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Two Technologies Tied to Rutgers Win R&D 100 Awards

Green process for producing concrete, software for managing Big Data earn the prestigious honor

PISCATAWAY, N.J. — Two technologies developed with contributions by professors and graduate students at Rutgers have been selected for R&D Magazine’s R&D 100 Awards. The prestigious honor, which is given for “revolutionary technologies newly introduced to the market,” spans industrial, academic and government-sponsored research.

One winner is a Rutgers technology licensed to Solidia Technologies of Piscataway that dramatically reduces carbon dioxide emissions in the production of cement and concrete products. The inventors are Richard Riman, Rutgers distinguished professor of materials science and engineering and Solidia’s founder, and Vahit Atakan, Solidia’s R&D director and a former doctoral student in Riman’s lab.

The second winner is ADIOS: Adaptable I/O System for Big Data, developed by a group including Manish Parashar, director of the Rutgers Discovery Informatics Institute and professor of electrical and computer engineering, with four of his graduate students.

Solidia’s patented technologies have the potential to reduce greenhouse gas emissions from cement and concrete industries by more than 70 percent. Requiring only modest changes to the processes currently used to make cement and concrete, Solidia’s process allows producers to better manage carbon dioxide, either by emitting less CO₂ during cement production or consuming it during concrete curing. The technology, which is more energy- and resource-efficient, makes solids out of packed powders without using a high-temperature kiln or furnace. The process has broad applications in the concrete and ceramics industries, producing innovative materials that offer greater strength and durability.

“This is very much a green process for numerous reasons, particularly because it requires far lower temperatures than the conventional method and it provides a new means for carbon sequestration,” Riman says. “We’re very pleased that the judges recognized its potential at the same time the marketplace is beginning to appreciate the value of the technologies.”
Solidia is marketing its process in the $1 trillion global concrete market and the $300 billion cement market.

“When Rutgers licensed these radically innovative patents, we had high hopes for their commercialization, and Solidia Technologies has proven to be an excellent partner for realizing these lofty expectations,” said Kenneth J. Breslauer, Rutgers interim vice president for research and economic development and Linus C. Pauling professor of chemistry and chemical biology.

“We are thrilled to see two technologies tied to Rutgers appear among the R&D 100 for 2013, particularly given the impressive nature of the scientific breakthroughs chosen this year and the history of previous winners succeeding in the marketplace,” Breslauer said. “Rik Riman and Manish Parashar are two outstanding Rutgers researchers. We are extremely pleased with this prestigious recognition.”

ADIOS is a collection of software services that is now being adopted by both commercial and academic users to manage big data for extreme scale computing for research in areas such as combustion, fusion and sub-surface modeling in oil and gas exploration. Rutgers’ primary contribution is “DataSpaces,” a software framework that provides essential services for managing and processing data produced by large-scale simulations, while addressing issues related to scale, performance, and energy costs. It essentially enables scientists to examine and query data while their large-scale simulations are producing it. ADIOS and DataSpaces are being used by a large number of applications.

“While, it’s fun to do the research, it’s good to see the work having an impact, and that’s why this recognition is extremely satisfying,” Parashar said. “It provides evidence that the research we’re doing at Rutgers is enabling new science and new insights in important areas.”

Parashar has collaborated with the project lead, Scott Klasky of the Oak Ridge National Laboratory, since they were post-doctoral fellows in 1994 at the University of Texas, Austin. Georgia Institute of Technology and North Carolina State University also contributed to the development of ADIOS. The Rutgers doctoral students who worked with Parashar on ADIOS are Hoang Bui, Tong Jin, Qian Sun, and Fan Zhang.

ABOUT RUTGERS
Established in 1766, Rutgers is America’s eighth oldest institution of higher learning and one of the nation’s premier public research universities. Serving more than 65,000 students on campuses, centers, institutes and other locations throughout the state, Rutgers is the only public university in New Jersey that is a member of the prestigious Association of American Universities. Rutgers was #1 nationally among public universities in terms of increased federal funding from FY2002 to FY2011, according to the NSF data. The university saw a 185% increase over those ten years, followed by Ohio State (177%), Georgia Tech (158%) and Purdue (142%).