UC San Diego Inaugurates Information Theory and Applications Center in Calit2

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Doug Ramsey

Alon Orlitsky, Director, Information Theory and Applications Center , Calit2

The University of California, San Diego has created a new research center to explore and apply the basic theory that underpins the digital revolution. The Information Theory and Applications Center (ITA) will study the fundamentals of information theory and develop related applications in communications, computer science, bioinformatics, statistics, finance and other disciplines.

As part of the UCSD Division of the California Institute for Telecommunications and Information Technology (Calit2), ITA will draw faculty and graduate students from the university's Jacobs School of Engineering and affiliated research units including the Center for Magnetic Recording Research, Center for Wireless Communications, and San Diego Supercomputer Center. Initial funding will come from Calit2, which hopes to leverage synergies among UCSD researchers to attract federal as well as corporate support for an ambitious research agenda that will range from theoretical work to applications with near-term commercialization potential.

"UCSD has amassed a world-class collection of faculty with extensive experience in information theory," said Ramesh Rao, director of Calit2's UCSD Division and himself a former member of the governing board of the IEEE Information Theory Society. "In opening this new center, we hope to galvanize cross-disciplinary research among UCSD faculty, and to harness breakthroughs in information theory for the benefit of California businesses and citizens."

The university has appointed Alon Orlitsky as Director of the ITA Center. Orlitsky holds a joint appointment in the Jacobs School's Electrical and Computer Engineering (ECE) and Computer Science and Engineering (CSE) departments. "Professor Orlitsky is uniquely equipped to organize both the theoretical and applied areas of this new research endeavor," said Jacobs School Dean Frieder Seible. "He has worked in both industry and academia on projects ranging from data compression and communication to quantitative investment. So he is keenly aware of the potential real-world benefits of information theory."

Orlitsky was a quantitative analyst with the investment firm D.E. Shaw & Co. before joining the UCSD faculty in 1997. Previously, he was technical staff member at AT&T Bell Labs' Mathematical Sciences Research Center, after receiving his Ph.D. in electrical engineering from Stanford University in 1986.

The new center will be inaugurated on Wednesday, February 8, at 11 a.m. as part of a week-long workshop to be held in Calit2's recently-opened building on the UCSD campus.

"In addition to conducting the research itself, we will focus on collaborations with other leading researchers and institutions, and on introducing the UCSD and Calit2 communities to the most up-to-date information technology research," said ITA director Orlitsky, who organized the inaugural workshop that runs Feb. 6-10. "The roster of attendees participating in this inaugural workshop, and hopefully our future conferences, symposiums

and short courses, will reflect a cross-section of international experts from both the academic and corporate research communities."

Information theory is nothing new to the UCSD campus. It has flourished in ECE and other departments ever since it was propounded by mathematician Claude Shannon over fifty years ago. Early UCSD engineering professor Irwin Jacobs and professor emeritus Andrew Viterbi went on to found Linkabit and QUALCOMM, two companies that applied the concepts of information theory to digital communications - creating many innovations in the process, including third-generation CDMA cell-phone technology. Both Viterbi and Jacobs will participate in ITA's inauguration. (Viterbi in 1991 and ECE professor Jack Wolf ten years later won the IEEE Information Theory Society's highest honor, the Claude E. Shannon Award.)

Two ECE faculty members currently sit on the IEEE society's Board of Governors: Kenneth Zeger, and Alexander Vardy. Vardy also won the society's most recent best-paper award jointly with Ralf Koetter of the University of Illinois at Urbana-Champaign for their work on algebraic soft-decision decoding of Reed-Solomon codes. Media Contact: Doug Ramsey, (858) 822-5825. **Multimedia Links:** Information theory is the subject of the annual Shannon Memorial Lecture at UCSD, launched in 2003. The first three lectures are available in streaming video [Real player required] at: - 2005: Robert McEliece, Caltech on *Are there Turbo-Codes on Mars?* http://rpvss.ucsd.edu:8080/ramgen/calit2/McEliece2005.rm Length: 1:00:43; - 2004: Lloyd Welch, University of Southern California on *Hidden Markov Models and the Baum-Welch Algorithm* http://rpvss.ucsd.edu:8080/ramgen/calit2/welch.rm Length: 44:17; and - 2003: Toby Berger, Cornell University on *Information Theory in Neural Nets* http://rpvss.ucsd.edu:8080/ramgen/calit2/tobyberger.rm Length: 1:15:56