

# MAKING IT HAPPEN

## 2013 GRADS AREN'T JUST CRACKING TEXTBOOKS— THEY'RE LAUNCHING THEIR CAREERS

BY SARAH ZOBEL

**A**lexander Yang '13 is helping to bring hands, fingers and arms to the United States—functional prostheses that are made using a 3-D printer, some string, a little elastic and a few screws. At roughly \$100 each, they are a low-cost alternative to higher-tech, electronic versions, which can cost as much as \$40,000 a piece.

“It’s purely mechanical, which is the beauty of it,” says Yang, who spent his summer in South Africa working alongside native Richard van As, a carpenter who lost part of his right hand in an accident and invented “Robohand” to replace the severed digits. Robohand, Yang says, is especially popular among children, who find it intuitive to use—lift the hand’s stump up or down, and the momentum of that action moves the strings and pulleys, causing the fingers to clamp down or release.

In a country where landmines have severely injured many citizens, Robohands have been eagerly welcomed in South Africa; some 800 are already in use, and there’s a waiting list about 500 names long, according to Yang. Hoping to help generate interest in the United States, he has signed on as something of a sales representative, and plans to introduce Robohand to U.S. hospitals, prosthetic centers and regulatory agencies. Somehow, he’ll fit that in among his classes at Harvard, where he’s currently a sophomore, and the 25 hours a week he works at the university’s Wyss Institute for Biologically Inspired Engineering.

Yang and his classmates are defined, in part, by the access to technology they have enjoyed since childhood and by growing up in a global society that is increasingly connected. Studies reveal that a majority of adolescents and young adults today (often defined as millennials and, increasingly, Gen Z) are interested in becoming entrepreneurs. They have the drive and desire to build their

own businesses or organizations, and access to the tools—social media and crowdsourcing, for instance—to make it happen. And many of them are taking these leaps with a social mission in mind. They are members of a generation marked by its collaborative nature; by greater tolerance of racial, sexual and generational diversity; and by being community oriented. Raised in a post-9/11 digital world, these adolescents and young adults are in many ways more sophisticated than earlier generations were at the same age.

In his 2013 Commencement address, Principal Has-san told graduates, “You are a highly connected, firmly rooted and deeply compassionate class.” Yang, the class president, certainly serves as a model for that, as do classmates Jameel Mohammed and Nandini Mullaji and the dozens of other Exonians who are using their college years as early entry points into what John Phillips had defined as “the great end and real business of living.”

## ENTREPRENEURIAL CREATIVES

Penn might not seem like a hotbed for fashion design, but as the only Ivy to host a designated fashion week, it’s not so far off. And for sophomore Jameel Mohammed, with internships at the houses of Nicole Miller and Narciso Rodriguez already under his stylish belt, it’s a good place to prepare for the business. With the recent launch of a new line of jewelry first conceived of during his time at Exeter, Mohammed is already making a name for himself.

A two-year Exonian, he started sketching fashions during his sophomore year of high school in Chicago. In the summer of 2011, just before transferring to Exeter, he attended an Oxbridge Academic Program in Paris, where he mentioned his interest in design to the director, who then invited Belgian designer Pierre Antoine Vettorello to teach a three-day mini-course. When Mohammed met with an Exeter counselor at the end of his upper year to discuss his future, he was intrigued to hear that Bud Konheim ’53, CEO of Nicole Miller, was looking for a summer intern.

That internship was a fruitful experience for Mohammed, who was allowed to take part in the entire design process and spent the summer sourcing materials from New York’s garment district, researching art history for

inspiration and dying “a lot of trim.” He even had the opportunity to design for Miller herself, and got a couple of his own pieces into the early stages of production.

“That was the experience that made me sure that I wanted to go into the business,” Mohammed says. He would parlay it into another internship after graduation, this time with Narciso Rodriguez, where he worked for Casey Cadwallader '97, the house's design director.

Perhaps Mohammed's biggest splash to date was his senior project at Exeter, a runway show featuring his own designs. After many sewing all-nighters, the event, titled “Modern Subversion” for the subtly unorthodox elements in the

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designs, showcased a half-dozen of his pieces that could be mixed and matched. It was held in the Lamont Gallery, with a runway lined with chairs, and catered like something out of New York's Fashion Week.

“I think that in the creative professions, when you have an idea you want to realize ... the idea is so great in your head, it's scary,” he says. But the senior project “gave me the confidence to say, ‘Here I am, these are the resources that I have, and I'm going to do the best work that I can with





these resources.’ It all started at Exeter, with being empowered to go for it.”

Mohammed, who founded the Penn Fashion Industry/Entrepreneur collective, designs exclusively for women, citing as influences Phoebe Philo, creative director at Céline, and Dries Van Noten. He’s now focusing almost exclusively on Khiry, his new line of luxury accessories, and hoping to get them into stores soon. His bracelets and necklaces had their genesis in a couple of pieces he created at Exeter as part of his senior project show; the originals were made of polyester rope that Mohammed elaborately knotted—and then forgot, in all the hubbub, to put on the models. But he’s added to the collection, and last year during Penn’s annual fashion week, he took advantage of an invitation extended from the COO of Barneys

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LISA HELFERT

to meet with her, wearing one of his necklaces and earning yet another internship.

Working with a fashion director at Barneys, he has gone through several iterations of the pieces, even integrating metals and thinner cords of leather and twisted nylon. Because jewelry offers higher profit margins than clothing does, Mohammed is focusing his energy on the former, hoping to sell enough to help pay for



a two-year associate's degree program at Parsons The New School for Design when he's finished at Penn.

With a major in PPE—philosophy, political science and economics—and a minor in business, Mohammed is confident he'll have a leg up on competitors who went straight to design school.

"A liberal arts education is going to be valuable in the future," he says, "just in terms of being a well-rounded person, but also in terms of getting a better understanding of my customer, getting a better understanding of marketing practices and production and things that are essential." Regardless of where he ends up, he will always be "slightly employable," Mohammed says with a laugh.

## INVESTED IN GLOBAL WELL-BEING

Nandini Mullaji talks fast, perhaps because she's got a lot to get done. A native of Bombay who came to Exeter at the beginning of her upper year ("If I could do it again, I'd have gone sooner, but it was two phenomenal years at Exeter," she says), Mullaji is a student in Georgetown's Walsh School of Foreign Service, where she's majoring in regional and comparative studies for emerging economies (India, Russia, China and the Middle East), with a minor in international business diplomacy. After graduation, she's considering pursuing a master's in urban design and planning, to be followed by work in development or social-sector consulting, but not in India, at least initially. Eventually she'll go back to that country to live, she says, and sees herself as a politician there one day.

But even from a distance, Mullaji has India in her sights.

"Giving back to the community has always been something that has guided my decisions," says Mullaji, who returns to India twice a year to visit family and check in on her many non-profit projects. "There's definitely this theme of helping nongovernmental stakeholders benefit public life." Her passion project is working to help nomadic tribes in Gujarat, the westernmost region of India and her father's native territory, through a pilot plan she calls Adopt-a-Tent-School. It's a collaboration with VSSM, an organization dedicated to the rights and lives of nomadic and tribal communities; when VSSM began work with the tribes in 2011, they had a zero percent literacy rate, but that has been on the rise since VSSM began establishing tent

## MAKING THEIR MARKS



**EMMA CLARKSON**  
YALE UNIVERSITY

I was lucky enough to get involved in the Opera Theatre of Yale College and play[ed] in the pit orchestra for a period production of Mozart's *Le Nozze di Figaro*. (We performed with gut strings and baroque bows.) This year I'm on the OTYC board as business manager. I am also involved in the Tiny Baroque Orchestra and am the co-president of another more standard orchestra, which means I help recruit new members, run auditions and select our repertoire.



**BRANDON KAPLOWITZ**  
UNIVERSITY OF CHICAGO

During my freshman year at University of Michigan, I worked with one of the U.S.'s most prominent political science professors, Robert Axelrod—most famous for his game-theoretic work. I [contributed] to his newest paper, "Timing of Cyber Conflicts," and was referenced when it was published by the Proceedings of the National Academy of Sciences. I applied to the Department of Defense [for a summer internship] and continued my research in cyber policy, where I was given free reign to work on projects, both classified and unclassified.



**CHANNING PREND**  
COLUMBIA UNIVERSITY

As the Manhattanville news editor for the *Columbia Spectator*, I was reporting at two nearby [West Harlem] public housing complexes, and I saw a real lack of basic infrastructure (overflowing trash bins, rats etc.). I worked with a friend to organize workshops to educate residents about recycling. This summer, [as an intern] in the NYC Mayor's Office of Long-term Planning and Sustainability, I worked for a program called GreenNYC, which designs public education campaigns on issues related to sustainability. I worked on a campaign to increase recycling in NYC public housing complexes.



**TIFFANY TUEDOR**  
COLUMBIA UNIVERSITY

This summer, I worked as a technology and operations intern at TEDMED, the health and medicine edition of the world-famous TED conference. I managed the content on the website and mobile app and worked on digital marketing and social media. I was also tasked with reaching out to international organizations to invite them to watch the stage program via live stream. We were able to get 147 countries and over 5,000 corporations, academic institutions, teaching hospitals and nonprofits to tune in and participate in the TEDMED conversation.

schools. Through Adopt-a-Tent-School, Mullaji has spent the past three years enticing donors to help the cause. Instead of pledging a specific financial total, though, donors sign on to “a promise for 100 percent literacy,” and commit to funding the schools for however long it takes for a community to attain full literacy.

Next up: Mullaji wants to help create houses for nomadic tribes. In the meantime, her work with VSSM motivated other youth, who asked her for help finding organizations that were looking for volunteers. Through Build-a-Bridge, which she founded in the spring of her upper year at Exeter, she pairs small- and medium-sized organizations across India with people who want to volunteer.

“It’s my way of not just giving back to the Indian community, but also getting to help myself,” says Mullaji, who also runs Engaging India, a lobbying effort to increase awareness of the country’s issues and bring Indian politicians to campus. “And other students and people who work with me benefit.”

This academic year, Mullaji will be undertaking an internship with Ashoka, a worldwide network of social entrepreneurs based in Arlington, Virginia; she’ll focus on Israel and Turkey, where she’ll likely spend part of the summer of 2015. She’s also continuing her work with Hilltop, a student-run consulting firm at Georgetown. It’s a competitive group: As a freshman, Mullaji was one of 250 applicants for 10 analyst openings. This year, she’ll serve as project manager for a team of five students whose real-world client is iKure, an Indian social enterprise that’s focused on low-cost healthcare delivery.

“It’s been one of the formative experiences for me at Georgetown because I’ve gotten to work with a lot of interesting nonprofits and learned a lot of hard skills,” Mullaji says. Equally formative has been her work with the Hilltop Microfinance Initiative, a 501(c)(3) corporation staffed by students, with an external board of directors. Mullaji is the director of strategy at HMFI, which provides small-business loans to people in areas of metropolitan Washington underserved by banks. She cites proudly the story of a client who ran a food truck; HMFI provided him with a loan so he could purchase a second oven, and as a result, his revenues tripled. After two subsequent loans, he was able to open a brick-and-mortar location in the District.

“That’s the impact—we’re actually getting to see results,” Mullaji says. “Now he has something tangible. That’s why I’m so committed to this organization, because it’s really about making an impact.”

## **INSPIRED TO TAKE ACTION**

Alexander Yang, who received the Yale Cup and a Cox Medal at graduation, gave an Exeter Talk on stem cells, but his interest in science began much earlier—as far back

as seventh grade, when his science fair project involved the construction of a prosthetic limb using sensors that wrapped around the body (“It was a really stupid project,” he says with a laugh). A four-year Exonian and a native of Vancouver, Yang was involved with MECExeter, an engineering-focused club. The most memorable project he participated in was the construction of a 20-foot concrete canoe that actually floated—with passengers including Yang—in the Squamscott River.

“Things like that sparked my interest in thinking outside the classroom,” Yang says. “If there’s one thing I learned at Exeter, it’s that you have to appreciate what you learn in the classroom, but you realize that it’s so much more fulfilling when you pursue things on your own track, and take big risks like that.”

Yang has been working at the Wyss Institute since the beginning of his freshman year at Harvard. There, he’s a member of the team headed by Jennifer Lewis, Sc.D., which is trying to improve bioprinting, using 3-D printers to create human organs. Their approach has been to use cells to print a mesh of blood vessels into which they place a stem cell; an organ will then begin to develop. But what’s perhaps most noteworthy to Yang is the disparity between the products 3-D printers can create, with plastic cups on the one hand and human organs on the other.

“That’s the gap that I’ve been trying to address,” says Yang. “I’m familiar enough with the 3-D printing industry that I know there’s a huge gap in the middle where you don’t really have anything that’s cost effective but also high impact, and I’ve been trying to find a niche there.” And that’s what led him to South Africa and van As and his prosthetics.

“That was the first time I’d seen 3-D printing technology have such a high impact at such a low cost,” says Yang, who is eager to determine how such technology might be rendered practical in the United States. The Robohand design is open source, meaning anyone can download the plans off the Internet. That has led some to attempt to establish a U.S. presence for it, but they’ve failed when faced with the country’s stringent testing and regulatory requirements. So Yang is planning to visit medical centers and regulators to determine what needs to be done to make the prostheses more widely accessible to U.S. citizens. The eventual goal worldwide is to set up local hospitals with printers and teach officials there not only how to print—which Yang says is only 20 percent of the work—but also how to assemble the prostheses.

“The idea is that this thing is going to be sustainable even without our work,” Yang says. “In order for this to scale, you want to encourage people to step up and help themselves. That’s the big idea with this project.”

Yang, who is majoring in biomedical engineering



and minoring in history, has no shortage of big ideas. One that has spun out of the 3-D technology work is the establishment of a program that would involve the long-term lending of lathes, injection molds and other manufacturing equipment to villages in developing nations. One member of a village would be in charge of the equipment, paying rent and making money by selling the products, which would include such household items as pots and chairs.

“I really like the idea of empowering more individuals to develop their own products,” Yang says. He is also working with Evan Gastman '12 on a book for high school students that discusses how to be a “high-impact” individual (hint: find problems around you and work toward solutions), as well as a “connectome” that would allow students to use the Internet more efficiently when

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—Alex Yang is hoping to introduce affordable, 3-D-printed prostheses to the United States.

doing research projects or digging into personal interests. His long-term goal is to stay involved in the entrepreneurial side of biomedical engineering, building products and making them accessible to people in affordable and practical ways. ■

DAMIAN STROMMEYER

