

CITRIS: An Incubator of Green Tech Innovation

Wed May 6, 2009 3:12am EDT

Whether it's turning your cell phone into a crowdsourced traffic-monitoring tool or developing technologies to allow home thermostats to talk to your electric utility, CITRIS -- the Center for Information Technology Research in the Interest of Society -- is an incubator of some cool green innovations.

The center, which brings together more than 300 faculty researchers from four campuses in the University of California system -- U.C. Berkeley, Santa Cruz, Davis and Merced -- operates with the goal of shortening the distance between research projects conducted on-campus and their being put to use on the market.

"As an arm of the University of California, our mission is to develop and put technology - whether in energy and the environment or in health care and social services - to use on a scale that it will enhance many people's lives," CITRIS director wrote recently in an op-ed in the San Francisco Chronicle.

"Where Research Meets the Marketplace"

CITRIS launched in 2001 with seed money from the state of California under the condition that it raise \$200 million more from industry partnerships, recently unveiled its brand new facilities at U.C. Berkeley, where it will bring together faculty from engineering, biology, chemistry, policy, law and other disciplines to develop world-changing technologies.

CITRIS faculty and students, along with staff from semiconductor company Marvell -- a major funder not just to CITRIS but to the development of the headquarters itself -- invited members of the press for a tour yesterday to get an overview of the work that CITRIS has already done, and what it's working on in the future.

Weili Dai, a co-founder of Marvell, welcomed reporters to the tour, explaining why the center's mission is so important: Simply coming up with cool new gadgets for entertainment or information is "not sufficient; our next wave is how do we apply these great technologies to add value to human needs?" she said. The beauty of the projects underway at CITRIS, she said, is that "these innovations are not just good for the environment, they're good for the marketplace."

Case in point: the new Nano Lab at CITRIS headquarters is the latest incarnation of the Microfabrication Laboratory, which CITRIS director Paul Wright described as having provided technology support for 76 start-ups in the Bay Area in recent years, creating over a thousand jobs and bringing in hundreds of millions of dollars in funding and revenue to the area.

Cell Phones As Traffic Monitors

The Mobile Millennium technology in action One of the inventions showcased yesterday highlights the potential impact of CITRIS's work. The Mobile Millennium project aims to turn the ubiquitous cell phone into a sophisticated traffic-monitoring device.

A partnership between CITRIS researchers, cell phone giant Nokia and mapping company Navteq, the project lets owners of GPS- and Java-enabled cell phones to download a simple application that sends information back to servers that can broadcast real-time traffic information on the web.

The group found that, with just 2 percent of drivers on a given stretch of

road using the software, the Mobile Millennium technology can out-predict the expensive (and often outdated) traffic-monitoring infrastructure put in place by transportation agencies.

Dan Work, one of the researchers on the project, explained that privacy is baked-in to the system: "We don't want to know how any given driver is driving, or where he's going," he said; the system just needs to know how the anonymous crowd as a whole is passing through an area.

The software is downloadable from traffic.berkeley.edu, as well as a list of currently supported phones for the software.

Thermostats that Talk

The other key green technology on display at CITRIS HQ yesterday was a smart thermometer brought to market by Golden Power Manufacturing. The programmable thermostat can be enhanced with up to two modules that can communicate with anything from smart appliances in your home, to your electrical utility when demand on the grid is high, to you yourself, if you want to turn down the air conditioning remotely.

The Golden Power Thermostat. Tim Simon, the founder of Golden Power, explained the benefits of this kind of smart thermometer: on those hot days of summer, when everyone leaves their offices and drives home to crank up their air conditioning, the demand on the grid can force rolling blackouts to conserve power. But these thermometers can avoid that problem.

"Air conditioning uses one-third of the power during those hot days," Simon said. "In an emergency, raising the temperature in a house from 70 to 74 degrees, for example, would solve the problem."

The smart thermometers can be programmed to communicate with utilities, receiving information about the level of demand on the grid, and set energy use within the house accordingly. This kind of research, Simon said, can be done best at universities, which is why it's a perfect project for CITRIS.

"The advantage for a place like Berkeley is that they don't have the time pressure where they have to make money," he said. "Working with Berkeley gives us the ability to commercialize products based on the work that the Berkeley students and faculty have done."

From R&D to R&D&D

Shankar Sastry, the dean of U.C. Berkeley's College of Engineering, described the model that CITRIS is developing as the next generation of R&D: Research, Development and Deployment, or "R&D&D."

The deployment end of the process, Sastry said, "can break down the ivory tower," making it so that research and publication are the only goals for faculty, and bringing their skills to bear on real-world problems, creating real-world solutions.

A full list of CITRIS projects is available online; we'll be bringing you more about where the center is putting its efforts in the coming weeks.

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