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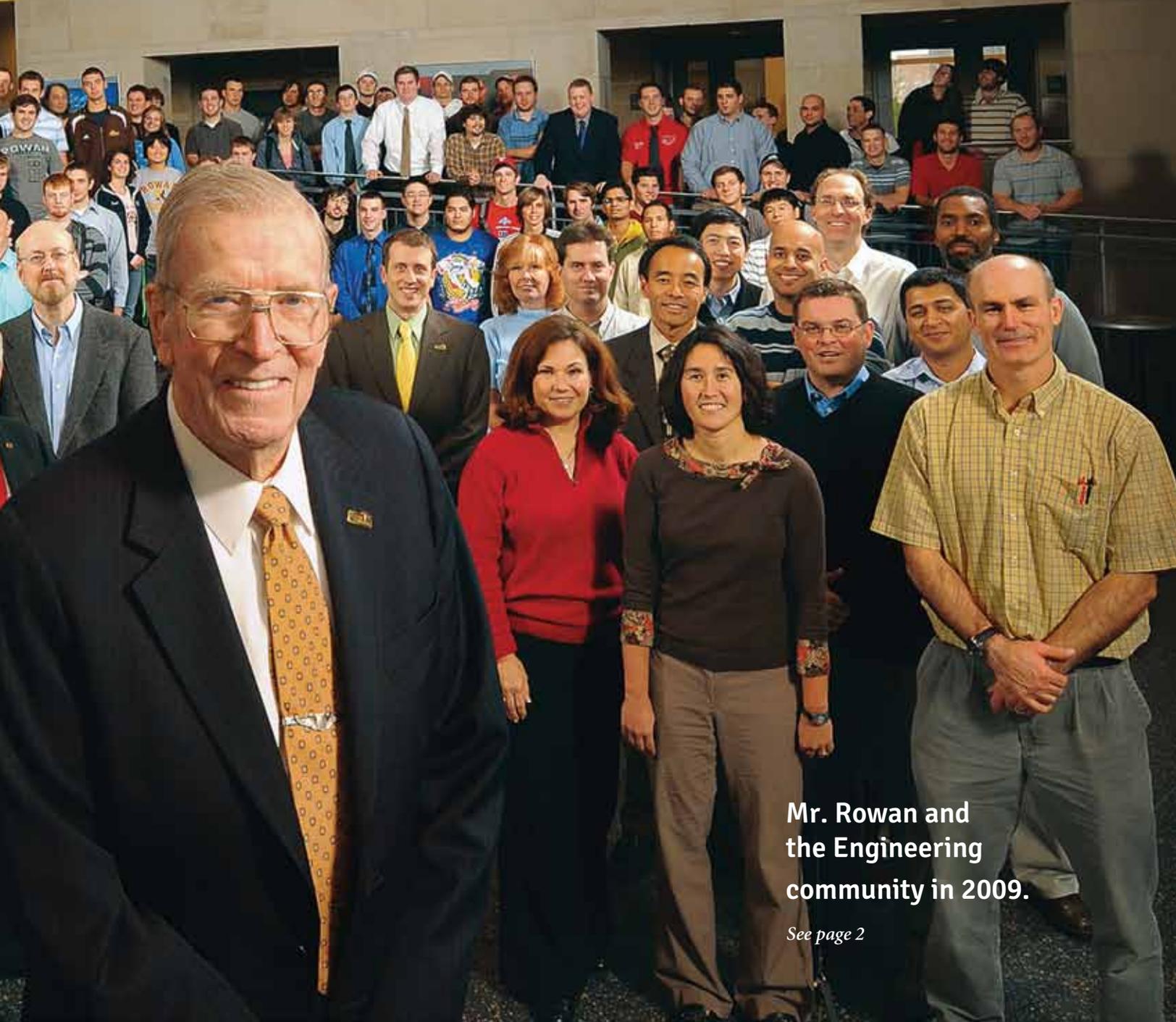


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Engineering News

HENRY M. ROWAN COLLEGE OF ENGINEERING



**Mr. Rowan and
the Engineering
community in 2009.**

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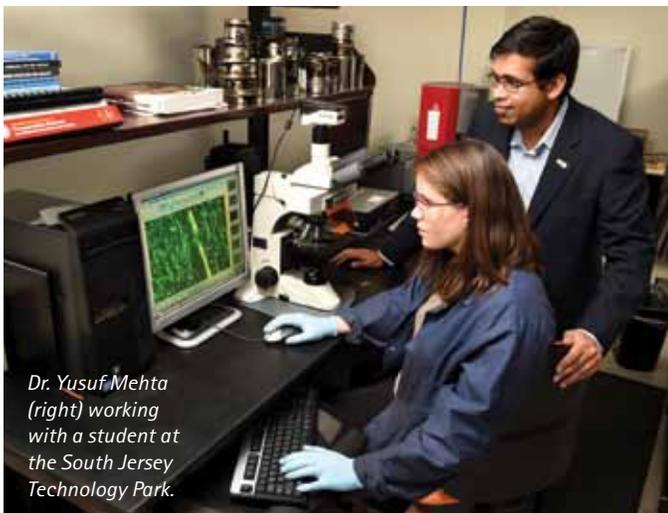
Rowan team contributes to safer roadways

As drivers head to work and back home, they can thank Dr. Yusuf Mehta for helping make the journey a safe one. Mehta and his team of Rowan students are collaborating with researchers from across the country to study the asphalt pavements people travel every day. Their aim is to transform the science of pavement engineering to help build high-performing, environmentally friendly roadways, while saving taxpayers money in the process.

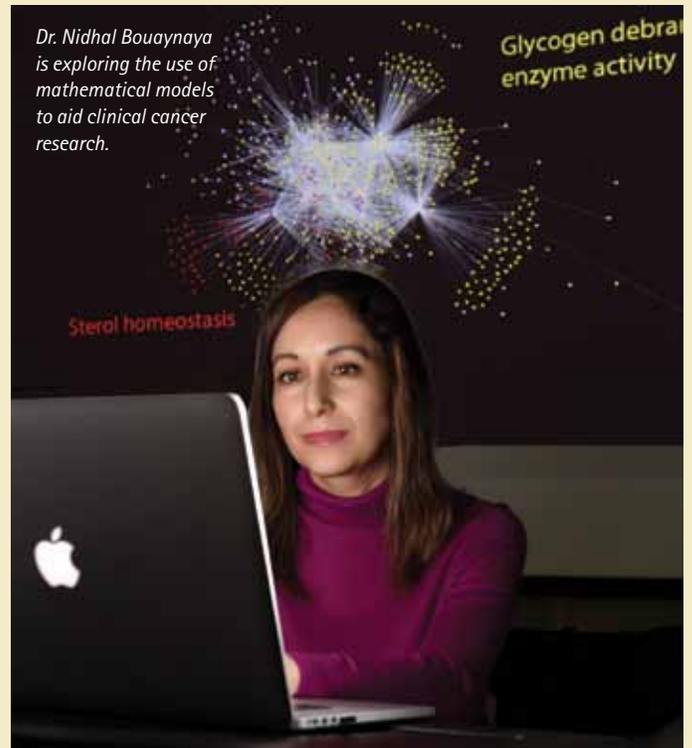
Mehta, who oversees an asphalt lab in the South Jersey Technology Park in Mantua Township, New Jersey, is studying the environmental impacts of recycled asphalt pavement under a \$452,490 grant from the New Jersey Department of Transportation (NJDOT). His research team, which also includes investigators from Columbia University and Stony Brook University in New York, is working to identify all non-roadway applications, including aboveground applications, for the reused asphalt that are safe for people and the environment and comply with federal and state environmental guidelines.

In fall 2013, the NJDOT also awarded Mehta \$450,000 to investigate alternatives to nuclear density testing of soils, a common but expensive quality control process during construction. In nuclear density testing, engineers use gamma rays to determine the density of a material. An optimum density is critical to achieving better-performing roadways. Because nuclear density contains numerous risks, the procedure is riddled with logistical issues, which in turn are associated with high financial costs.

If a more cost-effective alternative were discovered through Mehta's lab and field evaluations, his research could prevent the additional spending and difficulties associated with this type of testing. "Nuclear density testing has strict protocols of usage," said Mehta, associate professor in the Department of Civil & Environmental Engineering. "The NJDOT wants to find an alternative that is repeatable and accurate. It is willing to explore all options and has kept a very open mind."



Dr. Yusuf Mehta (right) working with a student at the South Jersey Technology Park.



Research combines engineering and biology to improve health care

The dynamic field of system biology involves the computational and mathematical modeling of complex biological systems. This emerging engineering approach is being applied in novel ways to enhance biomedical scientific research and improve patient treatment. At Rowan, Dr. Nidhal Bouaynaya, assistant professor of electrical and computer engineering, is breaking new ground in this innovative discipline. Her research is focused on the application of mathematics and statistics to tackle nonlinear, multidimensional biological problems.

Under a \$1.2-million grant from the National Institutes of Health, she is studying problems related to the systems biology of cancer, with emphasis on the dynamics of molecular networks. Her most recent work relates to mathematical modeling and control of genetic regulatory networks, in order to force them away from undesirable cellular states, such as metastasis, and into desirable ones. Cooperating with her are researchers from the University of Alabama-Birmingham School of Medicine and the University of Illinois at Chicago.

"Our goal is to use mathematical models to examine the dynamics of genetic networks and better hypothesize what genes are causing cancer," said Bouaynaya. "This ultimately will contribute to the development of enhanced biological markers in clinical cancer research."