

MECHATRONICS MANIA

NATIONAL SCIENCE FOUNDATION SELECTS NYU-POLY'S GROUNDBREAKING ROBOTICS PROGRAM FOR PRESTIGIOUS WASHINGTON, D.C., EXPO

Having demonstrated that robots can effectively teach math, science and engineering to Brooklyn youngsters, NYU-Poly took its message to a national audience in Washington, D.C. on October 23 for the inaugural USA Science and Engineering Festival Expo on the National Mall.

The NYU-Poly exhibit, "Mechatronics Mania," was one of only 15 chosen by the National Science Foundation (NSF) as part of its display for the grand finale weekend in a two-week celebration designed to re-invigorate youngsters' interest in science, technology, engineering and mathematics (STEM).

Led by Vikram Kapila, associate professor of mechanical engineering and one of the founders of NYU-Poly's successful robotics and mechatronics outreach program, and Magued Iskander, associate professor of civil engineering, NYU-Poly team members used small robots to demonstrate techniques that have raised the letter grades and skills of students in Brooklyn's economically disadvantaged neighborhoods.

The robots are no substitutes for teachers. Instead, teachers and NYU-Poly doctoral fellows employ the kid-friendly robots

to encourage students to learn the math and science that they will need to succeed in STEM subjects and careers. "Well before college, students must learn abstract algebraic and statistical concepts; they must be able to interpret graphs, solve problems and understand measurement methods," Kapila said. "These seem to be unrelated to their everyday experiences...until they try to perform simple tasks with a LEGO robot."

In 2007, two members of what is now the Brooklyn Community Foundation urged NYU-Poly's Kapila and Noel Kriftcher, former executive director of the David Packard Center for Technology and Educational Alliances, to create the Central Brooklyn Robotics Initiative (CBRI) and provided seed funding. Today, CBRI and a companion Graduate K-12 (GK-12) Fellows program supported by the NSF pairs teachers from 18 economically disadvantaged elementary, middle and high schools with doctoral fellows from NYU-Poly's engineering programs to design dynamic, hands-on classroom lessons.



NYU-Poly fellows and teachers spend summer recesses training in mechatronics and robotics, developing research and hands-on lessons. When school resumes, the fellows and teachers continue their partnership, bringing robotics projects to life with students and exposing them to tools and techniques used by scientists and engineers.

CBRI has a profound and measurable impact on students, according to the program's external evaluation. For example, in spring 2010, teachers reported changes in letter grades for 810 students during or directly following the program; 74 percent of students saw their overall grades jump one-half or one full letter grade and 80 percent saw their science and math grades improve one-half or one full letter grade. Students reported educational and emotional benefits from the program, ranging from increased interest in science and technology (77 percent) to improved listening skills (83 percent) and finding a role model in the NYU-Poly fellows (80 percent). The CBRI program also helps reduce the isolation of minority students through robot design contests, in which they compete against students from unfamiliar communities as well as participate with them in informal learning experiences.

In addition to the Brooklyn Community Foundation, CBRI is supported by The Black Male Donor Collaborative, Motorola Foundation, JPMorgan Chase Foundation, NY Space Grant Consortium and Alliances for Graduate Education and the Professoriate. The program is synergistic with a five-year program at NYU-Poly funded by the GK-12 Fellows program of the NSF to broaden graduate engineering education and provide fellows with teaching, communication, pedagogical, management and team-building skills.

In Washington, Kapila and Iskander, along with NYU-Poly students and Brooklyn teachers, demonstrated to expo visitors the mathematics, engineering and science behind their robots. The teachers are Cluny Lavache of Bedford Academy High School and Noam Pillischer of Urban Assembly Institute of Math and Science for Young Women. Representing the NYU-Poly fellows are Nicole Abaid, doctoral candidate, mechanical engineering; Jennifer Haghpanah, doctoral candidate, chemical and biological science; Carlo Yuvienco, doctoral candidate, biomedical engineering; Ryan Caeti, master of science, mechanical engineering; Jared Alan Frank, master of science, mechanical engineering; and David Lopez, bachelor of science, mechanical engineering.

TRUSTEE MARIO CARDULLO HOLDS RECEPTION HONORING PROFESSORS KAPILA AND ISKANDER

At an intimate reception at the Alexandria, VA home of Trustee Mario '57 '59ME and Karen Cardullo on October 22, President Jerry Hultin congratulated Professors Vikram Kapila and Maged Iskander for their exemplary work in Brooklyn elementary and secondary schools. Hultin praised the faculty members' K-12 robotics program, noting that they continue NYU-Poly's legacy of developing the STEM talent pipeline while bringing social mobility to economically disadvantaged students.

At the reception—which included 25 friends, alumni and trustees—NYU-Poly graduate students Jennifer Haghpanah and Jared Frank demonstrated the future “smart home,” a model outfitted with intelligent sensors. Hultin seized the opportunity to thank the program's major donors: Philip Li of Brooklyn Community Foundation, the lead donor with a new gift of \$500,000; and Nicole Sharpe of the Black Male Donor Collaborative, a new donor with \$100,000. Two other program funders, Motorola Foundation and JPMorgan Chase Foundation, were unable to attend the D.C. festivities. Dr. Sonia Ortega, representing the NSF, was delighted that Kapila attracted more than \$1.2 million of private support in addition to \$3 million in federal funding.



From left: Philip Li, chief operating officer, Brooklyn Community Foundation and Professor Kapila; and Nicole Sharpe, director, Black Male Donor Collaborative and President Hultin.

