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Director's Message

NSF approves IMSC's critical renewal as an ERC

We were very pleased that the National Science Foundation (NSF) gave approval in March of the final five-year contractual renewal for IMSC as an NSF Engineering Research Center.

As a result, IMSC will continue as part of NSF's ERC program until 2007—thus successfully participating for the maximum 11-year period provided by the ERC program.

We are especially gratified by NSF's decision because it provides a welcome validation of IMSC's successes of the past seven years and affirms our planned direction for the future. This NSF approval process began with a site visit by an NSF review team in June 2002. For the visit, we showcased our latest research, including new Internet application technology, IMSC's Remote Media Immersion (RMI), for capturing, streaming and rendering high-resolution, big-screen digital video and multichannel Immersive Audio.

We are continuing to develop RMI, which has just been awarded an Honorable Mention by the Corporation for Education Network Initiatives in California (CENIC) in its "On the Road to a Gigabit" award program. CENIC coordinates high-speed network initiatives linking educational institutions in California and links to other networks across the nation as well. RMI is available for movie theaters that are leading in the developing trend of digital distribution of movies.

We are moving forward rapidly with our three new

overarching application "vision" projects in communication, education and entertainment. The projects, defined last year as part of the NSF renewal process, build on our research over the past seven years.

We will spotlight our progress in the vision projects in special sessions at the next Scientific Advisory Board (SAB) meeting on June 2 and at this year's NSF site review visit on June 3-4.

IMSC faculty members are making great strides this year, and several have been recognized recently with honors.

Prof. Mathieu Desbrun, assistant professor of computer science who specializes in computer graphics, will receive the Significant New Researcher Award from the Association of Computing Machinery (ACM) SIGGRAPH at the SIGGRAPH 2003 Conference in July.

In March, Prof. Alan Willner, IMSC's Associate Director for Student Affairs and professor of electrical engineering, was one of two USC professors to receive the University's highest annual teaching award, the 2003 USC Associates Award for University-Wide Excellence in Teaching.

In April, Prof. Robert Scholtz, head of IMSC's Ultrawideband (UltRa) Lab and professor of electrical engineering, received the Senior Faculty Research Award this year from the School of Engineering, and Prof. Shrikanth Narayanan, associate professor of electrical engineering, computer science and linguistics, received the School's Junior Faculty Research Award. Prof. Narayanan also received an NSF Early Career Award this year, as we report below.



Dr. Ulrich Neumann

Prof. Narayanan receives NSF Career award

Dr. Shrikanth Narayanan, a key IMSC investigator in speech processing, has received an Early Career Award from the National Science Foundation (NSF).

The prestigious award provides \$500,000 for research, teaching and outreach activities during the next five years. The NSF Early Career Development Program identifies and supports young faculty



Prof. Shri Narayanan

who are most likely to become academic leaders.

Dr. Narayanan, an associate professor of electrical engineering, computer science and linguistics, is IMSC's Research Area Director (RAD) for the Application Research Projects (ARP) area and co-leader of the Communication vision project.

The Application Research Projects area includes BioSIGHT, which is prototyping advanced immersive learning environments while addressing the reality of today's classrooms; the Haptic Museum, which involves

development of haptic devices used to touch virtual objects over the Internet; and ImmersiNews, which involves developing a system to immerse users in interactive, customized news experiences.

As one of three IMSC's long-term vision projects, the Communication vision project is developing a distributed multi-sensory interactive environment. The other two vision projects are in entertainment and education.

Dr. Narayanan said the Communication vision project is presently focusing on a specific application development environ-

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Student conference explores trends in multimedia

With the theme, "The Next Step," the Seventh Annual IMSC Student Conference in March explored future trends in multimedia technology and communication as well as the social and business impact of trends in the telecommunications industry.

Keynote speaker Joseph Lawrence, senior director of business and development at Qualcomm, discussed future trends in the telecommunications industry.

A luncheon panel on the business outlook for multimedia communication included speakers from the USC School of Engineering, the Marshall School of Business and the Annenberg School for Communication, among others.

IMSC students presented research projects, and Best Paper awards were given in both undergraduate and graduate categories.

The undergraduate winners were Michael Maturo for "Peer-to-Peer Industry Solution Survey and Related Testbed Development," Joseph Tepperman for "Spoken Name



STUDENT CONFERENCE PANEL—David Bowman, chairman of Lincolnshire International in Los Angeles (sixth from left) discusses the business outlook for multimedia communication. Other panel members were (from left to right) Dr. A. Michael Noll, professor of communication, Annenberg School for Communication; Dr. Omar El Sawy, Director of Research, Center for Telecommunications Management, Marshall School of Business; Prof. Larry Pryor, assistant professor of journalism, Annenberg School for Communication; Prof. Ulrich Neumann, IMSC Director; Joseph Lawrence, Senior Director of Business Development, Qualcomm; Prof. Alan Willner, IMSC Associate Director for Student Affairs; and Dr. Elizabeth Fife, Research Fellow, Center for Telecommunications Management.

Recognition," and Aaron Yang for the "Expression Synthesis Project."

The graduate winner was Kiyoun

Yang for "Real-time Pattern Isolation and Recognition over Immersive Sensor Data Streams."

Prof. Narayanan . . .

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ment for clinical breast examination (CBE) training, which provides a vehicle for data elicitation, prototyping and evaluation.

He pointed out that his IMSC roles as a RAD and co-leader of the Communication vision project blend well because of the integrated nature of IMSC's research approach. He explained that even his own research in the area of speech processing benefits from the cross-disciplinary nature of IMSC's project.

"Speech is an orchestration of cognitive, physiological and social processes, so it is important to call on other disciplines in research projects," he said.

Dr. Narayanan, who is from Chennai (previously named Madras), India, received his bachelor's degree in electrical engineering in India and then came to the United States to attend UCLA for graduate work. He earned both a master's and a Ph.D. degree in electrical engineering at UCLA and then worked at AT&T Bell Labs and AT&T Research Labs in New Jersey from 1995 to 2000, where he collaborated with top investigators in the latest speech processing research.

"At the time, Bell Labs was a major research center for speech processing research," he said. "It was really exciting

and that's where I developed a very strong interest in the field."

Then, in 2000, Dr. Narayanan joined the USC faculty and began working with IMSC. He started IMSC's Speech Analysis and Interpretation Laboratory (SAIL), stressing cross-disciplinary collaboration.

In the past year, the laboratory has received major funding from the Defense Advanced Research Projects Agency (DARPA), NSF, National Institutes of Health and USC's Zumberge Interdisciplinary Research grant program in the areas of speech processing and spoken language research.

One DARPA project involves developing a system that will automatically translate from English to Farsi (Persian) and Farsi to English in real-time to enable soldiers or military doctors to communicate more easily with Farsi speakers.

Investigators on these projects include USC faculty from such diverse disciplines as electrical engineering, industrial and systems engineering, linguistics, communication, neuroscience and psychology.

"IMSC is one of the great places to foster interdisciplinary work. When we develop immersive environments, the numerous research components—speech, vision, audio, graphics, and haptics, among others—are immeasurably enhanced in the course of working in this cross-disciplinary research environment," Prof. Narayanan said.