Wetzel studies network architecture and protocol design, recently concluding a project that uncovered a vulnerability in ad-hoc Wi-Fi networks, and suggesting how to foil hackers who attempt to exploit it.

CS Assistant Professor Elli Angelopoulou and Associate Professor George Kamberov, who direct labs in computer vision and visualization, jointly worked on a project for WiNSeC that investigated the properties of large networks of computerized agents and sensors.

“During the Republican National Convention in New York last summer,” says Dr. Wisniewski, “WiNSeC performed a vital service to the nation, setting up a wireless communications back-up link in the local region to maintain emergency communications for New York in the event of an attack or other disaster...”

In August 2004, President Raveché announced the appointment of Dr. Helena S. Wisniewski to the position of Vice President for Institute Technology Initiatives. Dr. Wisniewski, a distinguished Stevens’ alumna, is responsible for the complete Technogenesis® cycle at the Institute including: the protection of intellectual property, encouragement of new and innovative partnerships, creation of new companies and their marketplace strategies, overseeing business services that support research and the international aspects of technology development, and student/faculty Technogenesis programs. Her overall goal is to ensure that Stevens is recognized as a national resource sought after by government and industry for its extraordinary research, technology, and entrepreneurial vision.

Wisniewski has received awards from government, industry, and organizations for her significant contributions to science, technology, and leadership. She held leadership positions as a Corporate Director at Lockheed (now Lockheed Martin) and Vice Presidencies at Titan and ANSER. She was founding director of the applied mathematics program at the Defense Advanced Research Projects Agency (DARPA), and served in a key position at the CIA. She has extensive experience in academia and serves as a Trustee.

Consistent with Stevens’ process of Technogenesis, she founded Aurora Biometrics, Inc., a provider of complete biometrics systems. The company’s suite of products was based on advances in mathematical modeling that she developed and patented. As its Chairman and CEO, she secured investment capital, developed the business, and sold the company, completing the process of innovation to implementation.

She earned her Ph.D. in mathematics from City University of New York, her Master of Science degree in Mathematics from Stevens Institute of Technology, and her bachelor’s in mathematics from William Paterson University (Distinguished Alumni - 2000).
Wisniewski's words echo throughout the WiNSeC... continued

back-up link in the local region to maintain emergency communications for New York in the event of an attack or other disaster within the city's boundaries. This link remains available for emergency first responders in the local New York City-New Jersey area."

“This center is an important element in Stevens’ arsenal of expertise, working to solve problems of critical importance to the scientific community, the government and military, and to the people of the United States of America.”

Among the many communications security projects accomplished or in progress at WiNSeC:

• Beginning in Feb. 2004, the center joined in a one-year, $11.5 million consortium project led by Lucent that is researching, developing, and demonstrating an ultra-high capacity, highly-secure communications system for DARPA’s Mobile Networked Multiple-Input, Multiple-Output (MIMO) program, also known as MNM. MIMO is a communications technique that uses multiple antennas to send and receive wireless signals at ultra-high speeds.

• WiNSeC has been awarded four out of four National Science Foundation grants. One award of $800,000 was for a wireless networking research grant to a consortium led by WiNSeC, the University of Colorado at Boulder, and Vanu, Inc. Another NSF grant supported development of a testbed that combines advanced networking and wireless communication technologies. The testbed enabled research on systems where mobile devices are simultaneously connected to multiple wireless networks and use flexible software radios to improve quality of service, security, and performance.

"This center," said Dr. Wisniewski, "is an important element in Stevens’ arsenal of expertise, working to solve problems of critical importance to the scientific community, the government and military, and to the people of the United States of America. Stevens, working together with its research partners, can devise innovative technology for more effective and affordable security, for the defense of our country. WiNSeC is truly a vital national asset."

Patrick A. Berzinski is Director of University Communications at Stevens.

Professor Bruce McNair Deputy Director at WiNSeC

McNair’s duties at WiNSeC include program management of funded projects within the center; personnel management and mentoring of junior research staff; assisting the WiNSeC director in staff planning and new staff acquisitions; business development of projects; and day-to-day interactions with faculty participating in WiNSeC projects.

"Bruce is a tremendous asset to our work at WiNSeC," said Dean Korfiatis. "The breadth of his experience in communications systems engineering is a perfect fit with the center’s mission." McNair is an Industry Professor in the Department of Electrical and Computer Engineering with more than 30 years experience in engineering research, design, development, and systems engineering in communications systems including wireless communications and system/network security. His research interests include high-speed wireless data networking, real-time digital signal processing, and software-defined radio technology. He serves as Chief Technical Officer of Novidesic Communications LLC in Holmdel, N.J. His other industry experience includes more than two decades of service at AT&T/Bell Labs. McNair holds both a Bachelor’s and a Master’s degree of Engineering from Stevens.

WiNSeC Associate Director Dr. Patrick White

In early 2003, Dr. Patrick White was named Associate Director of WiNSeC. He oversees the growing number of research efforts to strengthen the resilience of America’s communications networks against terrorism and other threats.

White is a veteran executive with 30 years communications experience spanning R&D, business development, strategic planning and venture investing. He was chief technologist for the Communications Group at Safeguard Sciences, Inc., and was on the Board of Directors of SOTAS, Inc. He was also a high-level technology officer at Extant, Inc., Arthur D. Little, Bell Atlantic, Bellcore (now Telcordia) and Bell Labs. At Bellcore, his team co-developed with France Telecom the ATM protocol now used by telecommunications carriers worldwide.

White holds a doctoral degree in Electrical and Computer Engineering from Northwestern University. He is a past member of the FCC Technology Advisory Council.

WiNSeC’s Optical Beam

A cornerstone of heightened homeland security is secure communications, and a Canobeam optical beam transceiver from Canon USA has been a big help in WiNSeC’s efforts. Researchers are conducting fundamental studies in the propagation of free-space optical signals at various wave lengths, through a variety of atmospheric conditions including fog, smoke, haze and dust. Initial prototypes of long wavelength infrared detectors have been developed to capitalize on the increased propagation inherent in longer wavelength infrared.

The Canon unit is set on the roof at Stevens’ Burchard Building, and is used to assess the usefulness of many communications systems, both for the battlefield and on the home front. "What we're doing at WiNSeC is balancing out all aspects of communications technology to provide research on connectivity," says WiNSeC Network Engineer Jason Evans. "We examine how Canobeam and other systems augment military and homeland communications systems, and how these networks deal with transitioning from one to another."
FORCE PROTECTION at the Center for Maritime Systems

Since October 12, 2000, when terrorists used a small fishing boat to incapacitate and nearly sink a high-tech missile destroyer worth hundreds of millions of dollars, 'force protection' has become a major focus for the US Navy. The attack on the USS Cole made it painfully obvious that deadly threats can come in small, low-tech packages, and that there was a dearth of measures that the Navy could rely upon to provide security for its fleet.

A group of researchers at Stevens' Center for Maritime Systems (CMS) has begun a joint project with the Office of Naval Research that will develop technology to identify and track small vessels and predict whether such vessels represent a threat.

It may sound simple, but identifying and classifying small ships in ports and offshore areas is anything but easy. In a busy port environment, standard radar proves to be of no use for small vessel detection. CMS Director Dr. Michael Bruno said, "We are looking at a range of technologies that will help us recognize small vessels, but the next question is how to identify whether any particular vessel is a threat or not." There's an old saying that the future is just the past that hasn't happened yet: This neatly encapsulates Stevens' strategy for identifying one threatening boat among 1,000 harmless ones. By looking at behavioral patterns and analyzing historically how attacks with small craft are carried out, the researchers can predict certain threatening patterns of behavior. They are also collaborating with the Howe School's Dr. J effrey Nickerson on developing a software system that processes data from various sources to predict threats.

Another set of problems is posed by underwater threats carrying explosive devices to ships in port. Both the FBI and the Coast Guard have posted warnings regarding potential attacks against fixed facilities like oil terminals as well as ships. Present sonar technology can easily record its acoustic signature, "Are there unique sounds or acoustic patterns associated with certain objects, as opposed to a large fish or a block of driftwood? Are there surface manifestations that show the presence of a threat? What are the other clues?"

Research will begin with trials in the center's towing tank, which is traditionally used for testing hull designs for ships. Eventually, Bruno hopes to build a mechanical device for use in the Hudson that can reproduce the underwater and surface signatures from posited objects. Once this is accomplished, trials can move out of the tank and into the Hudson River and New York Harbor. "Our divers wouldn't have to try swimming in the Hudson, exposing them to the currents and other dangers," said Bruno.

Ben Curry is a freelance writer in Hoboken, N.J.

STEVENS NAMED A UNIVERSITY PARTNER TO THE HOMELAND SECURITY INSTITUTE

This summer, the Department of Homeland Security (DHS) took a major step forward in increasing its scientific, technological, and management expertise. It appointed a team lead by ANSER (Advancing National Strategies and Enabling Results) to be the sole federally-funded research and development center to the Science and Technology Directorate of DHS. In response, ANSER, directed by Dr. Ruth David, an expert on homeland security and former Deputy Director for Science and Technology at the CIA, formed an independent subsidiary, the Homeland Security Institute (HSI), to receive more than $30 million a year in funding. Stevens was named as one of its six university partners.

Stevens will assist HSI in providing scientific, technical, and management research along with advice on critical scientific/operational issues related to security against terrorist attacks. Other university partners include Auburn, Georgetown, George Washington, Kansas State, and Purdue.

As Dean of the Howe School of Technology Management, I lead the Stevens team that initiated the relationship with HSI. Because we are located in the NY/NJ region, we offer the best access to the global corporate leaders of the pharmaceutical, telecommunications, and finance industries that surround the Institute. Each of these areas is of critical concern to the Department of Homeland Security.

However, a floating object underwater sounds much the same as a big fish, or even a school of fish. "We have to learn to identify an underwater threat in terms of its acoustic signature," said Bruno. "Are there unique sounds or acoustic patterns associated with certain objects, as opposed to a large fish or a block of driftwood? Are there surface manifestations that show the presence of a threat? What are the other clues?"

Research will begin with trials in the center's towing tank, which is traditionally used for testing hull designs for ships. Eventually, Bruno hopes to build a mechanical device for use in the Hudson that can reproduce the underwater and surface signatures from posited objects. Once this is accomplished, trials can move out of the tank and into the Hudson River and New York Harbor. "Our divers wouldn't have to try swimming in the Hudson, exposing them to the currents and other dangers," said Bruno.

Ben Curry is a freelance writer in Hoboken, N.J.

By Dean Jerry Hultin

HSI's Director, Randall Yim, former Managing Director of GAO's National Preparedness Division and Deputy Under Secretary of Defense for Installations under President Clinton, worked closely with me at the Pentagon when I was the Under Secretary of the Navy. Randall's priorities include establishing HSI as the nation's preeminent source of homeland security research and analysis. He intends to build a team, including university partners ensuring that HSI is "second to none" in the security field. I assured him that Stevens was ready to meet this challenge.
Engineering seniors accomplish remarkable design and research innovations in response to the needs of industry. A few of them are highlighted below.

**Award-winning Entrepreneurial Seniors Improve Medical Device**

In early April, Eva Bica, George Collard, Rebecca Gonter, Dominique Gonzalez, and Joseph Grogan advised by Mechanical Engineering Professor Zhenci Zhu won a poster competition at the annual Student Poster Contest, held at the N.J. Chapter meeting of the International Society of Pharmaceutical Engineers (ISPE). In November, Eva presented their project, “Remotely Operated Stitching Devices for Secure Treatment of Abdominal Aortic Aneurysms,” at the ISPE 2004 International Conference in San Antonio, Texas.

The goal of the award-winning poster project was to assist in the treatment of abdominal aortic aneurysms (AAA). Funded by an Advanced E-team grant from the National Collegiate Inventors and Innovators Alliance (NCIIA) to conduct the necessary research and create a feasible solution, their project centered on a unique method for securing the position of an endovascular stent-graft from within the aorta, using spiral Nitinol (Nickel Titanium alloy) clips. In order to develop the most efficient, user-friendly, and safe device, the team engaged input from endovascular surgeons and FDA regulations.

Currently, there are two ways to treat AAA. The first is open surgery which securely sutures the aorta but has the drawback of being highly invasive and costly. The second is a non-invasive alternative to open surgery, endovascular stent-grafting (a procedure similar to angioplasty) which harbors the risks of migration of the graft and leakage. In order to minimize the leakage and slippage of the stent-graft, the team designed a highly flexible remotely operating device that mechanically secures the endovascular stent-graft to the aorta. Its balloon centers and holds the control system, releasing the Nitinol spiral clips that hold the stent-graft in place against the wall of the aorta.

Using the undergraduate materials laboratory at Stevens, the team conducted experiments in a systematic trial and error approach. They ran tests for the best design and implementation of the Nitinol spirals and constructed a prototype using biocompatible materials. The resulting device consists of three parts, a proximal mechanism, which is inserted into the patient, a distal mechanism, which the doctor uses to control the proximal end, and a connector between them.

Supported by the Stevens Patent Committee, the team is seeking intellectual property rights to the innovative aspects of their device which can be used on any stent-graft and may potentially be extended to other uses. Once their provisional patent is complete, they intend to market the device to medical device manufacturing companies for potential licensing agreements.
Engineering and Realization of the Total Knee Replacement (TKR) System

The first total knee replacement surgeries were performed in the 1960s, using hinged implants. These designs were unsuccessful because they constrained the natural rotation and bending of the knee. In the mid seventies, condylar total knee implants allowing knee rotation were designed. By the nineties, more effective implants allowed TKR to become widely accepted as a treatment for patients suffering from severe knee pain and disability caused by damage to the cartilage from arthritis or trauma.

In 2004, Mia Molfino and Michael C. Phipps were part of a design and manufacturing team developing a cutting-edge knee system that allowed patients to regain normal pain-free knee function. The device achieved superior performance to existing systems on the market. Mia and Mike were instrumental in the design and manufacture of a system that allows deeper flexion, less constraint, and more rotation which translated into more natural motion for the patient. The intended design philosophy was implemented and analyzed with the help of computer-aided design programs and simulation software.

Working with their sponsor, Stryker Orthopaedics, Mia and Mike evaluated the knee system on-site at Stryker’s Advanced Technology Department, and by conducting cadaver studies with surgeons, they learned how the implant would perform within the body prior to use by a patient. Advised by Mechanical Engineering Professor Kishore Pochiraju and Project Coordinator Peter Verrillo ’99, they focused on the manufacturing, testing, and evaluation of the system including:

- Evaluation of manufacturability and production issues for both the femoral and tibial components;
- Final inspection and manufacturing drawings;
- Mechanical testing of production quality components and analysis of the resultant data;
- Cadaver study and intraoperative trialing and analysis of resultant data;
- Evaluation and input of design by surgeons for acceptance in the field.

Conducted as a part of their Co-op and senior design project experiences, Mike and Mia helped meet a real-world system design and manufacturing challenge with technical expertise, teamwork and out-of-the-box innovative thinking.

Biometric Security on Campus: the "Thumb-Thing"

Today, the importance of reliable personal security and authorization has increased dramatically with the rise in credit card and identity theft. Identification cards, the main form of personal ID, are highly susceptible to fraud. A team advised by Electrical and Computer Engineering Professor Bruce McNair developed a biometric system that uses thumbprints as identification for both entry and credit access. Rather than needing to provide an ID card or remember a password, individuals simply press their thumb on the fingerprint scanner. The details of the thumbprint are compared against a database of authorized users. Once a match is made, the individual is authenticated and granted access.

Joseph Marques, Michael Andrews, Yohanna Ayala, Brian Podolsky and Jennifer Willis designed the "Thumb-Thing" as a potential replacement for student ID cards on college campuses. At Stevens, for example, the system could replace ID cards for meals, duckbills, dormitory/building access, photocopies, and laundry and other facilities that require identification for access.

...the system could replace ID cards for meals, duckbills, dormitory/building access, photocopies, and laundry and other facilities that require identification for access.

Jennifer Willis, Dean Korfiatis, Yohanna Ayala, Joseph Marques, Michael Andrews and Brian Podolsky
The Evolution from Analog to Digital Radio
Software Defined Radio is the foundation of the first truly universal wireless device enabling the switch from analog to digital radio processing. With an increasing variety of wireless services and the increased demand for RF (radio frequency) spectrum, there is a growing interest in equipment that is flexible enough to adapt to changing channel and interference conditions and that will allow interoperation with myriad legacy systems.

Using the Flex Radio (SDR-1000), Bethel Assefa, Matthew Isaacs, Tsing-Hua Chen, Rommy Guevara, and Sze-Yam Kan, together with graduate research assistant Nishant Kumar, successfully developed an intelligent expandable software-based system, which detects channel conditions and then adapts between frequencies and data rates allowing for the highest quality frequency at significantly reduced bandwidth. Advised by the Director of the Wireless Information Systems Engineering Laboratory (WISELAB), Professor Yu-Dong Yao, their investigation into software defined radio platforms was supported by funding from the National Science Foundation through the Wireless Network Security Center and the Department of Electrical and Computer Engineering.

Robotic Frontiers
Multiple mobile robot coordination has until now been a generally underdeveloped branch of mechanical control engineering. Jacqueline McCarthy, Jared Sapp and Robert Somma advised by Mechanical Engineering Professor Jae-Hung Chung used sensors, a CMU Camera, Lego-based rotational encoders, IR demodulators, and Lego-touch sensors to coordinate tasks shared between two mobile Handy Bug robots. They engineered a distributed control schematic to minimize the possibility of mission failure and working with the "Handy Board", a microprocessor developed by MIT, they successfully programmed two robots to communicate effectively and accomplish a coordinated task of locating and pushing an oblong box towards a predetermined goal. Their work paves the way for the addition of future dynamic variables that will eventually result in the robots interacting in joint exploration, rescue and retrieval missions.

Jacqueline McCarthy, Jared Sapp and Robert Somma

Stevens Hosts West Point Cadets
Recently, the Schaefer School’s Department of Systems Engineering and Engineering Management (SEEM) hosted a group of cadets studying in the Department of Systems Engineering at the US Military Academy at West Point.

SEEM Professor Kate Abel and a group of SEEM students welcomed the cadets, who talked with and received a tour of Davidson Lab from Professor Alan Blumberg of the Center for Maritime Systems.

Following a guided tour of the Stevens campus, both Stevens and West Point groups took a ferry to New York City for a fascinating visit to the USS Intrepid.

“A good time was had by all," said Professor Abel. "We look forward to hosting our West Point friends again in the spring of 2005."
Ryan Donovan, a mechanical engineering major, possesses a creative side. After receiving a camera two years ago, he began to take pictures of the Hoboken-NYC area and trained under a well-respected professional Hoboken photographer. While studying photography, Ryan also became active in the Stevens Photography Club. "Photography appeals to me because it combines both logic and creativity. There are 'formulas' for what are considered interesting pictures, but there still exists that element of imagination."

Today, Ryan is the president of the Stevens Photography Club. He has assisted in photographing weddings professionally and continues to experiment with black and white fine art photography. Ryan's and the Photo Club's work can be seen throughout campus, specifically in the Computer Service Center and on display in the Jacobus Lounge. In addition, there are plans for a photography show in DeBaun Auditorium. If anyone is interested in Ryan's prints featured in this publication, please contact Ryan at rdonovan@stevens.edu.

For more information on area photography please visit www.bkdog.com or www.eschlipf.com.

NEW UNDERGRADUATE CONCENTRATIONS:

PLUGGING THE GAP IN AMERICAN NAVAL ENGINEERING EDUCATION

A critical need recognized by the Navy is the innovative design of ships and in particular naval vessels, which are expected to constitute the primary area for future careers in the US ship design and building enterprise. Aside from programs geared to the training of naval officers, there are few degree programs whose mission is to train the civilians who will work in shipyards, design offices, and Navy bureaus, filling needs for both military and non-military vessels.

Building on its research strengths and long term leadership in the field, Stevens is well-placed to offer a concentration in Naval Engineering under the auspices of its broad-based Engineering curriculum. It will leverage existing courses in ocean engineering as well as existing experimental and modeling facilities to promote creative ship designs.

The program is conducted in concert with Stevens leadership in the Office of Naval Research's Atlantic Center for the Innovative Design and Control of Small Ships, and in collaboration with University College, London, which has one of the leading ship design educational programs in the world.

For more information contact:
Dr. Michael Bruno
Professor and Director of the Center for Maritime Systems
email: mbruno@stevens.edu

ENGINEERING FOR AN INFORMATION DRIVEN SOCIETY

The Departments of Systems Engineering and Engineering Management (SEEM) and Electrical and Computer Engineering (ECE) jointly offer an Information Systems Engineering (ISE) concentration in the undergraduate curriculum.

The goal of the ISE concentration is to produce graduates with a broad engineering foundation who can be effective in the analysis, design, construction, implementation and management of information systems.

The program consists of a core of six classes taken by all students in the concentration. A student can choose either a focus area in information systems management or networked information systems.

For more information please contact:
Dr. Stuart Tewksbury
Director and Professor Electrical and Computer Engineering
phone: 201.216.8096
email: stewksbu@stevens.edu

Dr. John Farr
Director and Professor Systems Engineering and Engineering Management
phone: 201.216.8103
email: jfarr@stevens.edu

The following are typical electives within each focus.

**Network Information Systems (NIS)**
- CpE 360 Data Structures and Algorithms
- CpE 490 Information Systems I
- EE 441 Introduction to Wireless Systems

**Information Systems Management (ISM)**
- EM 301 Engineering Cost Management
- EM 466 Total Quality Control
- SYS 510 Business Process Engineering
To many in the Stevens community, Warren Wells is still "the man who knows the score." Wells has worn many hats in his successful career – WWII radar specialist, university instructor, automation engineer, co-founder and treasurer of his own company, and a designer of complex moveable sets for the Broadway Theater.

But perhaps his most important role in recent years has been as a catalyst for the upgrade and construction of undergraduate labs for future generations of Stevens engineering students. Wells’ generosity in giving is nothing new. In the early 1990’s, he served as Chairman of the Theater Restoration Committee that raised $2.5 million for the renovation of the re-dedicated DeBaun Auditorium. In 1994-95, he was a key volunteer on the Kresge Challenge Campaign, helping to raise $1,500,000 for the completion of the Schaefer Athletic Center.

He and his late wife Ruth personally donated their lake house as a "retained life estate" to Stevens in the late 1990’s.

Another donation funded the renovation of the Warren and Ruth Wells Engineering Design Lab located in the McLean Building. Wells has also encouraged fellow 1942 classmates to adopt additional labs. Consequently, two other labs were renovated with their support: The Elsie Hattrick Design Laboratory and the Betty & Art Francis Microelectronics Systems Laboratory, both on the first floor of the Burchard Building.

"If you ever want to learn the score in anything around Stevens, Warren is your man." So read the gossipy write-up about graduating senior Warren Wells in the Stevens Link of 1942. "No matter what you ask him," it continued, "he will readily give you the pertinent information. The stuff will be reliable, too, since Warren’s name is continually on the Dean’s List."

"The way Warren and his classmates have improved and established many of our engineering labs has been inspirational," said Assistant Vice President for Development Marjorie H. Everitt. "Warren’s role has been central to what has been accomplished. It makes it all the more meaningful that his continued help is so significant and forward-looking."
Robert Thurston, who served as ASME’s first President from 1880 to 1882, joined Stevens as a professor of mechanical engineering in March 1871. He established the first mechanical laboratory for research and testing along with the first curriculum that combined theory and research with practical shop experience. The mechanical laboratory, which was established in 1875, was the first of record in the United States to combine research, instruction, and commercial work. It focused on the field of materials, friction, and standardization of methods for testing boilers, and internal combustion and steam engines. Professor Thurston was widely published and held two patents, one for an autographic recording testing machine for material in torsion, and one for a machine for testing lubricants.

The American Society of Mechanical Engineers (ASME) was founded on April 7, 1880 at Stevens Institute of Technology in Hoboken, New Jersey. About 80 engineers - industrialists, educators, technical journalists, designers, shipbuilders, military engineers, and inventors, including Stevens Professor Robert W. Thurston - assembled ASME's first Board of Governors.

Today’s ASME is a premier 120,000-member professional organization for promoting the art, science, and practice of mechanical and multidisciplinary engineering and allied sciences throughout the world. Focused on technical, educational and research issues of the engineering and technology community, ASME conducts one of the world’s largest technical publishing operations, holds numerous technical conferences worldwide, and offers hundreds of professional development courses each year.

To mark the 125th Anniversary of the Society's founding, Stevens Institute of Technology, the Schaefer School of Engineering, and the Department of Mechanical Engineering will host several events April 7-9, 2005, on Stevens’ campus. Among these will be a black-tie commemoration and awards gala to be held in the Frederick L. Bissinger Room on the evening of April 7th. President Raveché and Dean Korfiatis will preside over the festivities. On the evening of April 8th, in the Grace E. and Kenneth W. DeBaun Auditorium, there will be a lecture given by the recipient of the Roe Medal, and a performance by the Romanian Orchestra of Engineers - a unique 50-year-old orchestra of practicing engineers from the Bucharest Philharmonic. The concert will be followed by a champagne reception at the Samuel C. Williams Library.

For more information on the anniversary celebration and concert, please contact Marta Cimillo at 201-216-5263.
This fall, 20 students of diverse backgrounds began a course of graduate study that will earn them a master’s degree in product-architecture and engineering.

As founding Director of the Product-Architecture Lab, my objective is to encourage these future design and building professionals to embrace collaborative work methods as they pursue nascent topics in design in the context of manufacturing methodologies and advanced material studies. The program brings into question long-standing and separate traditions in the education of designers and engineers, and in doing so forges a distinctive fusion of design culture, technology, and services.

In its inaugural year, The Product-Architecture Lab has captured the national attention of innovators in the design industry. Gehry Technologies of Los Angeles, Tri-Pyramid Structures, an integrated design and manufacturing company in Westford, MA, as well as BitForms, a world-renowned NYC art gallery involved in the convergences of art and technology, are among the program’s research collaborators.

The program is headquartered in Stevens’ historic Carnegie Laboratory — a facility that at the turn of the last century emerged as a state-of-the-art manufacturing facility. With the recent addition of the advanced digital media lab — a suite of PCs and Macs; design software such as CATIA, Digital Project, Maya, Rhino, and Solidworks; video editing and digital imaging software; 3D scanners and other gear – the Product-Architect Lab leaps into this new century at the forefront of design and manufacturing technology.

The current student body — a mix of architects, engineers, product designers, mathematicians, and computer scientists — are grouped in interdisciplinary teams which study product design, buildings, and their component parts, with an emphasis on understanding design and production technologies, so that they may seek innovative ways to build sophisticated forms. Current design and research projects include the enclosure and interactive exhibition for the Concorde, currently housed on the Hudson River in the Intrepid Museum; “Apse-traction,” the architectural design and fabrication for a local church in Hoboken; interactive and information design for an upcoming commercial airline launch; the design of a prefabricated suburban house prototype; and the parametric design of a surfboard integrating algorithmically-based shape optimization methodologies.

Both the “Speaker Pavilion” and the “Apse-traction” projects, recently, received Professional Design Awards from the N.J. Chapter of the American Institute of Architects.

For further information, please visit our web site at: http://www.stevens.edu/prodarch

To schedule a tour of the program and facilities, please email the director at: jnastasi@stevens.edu
GENEROATING IP:
RECENT FACULTY PATENTS

The Highly Filled Materials Institute’s patent covering a novel method and apparatus for the determination of particle size distributions (Dr. Rahmi Yazici and Dr. Dilhan Kalyon) was issued on June 15, 2004 (US Patent #6,751,287). This method complements earlier developed analysis methods of HfMI on the quantitative characterization of structural distributions including the quantitative characterization of degree of mixedness.

Dr. Dinesh Verma and Dr. Caroline Smith were awarded US Patent #6,763,337, issued July 13, 2004, for “Weighted Wedge Defuzzification for Conceptual System Design Evaluation,” a method and a system for applying the method, for an exact and computationally efficient solution for defuzzification that uses linear and non-linear weighted wedge approaches.

Dr. Christos Christodoulatos and Dr. George P. Korfiatis were awarded US Patent #6,752,926, issued July 22, 2004, for “A method and apparatus for treatment of wastewater,” a closed bioreactor for high organic carbon removal and ammonia conversion in high-strength wastes under microgravity conditions.

Dr. Ronald Besser was issued US Patent #6,731,061, May 4, 2004, for “A Dual-Layer Electroplated Structure for a Flat Panel Display Device.” The patent describes a process for generating a metallization layer, through electroplating, which is novel in that it is suspended above the substrate and hence can be used as a floating electrode to steer electrons emitted from the surface of the device. This process was developed by Dr. Besser when he held the position of Senior Scientist at Candescant Technologies Corporation of San Jose, California.

FORGING DYNAMIC NEW PARTNERSHIPS IN SYSTEMS ENGINEERING

The Federal Aviation Administration (FAA) and Stevens
A Partnership Agreement in Systems Engineering Education and Research was signed between the FAA’s William J. Hughes Technical Center and Stevens. The agreement provides for a Systems Engineering Graduate Education Program for the William J. Hughes Technical Center and involves collaboration on the development of systems engineering related research ideas, themes, and topics of mutual interest.

Stevens and Växjö University: Academic Collaboration
Stevens and Växjö University, Sweden, signed a Memorandum of Understanding, the result of several conversations between Stevens’ Associate Dean Dinesh Verma and Växjö Associate Professor Håkan Bard. The Schaefer School of Technology and Design at Växjö will explore opportunities of mutual benefit such as a Heavy Vehicles R&D program, collaborative faculty research, and faculty/student exchange. Undergraduate and graduate student exchanges will be established between the international offices of both universities and will include collaborative virtual team projects.

Stevens and the Air Force Institute of Technology
A Memorandum of Understanding was signed between Stevens and the Air Force Institute of Technology, WPAFB in Dayton, Ohio, with the goal of leveraging the strengths of both organizations towards the betterment of Systems Engineering application and implementation through research, education, and executive training.

Northrop Grumman and Stevens
A Memorandum of Understanding was signed between Northrop Grumman Corporation—Airborne Early Warning and Electronic Warfare Systems and Stevens’ System Design and Operational Effectiveness Program (SDOE) to provide for an exclusive Master of Engineering in Systems Engineering Program, administered and delivered by SDOE to the employees of Northrop Grumman.
MECHANICAL ENGINEERING

Dr. Frank T. Fisher joins the Department of Mechanical Engineering as an Assistant Professor. His research interests include modeling the mechanical behavior of nanoparticle-polymer composites, with a focus on carbon nanotube-polymer systems. Other research interests include nanoscale experimental mechanical characterization, multi-scale modeling techniques incorporating atomistic-level information into continuum-level theories, industry-friendly nanoparticle-polymer processing techniques, bioinspired/biomimetic materials, and NEMS/MEMS sensors and devices. Dr. Fisher has 17 refereed journal publications and earned his master’s and doctorate in Mechanical Engineering and a master’s in Learning Sciences at Northwestern University.

Dr. Yong Shi recently joined SSoE as an Assistant Professor in the Mechanical Engineering Department. He will be doing research and teaching in the general areas of NEMS/MEMS, micro/nano fabrication as well as structures and materials. He worked in the Micro/Nano Systems Laboratory and the Microsystems Technology Laboratory at MIT before he joined Stevens. His research interests include micro actuators/sensors development, optical/bio micro-systems design, modeling and fabrication, active materials/structures, structure health monitoring, and nanofibers/nanocomposites. He earned his doctorate and a M.S. in Aeronautics and Astronautics at MIT. Before he attended MIT, he was an aerospace engineer at Beijing Spacecraft, Beijing, China, and later became the research director of the composites department.

Mark R Sullivan has joined the Department of Mechanical Engineering as a software architect. He completed his bachelor's degree in Engineering and his master's degree in Computer Science at Stevens. Mr. Sullivan has a strong appreciation for scalability and metrics, and a broad familiarity with Internet mail systems and related standards; he also asserts his knowledge of and belief in both free and open source software, extreme programming, and feature driven development. Mr. Sullivan has worked for a number of private companies as a software developer, including Mail.com, Approach, Inc., and BOC.

SYSTEMS ENGINEERING & ENGINEERING MANAGEMENT

Dr. David Nowicki joins the Systems Engineering and Engineering Management Department as a Research Assistant Professor and Director of the Value Chain Enterprise Systems Program. Before Stevens, he was Director of Product Development in Service Life-cycle Management at Servigistics and held various executive positions at I2Technologies and the TFD Group in Product Development Technology Evaluation and Consulting. His current research involves supply chain management, reliability, and spares optimization. He hails from the University of Wisconsin-Madison, where he earned a bachelor’s and a doctoral degree in Industrial Engineering Operations Research as well as a master’s degree in Industrial Engineering Operations Research from Virginia Tech.

Dr. José Emanuel Ramirez-Marquez, who obtained his doctoral degree from Rutgers University, joins the Systems Engineering and Engineering Management Department. Dr. Ramirez-Marquez research is directed at longtime decisions related to systems reliability. He has worked on optimization heuristics for maintaining and enhancing engineering systems, techniques for engineering systems, techniques for assessing component importance and criticality, and systems uncertainty reduction through efficient testing plans.
Eirik Hole holds a Dipl.Ing. degree in Aerospace Engineering from the University of Stuttgart in Germany. He is currently a Lecturer and a Ph.D. candidate in the Department of Systems Engineering and Engineering Management. Before coming to Stevens, Hole had eight years of experience working in various systems engineering related positions. He began his career in the core systems engineering team on a new generation anti-ship missile system program in Norway. He worked in Munich, Germany as a Systems Engineer on European military programs and has recently worked as a consultant in the area of applied systems engineering and requirements management as well as on the practical application of SE and RM tools. Hole’s research interest is in improving methods for the logical and physical partitioning of systems to support system architecting and design.

Bruce Barker joins the Department of Systems Engineering as an Industry Professor. With over 20 years of experience in the information technology industry, he has been employed by IBM, Bank of America, Lockheed Martin Undersea Systems, and Loral Corporation. During that time, he worked as a Software Engineer, an Architect, a Project Manager, and a Systems Engineer designing, developing, and deploying sonar systems under federal contracts for the US Navy. Most recently, he applied his knowledge to the commercial sector as a Senior Systems Engineer for IBM Global Services. He also published a patent in the area of project and program estimation and currently has a patent pending in the area of Systems Engineering process. Mr. Barker received his master’s degree in Systems Engineering from Stevens, a computer science degree from the University of Texas, and an economics degree from the University of Virginia.

COMPUTER & ELECTRICAL ENGINEERING

Dr. Yan Meng, who received her doctorate from Florida Atlantic University, joins the Department of Electrical and Computer Engineering from the faculty of Jackson State University. Her research spans intelligent robotics, computer vision, real-time embedded systems, computer architecture, and communication networks. Dr. Meng, who has worked for several companies, is interested in employing state-of-the-art algorithm designs and analyzing technology to solve problems arising from real world intelligent robotic systems.

Dr. Nader Mohamed, who obtained his doctorate from the University of Nebraska-Lincoln, joins the Department of Electrical and Computer Engineering. He has extensive experience in industry as an IT consultant, IT Projects Leader and Software Developer. His research is on computer systems, networking software systems, scalable communication, middleware for multiple network resources, and cluster- and grid-based computing. Dr. Mohamed also works in object-based networking, active and content based networking, and embedded real-time systems.

Dr. Jameela Al-Jaroodi, is currently a Research Assistant Professor in the Electrical and Computer Engineering Department. She obtained her doctorate in computer science from the University of Nebraska-Lincoln. Al-J jaroodi earned a master’s degree in computer science from Western Michigan University and a bachelor’s degree in computer science at the University of Bahrain. Her research interests include distributed system middleware, heterogeneous systems, parallel and distributed programming models, wireless networks, and security. She currently has more than 25 publications in major refereed journals and international conferences. Dr. Al-J jaroodi is a member of IEEE, IEEE Computer Society, and IEEE Communications Society in addition to the ACM.

CHEMICAL, BIOMEDICAL & MATERIALS ENGINEERING

Vikki Hazelwood comes to Stevens after a distinguished career in industry. Most recently, she has held executive positions in sales and business development for several medical device companies focused on drug delivery technology and biomaterials for orthopedics and interventional cardiology. Hazelwood has worked closely with surgeons and area hospitals in a clinical setting, and has collaborated on numerous projects with medical device companies. She received her master’s in Biomedical Engineering from the New Jersey Institute of Technology, and is currently executing a doctorate in Biomedical Engineering at NJ IT-UMDNJ, with research emphasis on the development of biomaterials for medical implants. She joins the Chemical, Biomedical, and Materials Engineering Department as a Senior Lecturer.
**CIVIL, ENVIRONMENTAL & OCEAN ENGINEERING**

**Dr. Len Imas** received his doctorate in numerical hydrodynamics from the Ocean Engineering Department at MIT. His graduate research focused on nonlinear contact line dynamics at a free-surface/body juncture and application of large eddy simulation to flows past a complex geometry in the presence of a free-surface. He also holds a BS and M.Eng in aeronautical engineering from Rensselaer. Imas' area of expertise is numerical hydro-mechanics. His work covers a wide range of topics including simulation of breaking waves around surface ships, prediction of extreme wave loads on and vortex-induced vibrations/motions of off-shore structures, supercavitation applications to underwater vehicles; reduced order modeling, prediction of boundary layer transition, and microbubble drag reduction. At Stevens, he is currently working on projects involving prediction and analysis of swimmer wakes and high speed vessel wakes in restricted waterways.

**Dr. Rustam Stolkin** is joining Davidson Laboratory in the Department of Civil, Environmental, and Ocean Engineering as a Research Associate. Dr. Stolkin received his master’s in Engineering Science from Oxford University and received his doctorate in Computer Vision from University College London in 2004. While pursuing his doctorate, he worked for Sira Ltd. as a research associate. Dr. Stolkin's doctorate work focused on robot vision, specifically tracking known objects across very poor visibility video sequences, camera pose estimation and tracking for robot navigation, novel segmentation algorithms, and novel use of prior knowledge and machine learning.

**Dr. Patrick B. Burke** has joined Davidson Laboratory in the Department of Civil, Environmental, and Ocean Engineering. Before pursuing post-graduate work here at Stevens, he worked at Abbington Associates as a project engineer. Among other activities, Dr. Burke participated in the New Jersey Department of Environmental Protection Toxics Reduction Workplan for NY-NJ Harbor, performing numerous hydrodynamic, water, and suspended sediment quality studies through the implementation of state-of-the-art instrumentation. He also conducted land- and water-based surveys along the New Jersey coast, including sites at Sandy Hook, Spring Lake, Long Beach Island, Townsend’s Inlet, and Cape May. Dr. Burke received both his master’s degree and his doctorate in Ocean Engineering from Stevens.

**Dr. Mei-Juan Han** is joining the Center for Environmental Systems as a Research Associate. She received her master’s degree in chemistry from Hebei Normal University in 2001 and obtained her doctorate from the Chinese Academy of Sciences’ Institute of Chemistry. Dr. Han's current research interests focus on the construction and characterization of nanostructures, investigation into the physical and chemical properties of single molecules, and applied scanning probe microscopy.

**Dr. Mahmoud Wazne** is joining the Stevens faculty as a Research Assistant Professor at the Center for Environmental Systems. He has been working at Stevens as a post-doctoral Research Associate and Research Assistant since 2000, working on the stabilization and remediation of mining ore residue and the removal of heavy metals from soil and water. Previously, he worked as a Licensed Civil Engineer in construction and building management in Lebanon. Dr. Wazne's research interests center on the hydration and swelling of cementitious materials, groundwater hydrology and pollution, geochronal modeling, remediation of soil and water contaminated by heavy metals, and biological remediation technologies. He received a master's degree in Civil Engineering from Columbia University and his doctorate in Environmental Engineering from Stevens.
Dr. Henry Du and his interdisciplinary research team have pioneered work on the integration of photonic crystal fibers (PCFs) with nanoscale technologies that will potentially lead to robust chemical and biological sensing devices. The National Science Foundation granted Du's team $1.3 million to pursue the multidisciplinary project which also involves postdoctoral fellows, graduate students, and undergraduate/high-school summer research scholars, affording them essential training in view of the challenges faced by the nation. Using molecular and nanoscale surface modification, state-of-the-art laser techniques, and computer simulation, their research seeks to enhance PCF sensors, sensor arrays, and sensor networks for diverse applications such as remote and dynamic environmental monitoring, manufacturing process safety, medical diagnosis, early warning of biological and chemical warfare, and homeland defense. "Through basic and applied research," said Du, "the optically robust PCFs with surface-functionalized, axially-aligned air holes are expected to achieve a quantum leap in chemical and biological detection capability over conventional fiber-optic sensor technology."

The National Science Foundation recently awarded a five-year, $6 million AGEP (Alliance for Graduate Education and the Professoriate) grant to a regional consortium of universities. The purpose of the grant is to increase minority access to graduate education in the sciences, technology, engineering, and mathematics disciplines. Participating institutions include Stevens, NJIT, and NY Polytechnic University, with CUNY Graduate Center as the lead organization. Stevens co-principal investigators are Dr. Kurt Becker, Director of Physics and Associate Director of the Center for Environmental Systems and Judy Cuddy, the SDOE Program's Director of Executive Education and Outreach.

Dr. John Farr is the American Society of Engineering Education (ASEE) 2004 winner of the Merl Baker Award. Named after a founding father of the academic discipline of engineering management (EM), it is awarded to a member of the EM Division who has provided significant service to the Division. Dr. Farr also received the Bernard R. Sardet Award at the 25th annual American Society of Engineering Management (ASEM) Conference. This award is one of the highest given by the society and is based on contributions to ASEM at both local and national levels.

The Stevens Transportation Research Group directed by Professors Hassiotis, Chung and Berkof recently hosted the New Jersey Department of Transportation’s “NJ DOT Research Showcase 2004.” The Showcase featured panel discussions to identify future research needs and highlight completed research projects. There were also keynote addresses from NJ DOT management and congressional representatives, recognition of outstanding students, and booth and poster displays from the research community.

Dr. Xiaoguang Meng is the recipient of this year’s Research Award from the N.J. Section of the American Water Works Association (NJ AWWA). The award is given for outstanding work in drinking water research within New Jersey. It was presented to Meng at a NJ AWWA Seminar at the N.J. Hospital Association’s Conference Center in Princeton.

Recently, the Highly Filled Materials Institute (HfMI) received funding from the Office of Naval Research, Picatinny ARDEC, IBM, MPR, and other corporations. With Picatinny ARDEC, HfMI has developed a new process for the manufacture of black powder, the first significant change in its manufacture since the Chinese discovery. The process reduces the cost of manufacture while improving quality significantly. Together, they are also working to commercialize HfMI technologies in the areas of continuous and flexible manufacture of energetic materials and other highly filled materials. In addition, HfMI’s adjustable gap rheometry patent and associated extrusion technologies were licensed for commercialization (to MP&R, Inc. of Hackensack, N.J.).

Dr. R. Chandramouli and David Wagner Associates have jointly received a $100,000 STTR Phase-I grant from the US Air Force Research Lab to develop a commercial software product based on Chandramouli’s research in steganalysis (forensic analysis) to automatically scan emails and web downloads for hidden messages.

Dean Korfiatis appointed Dr. Michael Pennotti as the Director of the System Design and Operational Effectiveness (SDOE) Program, one of the preeminent Systems Engineering (SE) programs in the US, in independent government and industry assessments. In 2001, he joined Stevens after more than 30 years of SE leadership at Bell Labs and executive positions at AT&T, Lucent, and Avaya. He holds a doctorate in Electrical Engineering from the Polytechnic Institute of NY, and is a senior member of both IEEE and ASQ.
The Conference on Systems Engineering Research is scheduled to be held at Stevens Institute of Technology in Hoboken, NJ on March 23-25, 2005. Its objective is to provide practitioners and researchers in academia, industry, and government a common platform to present, discuss, and influence Systems Engineering research with the intent to enhance Systems Engineering practice and education.

This year’s conference hosts an incredible number of prestigious academic and industry representatives from across the globe, with participants such as Mr. Kelly Miller, Chief Systems Engineer, NSA, Gunnar Hult, Chief Scientist, Swedish Material Command, and Mr. Ralph Nelson, Vice-President for On Demand, IBM Global Services. Presentations will include industry leaders such as Nokia, Raytheon, Lockheed Martin, Citigroup, Boeing, NASA, Northrop Grumman, and Volvo, and from academia: Chalmers University of Technology, Sweden; University of Toulouse, France; Cranfield University, UK; Royal Institute of Technology/KTH, Sweden; Chemnitz University of Technology, Germany; and Vienna University of Technology, Austria.

The conference will focus on the following broad areas:
- Secure and Intelligent Network Centric Systems
- Agile Systems Engineering, Development, Integration, and Deployment
- Robust and Sustainable System Design and Architecture
- Integrated Systems and Software Engineering and Development
- Application of Systems Engineering to an Extended Enterprise System
- Systems Engineering Methodologies, Practices, Methods, Tools, and Metrics
- Collaborative Engineering: Environments and Organizations

Also included are the following tracks: Executive Panels, Doctoral Papers, Case Studies, Research Colloquia, and Research Paper Presentations.

Finally, the conference will round off with a tour of the New York Stock Exchange.

For Registration and Other Details Contact:
Dr. Rashmi Jain, Chair, Conference Technical Program
Associate Professor of Systems Engineering
Charles V. Schaefer, Jr. School of Engineering
Stevens Institute of Technology
Castle Point on Hudson
Hoboken, N.J. 07030
Tel: 201.216.8047 or 201.216.8025
Email: rjain1@stevens.edu