# Calit2 Researchers at UC San Diego Honored for Innovations in Networking

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Researchers from the University of California, San Diego participated in two of the four groundbreaking projects that today were named recipients of the 2010 Innovations in Networking Awards. The awards are given annually by the Corporation for Education Network Initiatives in California (CENIC) for the innovative use and expansion of high-performance networking.

For the third year in a row, the award for Experimental/Developmental Applications went to researchers affiliated with the California Institute for Telecommunications and Information Technology (Calit2). UCSD Jacobs School of Engineering electrical and computer engineering professor George Papen picked up the award on behalf of his colleagues on the Scalable Energy Efficient Datacenters (SEED) project.

In 2009, Calit2's GreenLight project - which also focuses on energy efficiency in computing -- picked up the same award, and in 2008, the award in the same category went to CineGrid, the digital cinema consortium incubated in the UCSD division of Calit2.

Calit2 was also honored indirectly in the High Performance Networking Applications category, for its joint project with Australia's Monash University. Monash professor David Abramson accepted the award on behalf of the two institutions.

The 2010 award ceremony took place at the three-day CENIC Annual Conference, "Full Speed Ahead," which began on March 8 in Monterey, CA. Other awards were presented in two categories: Educational Applications; and Gigabit/Broadband Applications. The latter showcases efforts to further the deployment of broadband in underserved areas of California. The other three categories highlight exemplary innovations that leverage ultra high-bandwidth optical networking, particularly where those innovations have the potential to revolutionize the ways in which instruction and research are conducted.

**Scalable Energy Efficient Datacenters**

One of the most interesting and potentially revolutionary outcomes of the development of the Internet is the ability gained by every person on Earth to generate enormous amounts of data, a large portion of which must be stored in datacenters. With major drivers such as Google and others entering this arena, the proliferation of datacenters promises to challenge researchers developing models for inter-connectivity, robustness and sustainability. In response to this, a UC San Diego-led team of computer scientists and optical interconnection systems technologists in CIAN are developing SEED on novel optical interconnection technologies for a multi-stage network topology. SEED is an integrated solution encompassing physical layer hardware, protocols and topologies - while offering tomorrow's datacenters greater scalability, bisectional bandwidth, fault tolerance and energy efficiency.

According to CIAN Deputy Director Shaya Fainman, who leads the SEED project, "This integrated solution would accommodate the growing size and performance required of future datacenters, while minimizing the cost and energy per switched bit."

**Enhancing Student Exchange Experiences with High Definition Videoconference**

Monash in Australia and the UCSD division of Calit2 have added high-definition videoconferencing to their respective student-exchange programs, enabling transformative experiences for students and faculty that would not otherwise have been possible - earning the institutions CENIC's High Performance Networking Applications award.

HD video allows mentors at UCSD to attend final student seminars that are presented both to audiences at Monash and their mentors at UCSD concurrently. Thus, they receive feedback from both Monash and UCSD mentors, significantly enhancing the outcomes of their internship. Likewise, Monash students at UCSD present final seminars back to their mentors in Australia while presenting to a local audience at UCSD. The first groups of students to benefit from this use of HD videoconferencing were UCSD students spending last summer at Monash as part of the NSF- and Calit2-funded Pacific Rim Experiences for Undergraduates (PRIME) program. A similar program sent four Monash students to UCSD last winter under the Monash Undergraduate Research Projects Abroad (MURPA) program. Monash's program goes a step further by adding an advanced seminar scheme, in which students attend seminars given by world leading experts before they depart Australia. The seminar scheme is novel, because it makes it feasible to attract some of the world's best researchers "virtually" to Monash.

Monash's Chancellor, Dr Alan Finkel, wrote recently of his experience attending one of these seminars, "I've participated in numerous video conferences to date but nothing like this. The quality was so high that the experience was almost as if we were all in the same room."

**CENIC Awards**

The organization **eTranscript California** was honored in the Educational Applications category. It provides secure, streamlined electronic transcript exchange for 53 post-secondary institutions in the state (community colleges, California State University campuses, and many private and independent colleges).

This year's Gigabit/Broadband winner, **Rachelle Chong**, was cited for role as a Commissioner of the Calilfornia Public Utilities Commission at a time when CPUC allocated $100 million over two years to the California Advanced Services Fund (CASF). The CASF provides incentives to companies to bring broadband service to unserved and underserved areas of California, many of which are rural, remote or socio-economically disadvantaged communities. Chong was instrumental in the creation of the CASF in late 2007 and defining workable processes for implementation. "Without a broadband pipe to provide access to the Internet, these unserved communities will become `digital have-nots'," said Chong. "Policymakers and corporate leaders across the nation have been talking about the importance of deploying broadband infrastructure for years, yet this critical infrastructure is not available throughout the state. It is time to stop talking and finish the job." Chong left the CPUC in December 2009 and is currently Special Counsel of Advanced Information and Communications Technologies for the Office of the State Chief Information Officer.

Also recognized with the 2010 Outstanding Individual Contribution award was **Tom West**, former president of both CENIC (1999-2004) and, until October 2009, CEO of National LambdaRail (NLR). West has over five decades of executive management experience in the research and higher education community. He has served as a small college president, a vice chancellor for administration for regional campuses in a public university system, and 26 years as the Chief Information Technology Officer (CITO) for two large public university systems-Indiana University (1973-1981) and the California State University (1981-1999).

California's education and research communities leverage their networking resources under CENIC in order to obtain cost-effective, high-bandwidth networking to support their missions and answer the needs of their faculty, staff, and students. CENIC designs, implements, and operates the California Research and Education Network (CalREN), a high-bandwidth, high-capacity Internet network specially designed to meet the unique requirements of these communities, and to which the vast majority of the state's K-20 educational institutions are connected. In order to facilitate collaboration in education and research, CENIC also provides connectivity to non-California

institutions and industry research organizations with which CENIC's Associate researchers and educators are engaged.

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