

NJIT A TOP GRADUATE SCHOOL FOR ENGINEERING FOR THE 17TH STRAIGHT YEAR

U.S. News & World Report has released its 2021 rankings for the nation's top graduate schools, with NJIT ranked among the best for graduate degree programs in engineering. The university moved up two slots this year to No. 87 — up 24 slots in the past five years — and has been included on the distinguished list since 2003.

NJIT's Newark College of Engineering, which celebrated its centennial in 2019, offers a range of master's and Ph.D. degree programs. In recent years the college has greatly expanded its laboratory, hands-on and experiential learning components, increased student access to state-of-the-art physical and computing machinery, and geared its curriculum to extensive utilization of this technology — all of which reinforce the

university's reputation as one of the country's best graduate engineering schools.

"Newark College of Engineering has consistently received many accolades over the years for offering high-caliber graduate programs taught by faculty who excel in teaching and research," said Sotirios G. Ziavras, vice provost for graduate studies and dean of the graduate faculty at NJIT. "The *U.S. News* ranking of its graduate programs is once more a testament to its success."

The rankings are based on peer assessments of academic excellence

from deans of engineering schools and graduate studies, and quality assessments from recruiters of engineering school graduates. *U.S. News* also considered statistical indicators that measure the quality of a school's faculty, student-faculty ratios and school selectivity in accepting applicants. The collected data came from statistical surveys of more than 2,081 graduate programs, and reputation surveys sent to over 24,603 academics and professionals in the featured disciplines.

NJIT is one of only four universities from New Jersey ranked in the Top 100. ■



AN AMPUTEE ACQUIRES A PROSTHETIC FINGER FROM AN NJIT CAPSTONE TEAM

After a table saw severed the top of his right index finger, Adam Zanellato, a 20-year-old cabinet-maker at the time, had to relearn basic hand maneuvers, such as how to write and hold a fork. There were no affordable prosthetics on the market to help him regain dexterity. Several years later, he still found it hard to pick up coins from a table.

A year and a half ago, he decided to restart his search, and began by contacting a friend in medical school for leads. The woman, an NJIT graduate, made this recommendation: present himself as a research project to

students in the university's biomedical engineering department, which has a strong focus on rehabilitation. She contacted Sergei Adamovich, the director of NJIT's Center for Rehabilitation Robotics, who agreed to supervise a team with the help of Ashley Mont, a third-year Ph.D. student who specializes in robotic exoskeletons.

A team of four — Ricardo Garcia, Ashe Pignataro, Madison Taylor and Giovanna Nolan — quickly agreed to make it their senior capstone project and promised Zanellato that they would build him a prosthetic finger.

"With our specialized technologies and printing capabilities, the possibilities for design and customization are endless," Mont noted, adding, "I had worked with each of these students and knew that if any team of undergraduates could succeed, they could."

"This was not a theoretical exercise. We wanted to make sure our prosthetic was

functional — that Adam was able to grip with strength and dexterity, hold utensils and even some tools, while also being able to lift small objects," said Garcia, the project leader, adding that the team submitted their project for review by the university's Institutional Review Board to develop a legal framework for where and how the device could be used. Four visits to campus and 10 prototypes later, Zanellato now wears it at home for simple tasks.

Their finger, which features an artificial interphalangeal (hinge) joint system, uses the force generated by the remaining part of the finger to power it, thus mimicking normal finger flexion and extension. To make it affordable, they developed a method for manufacturing it with a 3D printer, using strong but inexpensive materials.

"In terms of design, a key challenge was making sure that it could be easily reproduced if damaged by simply



One of Meza's tables decorated with slime mold. He also wants to explore construction techniques.

Daniel Meza, Hillier College's First Fulbright Scholar, Works in Slime Mold

Students applying for Fulbright scholarships often see their work described as advanced, insightful, sophisticated or any number of similar platitudes — but for senior industrial design major Daniel Meza, the word was also slimy.

Meza, who plans to graduate in December from Hillier College of Architecture and Design and who's also an Albert Dorman Honors College student, found his medium in mold and slime. He is just the fourth NJIT student to become a

Fulbright Scholar and the first from HCAD.

"You're not missing anything," the Randolph, N.J., native explains to people who question if they heard that correctly. "Two years ago I had a design studio. It was experimental furniture. One of my best friends mentioned slime mold because I was talking about moss furniture."

Meza said he found other artists and designers around the world who use mold and slime in photography and prints, but he doesn't know of anyone using it for furniture. His current work uses the natural materials for decorative purposes, but he really wants to merge the materials with a form of plastic for actual construction elements.

So far he's worked on a lamp, stool and table. He also wants to work on lights as well as seats.

The scholarship will take him to Macquarie University in Australia in January 2021, where he'll develop a method for creating furniture out of slime mold. He applied for 10 months of study and was surprised when the scholarship committee awarded him two years.

"I first met Daniel in an advising meeting and he told me about his design work, including the slime mold table. I was intrigued and, to tell the truth, a little grossed out at first," said Lorna Ronald, associate director in the Honors College, who manages the fellowship program at NJIT. "I asked to see it and, like Daniel, thought the vibrant yellow slime mold was incredibly beautifully incorporated into the design of the table."

Research at a university like NJIT is typically associated with beakers and coding, not art and design. But it's open to all students. "I love hearing about unique and unusual interests. Students often feel very bound by the careers that they have planned for themselves — when there are in fact a greater number of options for them. My job in advising for fellowships is to help students come to know themselves very well so that they can see clearly where their real passions lie and imagine ways to pursue them," Ronald said.

Meza agreed — "As a designer, I didn't really think there were opportunities for me to do research or get grants," he said. "I'm so thankful for the faculty and staff who told me about this opportunity." ■

reprinting a part," Taylor noted.

"Our goal was to make it look more and more like a finger without sacrificing the mechanics," Nolan said. Pignataro added, "Every tweak to the geometry has a story behind it. When it was pinching, we added a curve."

Their invention won first prize in the university's undergraduate TechQuest Challenge on Innovation Day last year. It has since acquired a name — The DeXter — and a professional description: "a body-powered finger prosthetic for subjects with amputations distal to the proximal interphalangeal joint." The team recently filed a patent on their invention through NJIT and is seeking to commercialize it.

"It's very unusual that students have the chance to design a prosthetic for a specific person," Adamovich said, "but that's what made this project so exciting." ■



Ricardo Garcia and Madison Taylor hold the prosthetic finger they developed for their senior capstone project last year.

'Shark Tank' Gives Deals to Professor, Alumnus of Industrial Design Program

An adjunct professor and an alumnus, both affiliated with Hillier College of Architecture and Design, recently earned funding for their startup companies on the television show *Shark Tank*.

Professional designer and instructor Krystal Persaud took in \$150,000 for her solar charging products, while alumnus Ryan Cruz saw his footwear company get \$200,000. The show, which airs Friday evenings at 8 p.m. on ABC, features entrepreneurs competing for investments from celebrity judges who themselves are high-profile business executives and entrepreneurs. The show debuted in 2009, and with the publicity and exposure to investors watching the pitches, it has been a wildly popular showcase for entrepreneurs ever since.

Prior to launching her solar company, Persaud worked as a professional designer of educational toys, while also teaching courses in interactive design, product design and sustainable design at NJIT's Hillier College and other design schools in the New York metro area. Her company is called Grouphug.

"In college, and for the past 15 years, I've been really interested in the environment and sustainability. The one area that felt really impossible was solar, because I live in the city and I don't own my roof," she explained. Then, "I went down a rabbit hole one day and was researching renewable energy," Persaud said. "It started with the idea that every person can make some kind of impact and we're all in this together," hence the name, Grouphug.

She learned that solar panels come in different sizes and shapes, not just large rectangles found on roofs, such as the kind being installed on top of NJIT's Wellness and Events Center.

Working out of her office in Brooklyn, N.Y., Persaud started acquiring and making parts until she had a viable prototype. She raised \$70,000 in a crowdfunding campaign and produced a stylish home charger, which is about the size of a laptop and hangs inside a window, and sells for \$150. It holds

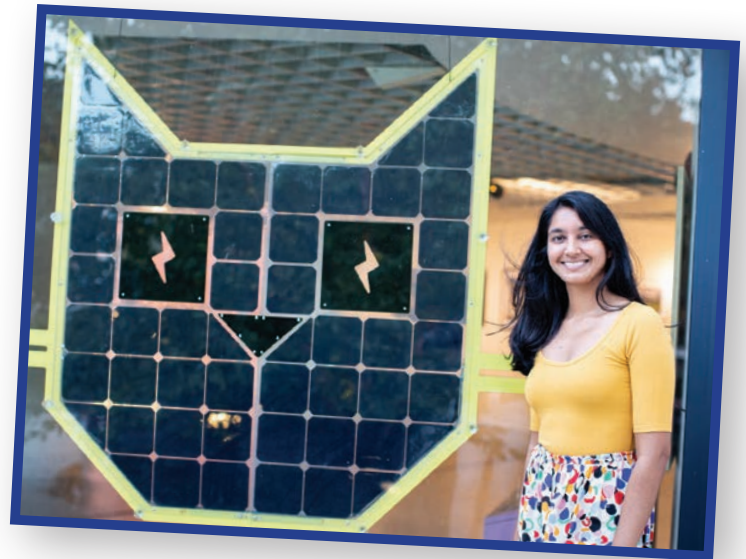
3.4 amps, which is the size of the battery in a high-end smartphone or pocket-sized backup battery. Grouphug also offers a commercial solar charger, which Persaud said is in the pilot-project stage. That product is a 150-watt charger, compared to 10 watts in the consumer edition.

Shark Tank producers contacted Persaud after seeing her Kickstarter video. The show aired 10 months later. She said there were 200 pages of paperwork, which required even more time and dedication beyond what she gives to her business, without any promise of even getting on the show. After the episode is filmed, it still takes a few months and meetings to get the funds. But she found the process more satisfying than seeking venture capital.

Technology investor and basketball owner Mark Cuban provided her funding through the show. Now she has venture capitalists calling on a regular basis. Persaud is not interested, though — she'd rather grow the company based on feedback from customers.

"Mark has been extremely available and willing to give advice, make connections and hop on the phone," she said. "At first it was weird. After a while you get kind of used to it. The one thing that surprised me and was really great about Mark is, he was very open to it and actually came to my office in New York and sat down for an hour. He was open to the vision and we talked about it before we actually signed anything. He always tells startups and he told me this, don't chase shiny objects. Chase customers."

Cruz, who received a bachelor's degree in industrial design in 2014, prefers wearing slippers at home and stumbled onto an idea. "I had to walk the dog, I had to take the trash out, and every time I did that, I didn't want to tie shoes and put socks back on," he explained. So, he came up with a design for a convertible shoe. "It's a slipper that you can take outside with you. It's an indoor slipper that, if you're able to go on a



Grouphug makes home and commercial solar charging products.

quick trip outside, you slip on outsides."

He used the idea for his senior thesis and couldn't stop thinking about it after school. He and his brother Eric, along with their friend Kevin Zamora, eventually left their day jobs, learned by making mistakes and finally met a footwear consultant who showed them how it's done. They formed Muvez Footwear in 2016. Cruz is the designer, his brother handles the business operations and Zamora does marketing.

"The only problem is limited resources and limited financing, so it was tough to get it off the ground," Cruz observed. His company developed different outsoles for style and function, using rubber molds of Eric Cruz's foot. They received more than \$30,000 through their Kickstarter campaign, received additional angel investing from NJIT alumnus Patrick McGowan '88, and filmed their *Shark Tank* episode in August last year after passing their audition. During this time they sold about 1,000 pairs of their shoe-slipper hybrid. His funder on the show was Fubu footwear founder Daymond John.

Cruz and Persaud both have advice for current students. "Knowing it's all on me made it easier to transition to being an entrepreneur," Cruz said. "In my program it was very flexible. They let you have the freedom to create whatever you wanted."

As for Persaud, she looks to teach one class each fall and said she finds it helpful to hear fresh perspectives from students. "Being part of that cycle of educating designers, and seeing and inspiring them about what they could actually make ... I think getting more of them to be entrepreneurial would be beneficial," she said, encouraging students to utilize the tools and opportunities education provides to achieve their startup goals. ■