A parametric interface that reacts and changes based on user input.

Alex Merlucci, a student in Associate Professor Darius Sollohub’s studio, was one of a group tasked with designing a new generation of practical, affordable, energy-efficient townhouses for Habitat for Humanity, Newark. His modern, cost-effective design with customizable exterior and interior elements was selected for development, and he continues to work on the project as an intern to the architect of record. Habitat’s Newark chapter plans to break ground for Alex’s townhouses during 2011. The project also won the grand prize for 2010 from the National Council of Architectural Registration Boards (NCARB).

Matthew Gosser, gallery director at the College of Architecture and Design, created “Theater Town,” a huge outdoor mural on the rear wall of 441 Broad Street depicting theaters that once enlivened Newark’s cultural life. The unveiling of the mural coincided with a similarly-themed art show held at NJIT last fall, “Theater Town,” the show, co-sponsored by the Newark Arts Council and curated by Gosser.

**DESIGNING SUSTAINABLE SYSTEMS**

Sustainability has long been a commitment at NJIT, even before the 1989 opening of the Otto H. York Center for Environmental Engineering and Science, the first building in the nation especially constructed for cooperative public and private research in hazardous waste management. The new strategic plan encourages teaching and research programs that apply sustainability principles to building and design, manufacturing, transportation and other fields.

High-performance, sustainable buildings, particularly housing and schools are the concern of Deane M. Evans, research professor of architecture and executive director of the Center for Building Knowledge. He directs a U.S. Department of Energy-funded project to create a comprehensive series of four courses to teach mechanical engineers in the New York Metropolitan Region how to improve the energy efficiency of existing buildings. He is also the NJIT director of a collaborative project with Building Media Inc., a DuPont subsidiary, also supported by the DOE, to develop innovative energy efficiency strategies that can be applied to American homes.

Kamlesh Sirkar, distinguished professor of chemical engineering, is known internationally for his pioneering research in membrane separation technology, widely used in the chemical, food, petrochemical, pharmaceutical and biotechnology industries to separate, purify or concentrate liquid solutions, cellular suspensions or gaseous mixtures. He directs the newly-established Center for Membrane Science, Engineering and Technology Composites, an NSF Industry/University Cooperative Research Center in partnership with the University of Colorado at Boulder. Research at the new center will focus on environmental issues including desalination of seawater to produce pure, potable water using an innovative membrane-based desalination technique developed by Sirkar. Boris Khusid, professor of chemical engineering, is co-PI of...
The new strategic plan encourages teaching and research programs that apply sustainability principles to building & design, manufacturing, transportation and other fields.

Michael Jaffe (above), research professor of biomedical engineering, gained a patent for a new epoxy resin derived from corn sugar developed in partnership with the Iowa Corn Promotion Board. The new polymer may be able to replace bisphenol A, a product linked to health problems, in adhesives, paints, and the coatings that line food tins.

Mike Lowry (right), mechanical engineering student, won the 2010 American Society of Mechanical Engineers Design Competition for District A with his recycling robot called "RUFUS."
the center.
The application of geospatial data and technology to a variety of environmental problems is the specialty of Sima Bagheri, professor of civil and environmental engineering. She uses time series analysis and visualization of ocean color data combined with biooptical and statistical modeling to understand the impact of climate change on freshwater/estuarine systems throughout New York and New Jersey. Her expertise earned her an invitation to participate in the prestigious 8th Annual National Academies Keck Futures Initiative sponsored by the National Academy of Sciences, the National Academy of Engineering and the Institute of Medicine. She presented on “The Impact of Global Change on Nearshore Water Quality — A Remote Sensing Approach.”

Michael Jaffe, research professor of biomedical engineering, gained a patent for a new epoxy resin derived from corn sugar developed in partnership with the Iowa Corn Promotion Board. The new polymer may be able to replace bishenol A, a product linked to health problems, in adhesives, paints, and the coatings that line food tins. He also leads the NSF-sponsored Inter-American Materials Collaboration with Universidad Nacional Autonoma de Mexico, created to develop new backbone chemistries for very high performance fibers, films and plastics incorporating renewable resource monomers derived from common agricultural crops.

Mike Lowry, mechanical engineering student, won the 2010 American Society of Mechanical Engineers Design Competition for District A with his recycling robot called “RUFUS.” The “Earth Saver” competition involved designing a robot to sort various types of recyclables. He will travel to Vancouver, B.C., to compete in the finals.

Rima Taher, university lecturer in architecture, specializes in best building design and construction practices for reducing wind pressures on building surfaces and resisting high winds and hurricanes in residential or commercial construction. She was invited by Architecture for Humanity to join architects and engineers to create a construction guide for rebuilding in earthquake and hurricane-prone areas. The guide, which will be used as a resource for builders in Haiti, will cover job site safety, the dos and don’ts for earthquake and hurricane-resistant construc-

Sima Bagheri (left), professor of civil and environmental engineering, uses time series analysis and visualization of ocean color data combined with biooptical and statistical modeling to understand the impact of climate change on freshwater/estuarine systems throughout New York and New Jersey.

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Alternative Energy Solutions

An invention by Somenath Mitra, professor and chair of chemistry and environmental science, was cited among the top five advances in solar technology by gogreenstaygreen.com. He developed an inexpensive solar cell that can be painted or printed on flexible plastic sheets that use a combination of carbon nanotubes and carbon buckyball molecules to create a series of snake-like patterns that can conduct energy.

Ken Chin, professor of physics, directs the newly-created Solar Cell Research Center, supported by Apollo Solar Energy, Inc., of Chengdu, People’s Republic of China. The center’s research will focus on improving applications of cadmium telluride semiconductor materials used in thin film solar cells. Apollo Solar Energy mines and refines tellurium and high-purity tellurium-based metals for the global electronics market.