

AT COOPER

SUMMER 2018

THE COOPER UNION FOR THE ADVANCEMENT OF SCIENCE AND ART

truth



WE CELEBRATED TRUTH
WE INAUGURATED A
PRESIDENT
WE RE-ENERGIZED
THE GREAT HALL



WE SHOWCASED
STUDENT WORK
WE GRADUATED
A NEW CLASS
WE HONORED
ALUMNI



WE ARE
MOVING FORWARD TO FREE





The Cooper Union is on the move! In this issue of *At Cooper*, you will see evidence of our progress and the growing momentum across the institution that is affirming our aspirations for the future.

A highlight came this summer with our statement of reaccreditation from the Middle States Commission on Higher Education. Achieving the commission's seal of approval happened through a highly collaborative process here and signals the commission's recognition of a new, productive path for Cooper.

Of course, contributing to that new path was the Board of Trustees' landmark vote in the spring to return The Cooper Union to full-tuition scholarships for all students. As we said at that time, the plan, which unfolds across a 10-year timeframe and can be accelerated if new monies are raised more quickly, is ambitious but achievable. We are seeing early, exciting signs of success. By the close of our fiscal year on June 30, 2018, we had exceeded our financial goals for year 1 of the plan through a lot of hard work, fiscal discipline, and a high level of donor commitment. Alumni rallied, surpassing recent alumni participation rates for our Annual Appeal. Our board stepped up with increased personal giving and fundraising levels in FY18 over FY17. Additionally, among our growing list of institutional donors, the IDC Foundation awarded a \$2 million grant to Cooper for the expansion of multidisciplinary fabrication space. (See story on page 7.) For all of this and more, we are grateful.

Our academic leadership team continues to take shape, as well. This spring, we appointed Barry Shoop as dean of the Albert Nerken School of Engineering. (See story on back cover.) At West Point, Shoop stewards the #4 program nationally in electrical engineering and computer science. He is well respected and well connected nationally, and I expect he will build on the legacy of successes in the school of engineering while leading important transformative efforts, including critical, cross-disciplinary initiatives with our other deans. We look forward to welcoming him to The Cooper Union in January.

We are seeing that positive change is possible here. And yet as we continue to manage our change for the future, we see so many national and international issues that command our attention. This past year, an Irwin S. Chanin School of Architecture studio tackled housing design amidst the social issues of storm-ravaged Puerto Rico. The students' solutions went well beyond the concept of shelter, with designs focused on flexible, sustainable community-building. (See story on page 20.) This summer, when news broke of families being separated at our southern borders, Cooper Union became the venue for the benefit *Concert for America* in support of organizations assisting impacted families. On our Great Hall stage were Chita Rivera, Idina Menzel, Audra McDonald, and Tina Fey, along with many other Broadway stars, to raise funds for this important cause.

The spirit of our incredible community is what makes all of this possible, whether charting our own path forward or impacting the world around us. I look forward to our continued work together and to discovering all that we can accomplish.

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Andrew Arnold | Managing Editor | aarnold@cooper.edu
 Mindy Lang | Creative Director | lang@cooper.edu
 Angela Starita | Senior Writer | astarita@cooper.edu
 Charlotte Egerton | Communications Specialist | cegerton@cooper.edu
 Kim Newman | Media Relations Manager | kneuman@cooper.edu

COLLABORATING IN NEW SPACES

BY CHARLOTTE EGERTON

Though a word suggesting unity is in the school's name, The Cooper Union is historically discipline-centric, with each of the three distinct schools developing pedagogy independently. Students take humanities and social science courses together, but that is the extent of their formal crossover. Art, architecture, and engineering share principles—design, making, critical thinking—and practitioners of the three subjects often collaborate in industry, so why not in this setting? One faculty member has taken steps to change that. Sam Keene, associate professor of electrical engineering, conceptualized and taught two cross-disciplinary courses in the spring 2018 semester, bringing architects, artists, and engineers into the same classroom with shared learning goals.

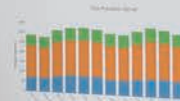


FeedNYC.org

Feed NYC is a database of government and not-for-profit organizations that focus on tackling the issue of food insecurity in New York City. Contained within Feed NYC are organizations like City Harvest, which rescues and redistributes excess food from around the city, and The Food Bank for New York.



Our data set includes data from food pantries, shelters, and soup kitchens around the city. Included are the addresses of each facility as well as the Health Code Violations that each one has received. Monthly numbers of meals served are sorted by the general age of the person receiving the meal.



Number of Facilities: 3401
Years of Servicing: 17
Types of Facilities: 17
Meals Served: 337 Million

Proposed Final Visualizations:

- Interactive map of the city that shows how facilities have changed from 2001 to the present.
- Topographical model of the city that relates elevation to the food being served in an area.
- Prototype of a meal in progress that connects to not only the data but to the experience of eating a proposed meal.



Sam Keene, associate professor of electrical engineering, Albert Nerken School of Engineering

Margaret Long

Keene has been a member of the Albert Nerken School of Engineering faculty since 2009. He has had a wide range of research interests, including wireless communication and networks, signal processing, machine learning, and data science. While pursuing his doctorate in electrical engineering at Boston University, he tacked on an interdisciplinary certificate in computational science. You could liken his inquisitive mind to that of Peter Cooper, who balanced multiple curiosities and turned them into inventions and innovations. In fact, one of Keene's first forays into multidisciplinary teaching was in a subject related to Peter Cooper's past: beer brewing. Peter Cooper's father built two breweries up the Hudson River in the early 19th century and the young Cooper learned the trade from him.

In the fall of 2016, Keene pitched the idea of a class in fermentation science to Richard Stock, dean of the school of engineering. The idea in itself was interdisciplinary, as Keene would be exploring processes of chemical engineering, from fundamentals of water chemistry to microbiology and yeast health. But Keene was also interested in covering the history of brewing alongside recent brewing innovations and entrepreneurship. The course was classified as an independent study open to students of all three schools. Four students enrolled from the mix of backgrounds Keene was hoping for—art, architecture, and chemical and electrical engineering.

The success of this experiment prompted Keene to develop courses that were formally cross-listed in different schools. Like his brewing course, the new classes would be project-based rather than discussion-and-task centered. "This ensures students are not just learning alongside each other, but learning from each other," he says. "They bring different skills to this experience and make for a more stimulating environment."

Keene took another element of Peter Cooper's life for a course concept—social justice. The course would educate Cooper students to solve real-world, data-oriented problems in education, equality, justice, health, public safety, economic development, and other areas. By partnering with nonprofits, social enterprises, and government agencies, students would learn to apply data-science, machine-learning, and software-engineering principles to problems that have significant social impact.

This time, Keene brought his idea straight to President Laura Sparks. Through a contact of Sparks, Keene was connected with Will Shapiro, the founder and chief data scientist of Topos Inc., a company using artificial intelligence to understand





Dot density map showing the food insecure population within each defined neighborhood. Every dot represents 100 people missing food. Each team displayed its findings at the End of Year Show (below).



João Enxuto

cities, as a potential co-instructor for the course. It turned out that Shapiro was himself a 2013 graduate of The Irwin S. Chanin School of Architecture. Shapiro’s unique background in architecture and data science—he also studied mathematics at Brown University and Cambridge University—was a serendipitous match. Additionally, Shapiro was already on the architecture adjunct faculty. “Will was crucial to recruiting architects for the course and brought a perspective of thinking about space in a certain way that I do not have,” Keene says. They received support from Dean Nader Tehrani and Associate Dean Elizabeth O’Donnell to cross-list the course in the school of architecture as Data Science for Social Good.

Keene, with the help of the Robin Hood Foundation, recruited six nonprofits as clients for the class. In intentionally formed multidisciplinary groups, students used data from the clients combined with open data sets to provide a fresh look and make comparisons. “It ended up as more of an exploration of their data than solving a problem,” Keene admits. “It was hard to dive in deeply with only one semester. But each group ended up providing a helpful observation from the data that we hope the client will utilize.”

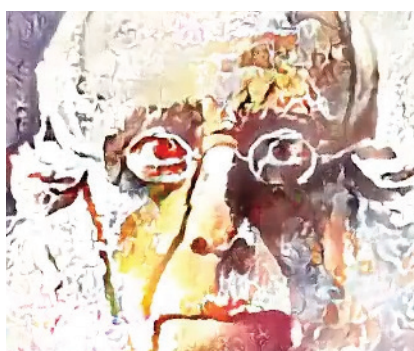
Two groups worked with data sets provided by clients City Harvest and FeedNYC, organizations dedicated to eliminating food insecurity in New York City. Their data sets included historical and geographical information on food facilities and details on the people served. To help City Harvest plan for new facilities, students developed a machine-learning model that predicted the turnout at a new location prior to the facility being built. A group also studied the data to find “food islands,”

or networks of different facilities close enough to each other that, when combined, can provide food to nearby populations seven days a week. Finally, students mapped areas of food insecurity using Geographic Information Software. They compared information on food need versus existing food availability to visualize food deserts. Using a CNC milling machine, an architecture student also built a physical model of this representation.

Keene hopes to continue some of the partnerships and expand research. He is considering pursuing a National Science Foundation grant to keep the class going. “It was a win-win-win situation,” he says. “Students gained experience in this type

of work, expanding job pursuits for some; it raised the profile of The Cooper Union as an institution, and it helped a nonprofit organization.”

Meanwhile, Keene was cooking up his other idea. (Yes, he created two new cross-disciplinary courses in vastly different subjects over the course of six months.) He worked with electrical engineering students on a potential machine-learning art exhibition last year, but the idea fizzled. Keene wanted to resurrect the concept but as a class that would provide structure and a much-needed artistic collaborator. Through another Cooper connection, Trustee Kevin Slavin A'95, Keene met Ingrid Burrington, an artist and writer interested in co-teaching the course. “I realized I had no idea how to grade art!” Keene says. “Ingrid was essential for her knowledge and teaching experience.”



The class, named Machine Learning and Art, was a free exploration of the intersections between those disciplines. Students explored and translated complex concepts into creative projects. One assignment involved using machine-learning methods to transform a piece of media from one form to another. George Ho, an engineering student who took both courses as a junior, altered a photo of Peter Cooper in multiple ways. Using different algorithms, he transformed the static Peter Cooper into a moving image who crosses and rolls his eyes.

Keene and Burrington required that many projects be presented in analog form, challenging students to think beyond creating something digitally. An open-ended final project was completed in larger groups. From the start, he planned to have students present their final projects in Cooper's annual student exhibition. “Engineering classes aren't conceived with the idea of presenting in the show; we made sure this one was,” Keene says.

Final project examples included a *Jeopardy!* game where the machine estimated the value of each trivia question and an edition of the *Cooper Pioneer* student newspaper in the year 2040 where each article was seeded with a few words and then machine-generated. One group created an A-Z letter book, akin to a children's book. For each letter, the students chose a popular word and an image that represented that word. They ran each image through a machine-learning algorithm to provide captions. The resulting captions show the difference between the word the students associated with the photo, and what the computer saw.

To make the class happen, Keene met with Mike Essl, dean of the School of Art, who shepherded the course through the curriculum committee. It was classified as an elective course, which Keene learned was problematic for recruiting students. Of the 130 credits art students need to graduate, 54 are studio credits. “I had a lot of students drop the course when they realized it wouldn’t count toward their studio credits. In fact, the art students who remained in the course had all their elective credits already, so taking the class didn’t meet any graduation requirements.”

Keene also learned about the different, but just as important, meaning of “studio” for architecture students and how it affected enrollment in his Data Science for Social Good course. He watched architecture students drop the course when they realized they couldn’t balance the workload with their studio-time commitments.



George Ho

These weren’t the only road-blocks he encountered. Both of his classes had to be scheduled in the evening to accommodate the adjunct instructors’ work schedules. Team teaching was also time-consuming, especially for a brand-new course. “It involved coordination with your partner on every detail,” Keene says.

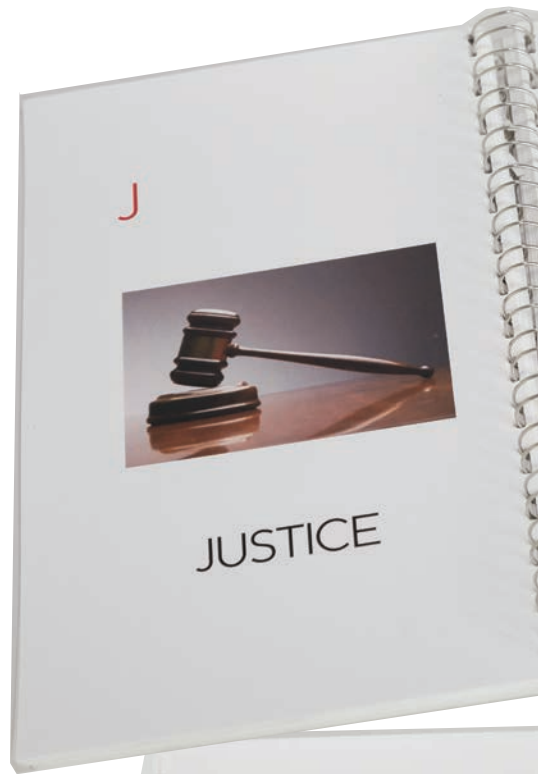
Yet the feedback he received from students in the courses has encouraged him to continue offering courses of this nature. “I think the biggest takeaways were how to coordinate with and manage team members who had vastly different skill sets than my own,” George says. “The artist and architect on my team added value to the projects in a way that I couldn’t, simply because I can’t do what they do: I haven’t been trained to think like a designer, I’ve never put up an exhibit before, I’ve never used Photoshop or InDesign in my life. By the same token, the artist and architect can’t do what I do: they have no idea what NMF is, they’ve never run an SQL query, they couldn’t use UNIX command line utilities to format a 2GB csv file. I think that this is the point of the interdisciplinary work: people from different backgrounds, trained in completely different fields, should be brought together to attack one problem.”

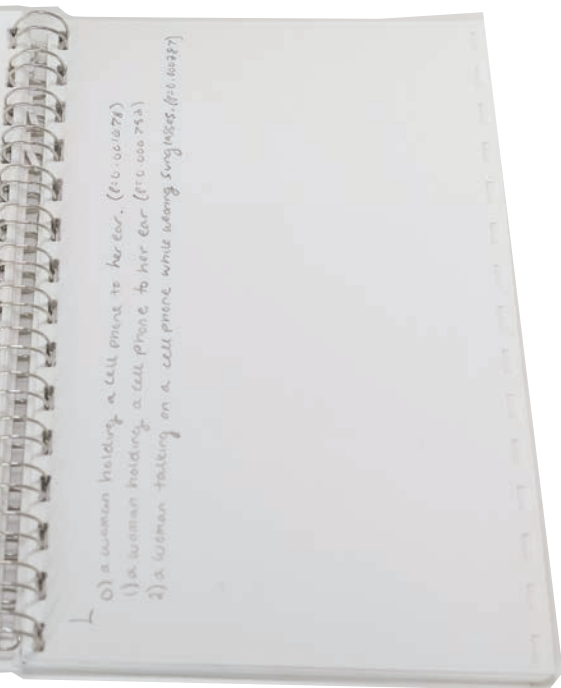
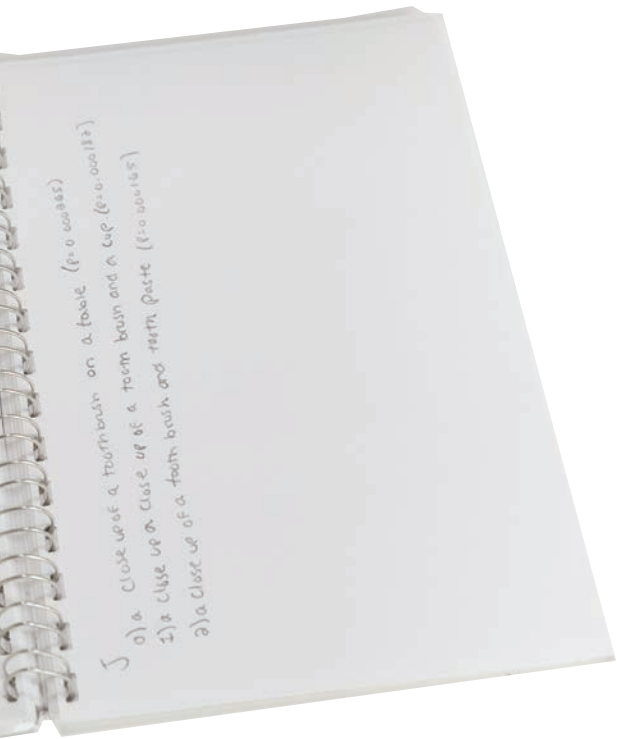
While Keene’s courses are prime examples of intentionally and formally mixing students, inter- or cross-disciplinary work does occur organically at The Cooper Union. Each school has a list of classes open to students from other schools; civil engineers frequently take architecture courses and you can find architects in hand-drawing classes for artists. Collaboration has also happened in surprising

ways. This spring, Lucy Raven, an assistant professor, found her Audiovisual I class, a prerequisite for moving-image studio classes in the School of Art, to have predominantly fourth- and fifth-year school of architecture students. “They were older students with a sophisticated vocabulary and were well into their coursework, but, like the younger art students, they were more or less new to making moving-image work, as well as to cinema analysis and artists’ moving-image theory and history,” Raven tells us. “Here, the prevalence of architects led me to consider the structure of teaching the moving image in relation to more-literal ‘structures’—buildings and infrastructure, both physical and virtual.” She witnessed the artists and architects learning and growing from each other, both in presentation techniques and critique styles.

Sparks has shown her support for creating more cross-disciplinary opportunities at the institution. As is evident from some of the challenges Keene faced, there is still a great amount of work to do to change the learning landscape, but shifts are happening. In early 2018, The Cooper Union received a \$2 million grant from the IDC Foundation to create a multidisciplinary laboratory for all three schools [see sidebar]. Through the Community Planning Collaborative, a volunteer group of faculty, staff, alumni, and students providing feedback on strategic-planning efforts, a working group was created to examine the structural and logistical barriers to interdisciplinary education. Unsurprisingly, Keene is at the helm of this group. The group will propose solutions that respect the distinct characteristics of each school, but work toward providing additional opportunities for cross-disciplinary work.

This fall, Keene is offering his fermentation-science course again, but this time it is not listed as an independent study. Students can enroll in EID334: The Science and Art of Brewing. Keene says having a course number “makes it more official” and affirms his hope that the lines between the schools will continue to blend. ■





Pages from the A-Z letter book, a final project in the Machine Learning and Art course. For "Justice," the computer created a caption for a photo of a gavel: "A close up of a toothbrush on a table." For "Love," the computer captioned the iconic V-J Day photo: "A woman talking on a cell phone, wearing sunglasses."

Margaret Long



Lea Bertucci

Members of the proposal team discussing next steps for the lab.

COMING SOON: AACE LAB

In early 2018, The Cooper Union was awarded a \$2 million grant from the IDC Foundation to create a new multidisciplinary lab space. This foundation was born from the Institute of Design and Construction, a former Brooklyn-based nonprofit that trained more than 30,000 New Yorkers before closing in 2015. The IDC Foundation is a charitable institution providing funding for scholarships, fellowships, and grants to educational institutions for students in the design, engineering, and construction fields. IDC released a request for proposals for its first round of grants in the summer of 2017. In addition to Cooper, Columbia, NYIT, NYU, and Pratt also received various amounts of funding.

Cooper's proposal was a collaborative exercise, involving members of the development staff, deans, and associate deans of the different schools. Each school identified three to five high-level concepts which were then narrowed down to two main themes. Leaders solicited ideas and feedback for each theme from the faculty. The idea of an interdisciplinary fabrication lab became the clear front-runner. "The discussions about the ideas and possibilities for collaboration between the schools were enjoyable and eye-opening," says Anita Raja, associate dean of the Albert Nerken School of Engineering and a member of the proposal team. "The grant-writing process proceeded very smoothly despite it being our first foray into such a large-scale interdisciplinary effort."

The resulting Art, Architecture, Construction, and Engineering (AACE) Lab will serve as a catalyst for integration across the institution, with equipment allowing projects that involve "making," from 3-D printers to robotic arms to virtual-reality technologies. The space will take advantage of one of Cooper's longstanding salient qualities—translating intellectual activities into practical applications.

Raymond R. Savino, president of the IDC Foundation, was excited about the opportunity to support interdisciplinary collaboration at The Cooper Union. "President Sparks and her team are impressive in their commitment, creativity, and vision in educating the next generation of industry leaders," he says. "Their aims and aspirations match up nicely with the mission of the IDC Foundation and the legacy of the Institute of Design and Construction."

Students will be introduced to the lab in their first year through a shared workshop in the space. The committee expects other cross-disciplinary courses as well as Cooper's outreach programs to use the lab. Opportunities to engage the public through workshops will also exist. "We anticipate that the AACE lab and the associated projects and courses included in the proposal will provide strong stimulation for more interdisciplinary opportunities that will be exciting prospects for students and faculty alike," says Raja.

COOPER ON THE MOVE!

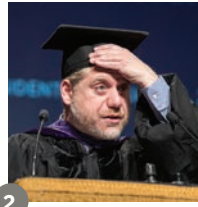
WE CELEBRATED TRUTH

“My design is to establish this institution, in the hope that unnumbered youth will here receive the inspiration of truth in all of its native power and beauty, and find in it a source of perpetual pleasure to spread its transforming influence throughout the world.” —PETER COOPER, letter to the Board of Trustees, 1859

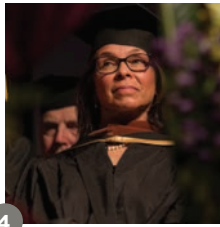
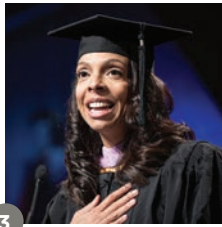
In early February a weeklong schedule of public programming and community events took place at The Cooper Union. Its theme of “Truth” sprang from a passage written by our founder. The series started with “Who Needs Truth: An Evening of Politics and Performance.” Damian Woetzel (1) formerly of the Aspen Institute and new president of the Juilliard School, a co-presenter, in association with the Public Theater, introduced the proceedings; Harvard political philosopher Michael Sandel (3) led a public debate on the fate of truth in our society. The program also included readings and performances by John Lithgow (front cover), Jose Antonio Vargas (2), Bill Irwin (4), and Elizabeth Alexander accompanied by Michelle Dorrance (5). Later that week, Erica Armstrong Dunbar (6, on left, with Nancy Giles), author of *Never Caught: The Washingtons’ Relentless Pursuit of Their Runaway Slave, Ona Judge*, delivered the John Jay Iselein Memorial Lecture. Other events included a panel on a Cooper education in 2040 (7).



WE INAUGURATED A NEW PRESIDENT



The Cooper Square Singers closed out the program with a rousing rendition of "Truth to Power"



A little over a year since she became The Cooper Union's 13th president, Laura Sparks' official inauguration took place as part of the larger Truth event. Guests traveled from schools across the country to offer their institutions' greetings. Planned as an opportunity to foster greater unity within the Cooper community, Mike Essl A'96 (1, left), a plaintiff in the lawsuit against the Board of Trustees appeared on stage with Kevin Slavin A'95 (1, right), a member of the Board. Also appearing: John Oleske (2), assistant attorney general of New York State, who helped broker the settlement of the lawsuit. Other alumni speakers included Jean Brownhill AR'00 (3), the founder of Sweeten, photographer Jeanne Moutoussamy-Ashe A'75 (4), and Stephen Welby ChE'87 (5), executive director of the Institute of Electrical and Electronics Engineers.

Education | Excellence | Vision | Social Justice
Citizenship | Equity | Leadership | Progress
Humanity | Advocacy | Legacy | Engagement
Integrity | Diversity | Generosity | Discourse
Responsibility | Truth

THE INAUGURATION OF LAURA SPARKS | 13TH PRESIDENT | FEBRUARY 6, 2018



COOPER ON THE MOVE!

WE RE-ENERGIZED THE GREAT HALL

One of President Sparks' primary goals has been re-energizing the Great Hall to make it closer to what Peter Cooper intended when it opened in 1858: a destination for people to gather, to organize, and to push our country's thinking forward to create a more inclusive society. We ran many at-capacity events; the academic year kicked off with contemporary artist and activist Ai Weiwei (front cover) as he connected art with social commentary on the global immigration crisis. Likewise it was standing room only for Dr. Atul Gawande (4), who spoke of the thorny intersection of science and humanity, and legendary jazz musician Wynton Marsalis (5), who recounted his personal struggle growing up in Jim Crow-era Louisiana and how music brought him through it. We welcomed back trailblazing alumni, including painters Lois Dodd A'48, Thomas Nozkowski A'67, and Philip Taaffe A'77 for a conversation on painting (1). Other guests included Sheldon Rubenfeld ChE'66 (6), executive director, Center for Medicine after the Holocaust, and Daniel Arsham A'03 (3), who straddles the lines between art, architecture, and performance. Panels addressed issues of the day, including fake news, Black Lives Matter, #MeToo, and the phenomenon of "mansplaining." Mike Essl A'96, Alexander Tochilovsky A'00, Barbara Glauber, and Ellen Lupton A'85 took the stage as part of our annual Typographics festival (7). We also partnered with the Public Theater, the Strand Bookstore, and PEN America, which brought Hillary Rodham Clinton (8). As the academic year wrapped up, the Great Hall showcased the Concert for America, featuring entertainers such as Tina Fey (2)—a benefit in support of immigrant families separated at the border.



1



Sophia Bennett-Holmes

2



3



Sophia Bennett-Holmes

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7



6



8

Julian Horn/Courtesy of PEN America

WE HONORED ALUMNI



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2

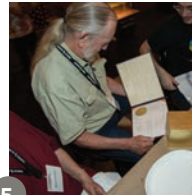


3

The 50th anniversary reunion of the Class of 1968 capped a yearlong celebration of alumni. Irma Giustino Weiss A'45 was remembered for her ceaseless support of The Cooper Union when a plaque in her honor was unveiled in the Foundation Building colonnade (1, 2). Not long thereafter, Eva Hesse A'57 (3) was remembered through a free screening of the 2016 documentary about her. As in years past, at commencement a number of alumni were bestowed with the Presidential Citation for their contributions to their fields: This year Marisa Lago PHY'77 (6), Patty Jenkins A'93 (8), and the founders of Situ Studio, Brad Samuels, Wes Rozen, Basar Girit, and Aleksey Lukyanov-Cherny, all AR'05 (front cover), received the honor. As part of the 2018 annual reunion, guests toured campus (4, 5) and cruised up the Hudson on the Spirit of New Jersey (7).



4



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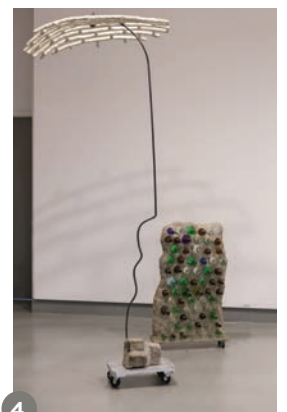
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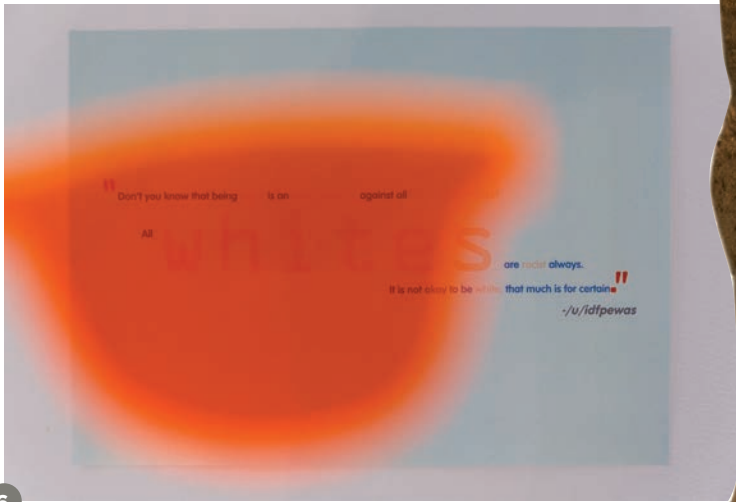
COOPER ON THE MOVE!

WE SHOWCASED STUDENT WORK

Our annual year-end showcase gives students from all three schools an opportunity to display one or more of their projects. Here is a small sampling of student work from this year's show followed by excerpts from our annual website feature, "Senior Snapshots," in which several graduating seniors reflect on their time at Cooper and the work they produced. See cooper.edu/at-cooper for more images and graduate profiles.

- (1) *Eli Kim AR'21, Design II*
- (2) *Din Din AR'18, Thesis: "The Impossible Playground"*
- (3) *"Assistive VR Telepresence Robot"*
- (4) *Louis Chan A'18*
- (5) *Tereza Mundiłova (exchange student) with Rio Sofia A'18 behind*
- (6) *Data Science for Social Good: "Hate Speech on Reddit"*
- (7) *Juan Alvear A'18*
- (8) *Anita Maksimuk A'20*





WE SHOWCASED STUDENT WORK



9



10



11



13

- (9) Maayan Perez AR'18
Thesis: Domestic Futures
- (10) Alfred Dudley III A'18
- (11) Lea Simonello A'19
- (12) Johnathan Wilborn A'21
- (13) Jacob Jackmauh A'18
- (14) "SPLAT: Superior Precision
Landing for Autonomous
Touchdowns"



12



14

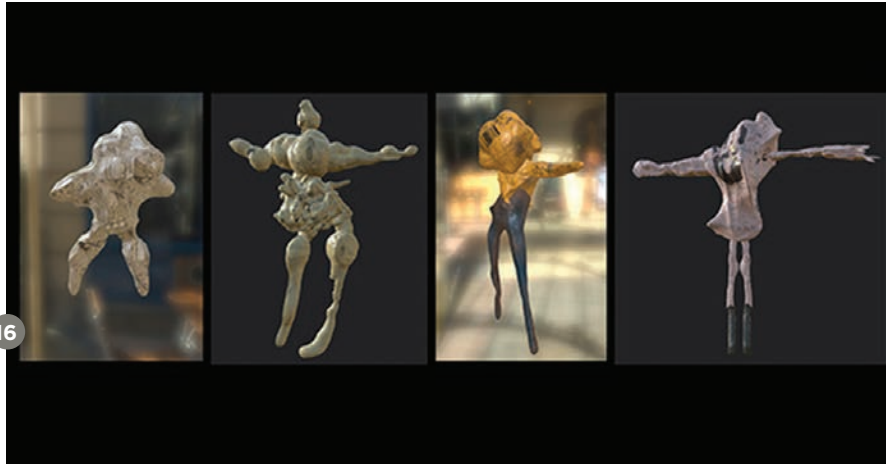


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When she was 13, **Naomi Lisiki** AR'18 moved to Ridgewood, Brooklyn, from a beach community in the French West Indies. She started making art when she arrived in the U.S. "It was such a different environment and I didn't speak English. So it was a way to have conversations. I am interested in finding in the work things I cannot find in language. I think art refers to the senses the same way poetry does. So I am always looking for that in making things.

"I love painting. I have to do it. It brings joy to my life," Naomi says. Using oil paint on canvas, she applies small, densely packed marks in vaguely symmetrical patterns. Though still abstract, the stippling may remind viewers of rubbed fur, or blades of grass blown in the breeze. Each painting can take many months to complete. "I like being patient with my work. It becomes my passion and nothing matters anymore. It's meditative but also has moments like, What's going on here? How am I going to do this? These moments are important, as they make the painting an evolving journey."

Bashfully, she says she applied to the Yale MFA program...and has been accepted. "I think The Cooper Union is very special," she says. "It's a community of artists, architects, and engineers. Even if I didn't take those classes, architecture or engineering, I saw them working in the shop and around school. I learned a lot here. It was a very constructive experience. Material-wise I am evolving but my relationship to my work has become deeper."



16

(15) Painting by Naomi Lisiki AR'18
 (16) Figures from video by Rick Farin AR'18
 (17) ChE 2018 capstone project:
 a production plant for making
 nylon 6,6

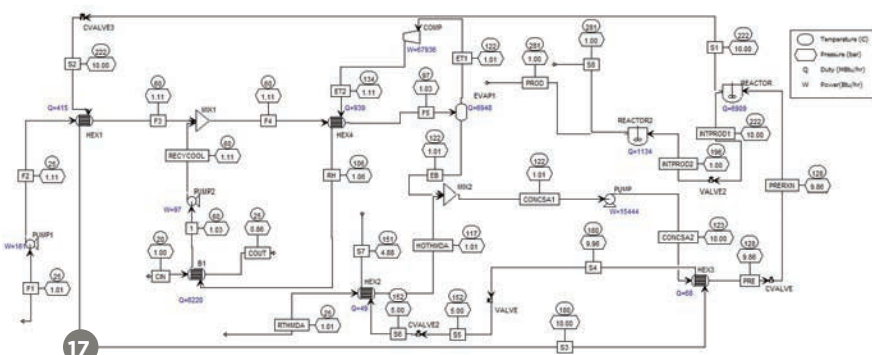
Trying new things has been the credo for **Daniel Galperin** ChE'18 and **Anushree Sreedhar** ChE'18 during their time at school. Active members of multiple performing and professional clubs as well as working on the school paper, they found themselves on the same team, with two others, as part of the group-based senior "capstone" project. Assigned to design a production plant that would make a polymer called nylon 6,6. Daniel focused on the process design while Anushree examined the business factors.

This division followed their personal interests in the field. Anushree has turned her attentions to the data end of the chemical engineering field, while Dan specializes in the nitty-gritty details of process. After graduating she will begin working for Accenture, a management consulting firm. Daniel will be doing pretty much the opposite when he starts work at Watts Water Technologies, creators of plumbing, heating, and water-quality solutions. "I know it doesn't sound interesting, but to me it is fascinating," Daniel says.

Addressing the relationship between architecture and video games, **Rick Farin's** AR'18 thesis project asks an essential 21st-century question about digital spaces: "Where are we?" It would be fair to say that for Rick, this is a question whose answers have ramifications both in design and in architecture education. At the school of architecture, where drawing has particular importance in the school's pedagogy, he has often developed methods to navigate the digital arena in relationship to hand-drafting. He believes digital space-making is as valid a venue for thinking about space as a physical site. "It's not that I think one is more valid than the other, but I do think that understanding and working with both simultaneously is worth serious consideration. The materials and means by which digital space is constructed are not so different from what is normally considered traditional architectural elements." He points out that most children play video games daily and are at home with what he calls a "new spatial paradigm."

For his thesis project, Rick created a video game that takes players on a journey through their own technology, allowing them to travel along all the sites where the very material of their computers has been mined, refined, manufactured, and recycled, too. Part of his thesis asks players to realize their own culpability in the polluting and harmful acts that this production line inflicts, with a deeper objective of trying to provoke what he calls "digital empathy."

The soundtrack acts as a narrative for the game, constructing an emotional affect as the players progress. Sound is the central medium for these narrative explorations. (Rick has traveled around the world as a performer under the name Eaves and has written and produced multiple albums.) As he puts it, "I'm using audio as a spatial tool."

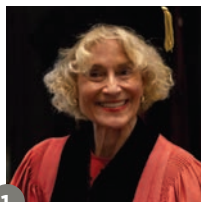


17

COOPER ON THE MOVE!

WE GRADUATED A NEW CLASS

The commencement for the 159th graduating class of The Cooper Union for the Advancement of Science and Art took place on May 23, 2018. Dr. Martha Nussbaum (1), a professor of philosophy at the University of Chicago, delivered the commencement address. Members of the student council presented the senior class gift earmarked for the Center for Career Development. Tobias Stein CE'18 (3), delivered the student address that ended: "We came here wide eyed, brilliant, and curious. But we leave far better than before—knowing what questions we can now answer, but far more importantly, what questions we need now ask... Thank you Peter Cooper."



1



2

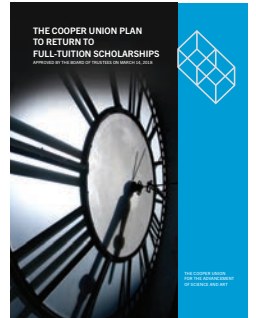


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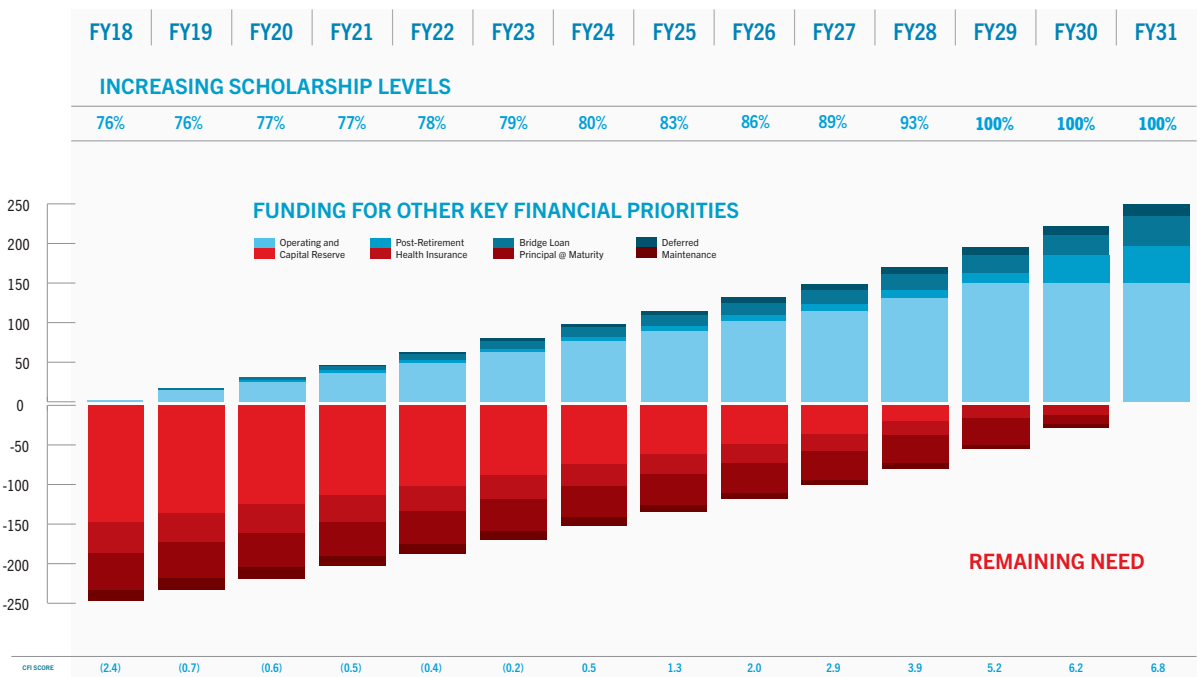


WE ARE MOVING FORWARD TO FULL-TUITION SCHOLARSHIPS

On March 14, 2018 the Board of Trustees voted to adopt a plan that returns our historically free, highly competitive private college to a model of full-tuition scholarships for all undergraduate students. Under the plan, scholarship levels will begin increasing in just two years, ultimately restoring the full-tuition tradition in 10 years time. Investment in academic programs and the physical plant will continue in an effort to build long-term financial health. All of this will require sustained expense management alongside significant new fundraising. Those initiatives have begun. In the last fiscal year, the number of Cooper Union’s institutional funders increased from 17 to 24, and we received a \$2M grant from the IDC Foundation to kickstart a new multidisciplinary lab (see page 7). Alumni participation for all giving was the highest in four years. Giving to the Annual Fund also increased by 16 percent.



ALLOCATION OF RESOURCES TO KEY FINANCIAL PRIORITIES



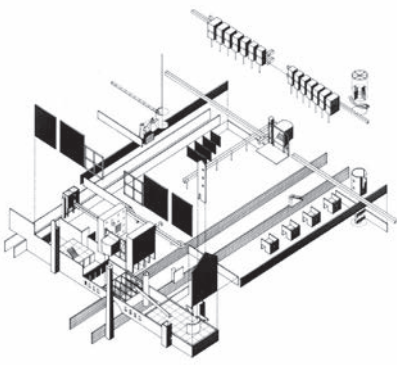
“The Cooper Union’s Board of Trustees and Office of the President are pleased and proud to announce the Board’s approval of a comprehensive plan to return to full-tuition scholarships for all undergraduate students. This marks a historic turning point. With the adoption of this plan, the Board has declared its unequivocal commitment to returning to free.”

—Statement to The Cooper Union community, March 15, 2018
 Rachel Warren, chair of the Board of Trustees and Laura Sparks, president

“I’ve been quietly sobbing to myself all day,” Mr. Essl said. “Cooper Union isn’t Cooper Union unless it’s free. I wouldn’t be this optimistic if I didn’t see progress.”

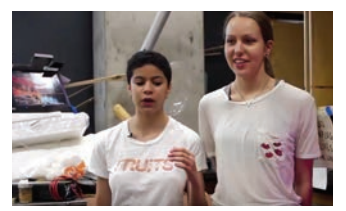
—The New York Times, March 15, 2018
 Mike Essl A’96, dean of the School of Art and member of the Committee to Save Cooper Union which sued the institution over its change in tuition

ON COOPER



CLASS NOTES

SCULPTOR MEREDITH BERGMAN A'77 WILL DESIGN THE FIRST STATUES OF REAL WOMEN IN CENTRAL PARK



30 SECONDS...

A VIDEO SERIES OF SHORT CLIPS WHERE WE VISIT STUDENTS IN THEIR STUDIOS AND LABS

ARCHIVE AND ARTIFACT: THE VIRTUAL AND THE PHYSICAL

THE SCHOOL OF ARCHITECTURE BRINGS TOGETHER 50 YEARS OF THESIS WORK IN THE ARTHUR A. HOUGHTON JR. GALLERY, OPENING ON OCTOBER 23, 2018. ABOVE, L TO R: STANLEY ALLEN AR'81, "THE THEATER OF PRODUCTION," THESIS, 1980-81; DANIEL WILLS AR'12, "INSTRUMENTAL LANDSCAPES," THESIS, 2011-12. GENEROUS SUPPORT FOR THIS EXHIBITION WAS PROVIDED BY THE GRAHAM FOUNDATION FOR ADVANCED STUDIES IN THE FINE ARTS AND THE LEON LEVY FOUNDATION.

HSS POSTDOCS AROUND THE WORLD

HOW THREE PROFESSORS' WORK HELPS SUPPORT A MORE GLOBALIZED CURRICULUM



WHAT IS FEMINISM? COME AND FIND OUT

FIRST FEMINIST MASS MEETING
at the PEOPLES' INSTITUTE, Cooper Union
Tuesday Evening, February 17th, 1914, at 8 o'clock, P. M.
Subject: "WHAT FEMINISM MEANS TO ME."
Ten-Minute Speeches by
ROSE YOUNG GEORGE CREEL
JESSE LYNCH WILLIAMS MRS. FRANK COTHREN
HENRIETTA ROOMAN FLOYD DELL
GEORGE MIDDLETON CRYSTAL EASTMAN BENEDICT
FRANCES PERKINS EDWIN BURROUGHS
WILL IRWIN MAX EASTMAN
Chairman, MARIE JENNEY HOWE.

SECOND FEMINIST MASS MEETING
at the PEOPLES' INSTITUTE, Cooper Union
Friday, February 20th, 1914, at 8 o'clock, P. M.
Subject: "BREAKING INTO THE HUMAN RACE."
The Right to Work—RHETA CHILDE DORR
The Right of the Mother to Her Profession—BEATRICE FORBES-ROBERTSON-HALE.
The Right to Her Conditions—MARY SHAW.
The Right to Her Name—POLA LA FOLLETTE.
The Right to Organize—ROSE SCHNEIDERMAN.
The Right to Ignorance—NINA WILCOX PUTNAM.
The Right to Specialize in Her Industry—CHARLOTTE PERKINS GILMAN.
Chairman, MARIE JENNEY HOWE.

ADMISSION FREE. NO COLLECTION.



WE DISSENT

AN EXHIBITION ON THE DESIGN OF THE WOMEN'S MOVEMENT RUNS OCTOBER 2-DECEMBER 2. ORGANIZED WITH THE SUPPORT OF THE ANDY WARHOL FOUNDATION FOR THE VISUAL ARTS AND THE GEORGE CAMPBELL EXHIBITION FUND

100 DAYS OF LUBALIN

A WEBSITE LAUNCHED BY THE HERB LUBALIN STUDY CENTER OF DESIGN AND TYPOGRAPHY MARKS THE CENTENARY OF ITS LEGENDARY NAMESAKE, GRAPHIC DESIGNER HERB LUBALIN A'39

LEARN HOW TO DESTROY THE INTERNET

ERIN SPARLING TEACHES A UNIQUE COURSE IN THE SCHOOL OF ART

ROOTEDU

/AT-COOPER/SUMMER18



PHOTO DUO HERRING & HERRING TALK WITH METALLICA'S LARS ULRICH
METALLICA'S LARS ULRICH (CENTER) IN CONVERSATION WITH PHOTOGRAPHERS DIMITRI SCHEBLANOV A'05 (LEFT, WITH JESPER CARLSEN AT RIGHT) ABOUT MAKING ART AND MUSIC FRIDAY, OCTOBER 19 IN THE GREAT HALL



WATCH DANIEL ARSHAM A'03

HIS GREAT HALL PRESENTATION WAS SOLD OUT, BUT YOU CAN SEE IT VIA OUR YOUTUBE CHANNEL



MIDDLE STATES APPROVAL
COOPER UNION PASSED ITS DECENNIAL REACCREDITATION



ATHLETIC SEASONS
VIEW THE SCHEDULE AND CATCH COOPER UNION ATHLETES IN ACTION



STUDENTS TAKE TOP TWO PRIZES AT IEEE CONFERENCE
TWO COOPER TEAMS WON FIRST AND SECOND PLACE IN THE ANNUAL IEEE REGIONAL UNDERGRADUATE STUDENT PAPER CONTEST



SCHOOL OF ART FACULTY RECEIVE HONORS
PROFESSORS DENNIS ADAMS, ADRIANA FARMIGA, AND LUCY RAVEN RECEIVED PRESTIGIOUS FELLOWSHIPS AND PRIZES. EXAMPLES OF THEIR WORK ARE LEFT AND ABOVE, IN ALPHABETICAL ORDER BY LAST NAME.

SHELTER FROM THE STORM

COOPER ARCHITECTS IN PUERTO RICO

BY ANGELA STARITA



Lorena del Rio (in red) with third-year architecture students during their research trip in Puerto Rico

Housing—how to build it in a way that’s affordable, humanistic, and supportive of community—was a central question of architectural debate throughout the 20th century. Add to that list a more recent concern with sustainability in the face of climate change, and you have a complex puzzle requiring both sensitivity and practicality, a combination that, as many high-rises and housing developments reveal, has often gone missing.

Few places today demonstrate exactly how important all of these elements are to thriving communities more than Puerto Rico, where 3.3 million citizens face extreme hardship due to hurricanes Irma and Maria in the fall of 2017 and the island’s pre-existing debt crisis, which, among other factors, has hamstrung recovery efforts. Although the official death toll is 64, the *New England Journal of Medicine* reported that there were 4,600 more deaths from October to December 2017 than there were in the same period the year before. As of the end of May 2018, many people still had no running water and almost 14,000 had no power, the hardest hit being those outside urban areas. It is the longest-running major power outage in United States history.

With that in mind, Lorena del Rio, Mersiha Veleadar, and Kevin Bone, professors in The Irwin S. Chanin School of Architecture, challenged this past year’s third-year students to research, contemplate, and respond to the crisis by designing housing that included strategies to mitigate the impact of storms past and future. The studio was organized in collaboration with the University of Puerto Rico (UPR), so students



traveled to the island, where they saw firsthand some of the challenges to designing in a world of rising temperatures and debt.

“The advent of the hurricane offered an opportunity to engage in a social project that could make both immediate and long-term contributions to the island, but also to the discipline,” says Nader Tehrani, dean of the school of architecture. And the results of the studio proved him correct. Del Rio says that students responded to “the urgency of the topic” and grew passionate about the injustice of circumstances in Puerto Rico even many months after the hurricanes. One student, Dylan Dewald, describes the impact of the trip: “Visiting our colleagues in Puerto Rico made me realize how deeply rooted the problems are. Hurricane Maria is just the tip of the iceberg, as almost a century of American involvement on the island has severely limited its economic growth.”

Veledar recalls that after the faculty held workshops to plan the studio, “we agreed to follow an identical programmatic approach between UPR



and The Cooper Union, with a focus on ‘housing’ as an essential program that necessitated a new approach in the context that has endured tremendous environmental destruction.”

The studio was designed as a quick progression to give students a breadth of knowledge about the history of Puerto Rico, both natural and political. The first week, students produced context analyses in which each investigated an aspect of the island—its resources, topography, and culture—and then developed ideas about incorporating productive activities back into the urban fabric: anything from making music and art to cultivating local medicinal plants to creating locally owned

Tehrani listening to Jeremy Son AR'20 present his ideas at the class's final review

Top: Drawing by Jeremy Son of his housing scheme for a site in San Juan

business. The thinking was that since so much of Puerto Rico's culture had been subsumed by American industrial organization, locals have lost traditional forms of production and the means to provide for themselves. The coffee industry provides a prime example: coffee crops were once grown primarily for export; Puerto Ricans had to drink coffee grown elsewhere that was imported to the island. Similarly illogical arrangements inform multiple industries.

For that first project, students illustrated their findings on a host of topics, including migration patterns, agriculture, and land division in Puerto Rico. Dylan researched the island's pharmaceutical industry, which once received massive tax breaks for relocating there allegedly to create highly skilled jobs for Puerto Ricans. Dylan learned that the expected return has not been realized, and set out to create a housing scheme that builds on knowledge of traditional herbal medicine.

His classmate Zhenia Dementyeva investigated a vernacular form of gardening and farming particular to Puerto Rico called *canuco*, a technique in which discarded fabric is buried to act as an anchor for plants grown on sloped land. It's a method particularly useful for preventing erosion and catching rainwater. "This ingenious plan inspired the roofscape of my project," she says, referring to her final proposal in which she carefully calculated the amount and direction of sunlight to design where each apartment's garden would be situated.

Students also researched well-known houses and buildings largely from the 20th century, a survey that included Alison and Peter Smithson's Robin Hood Garden Apartments (1972), Luigi Moretti's Casa Il Girasole (1950), and Kazuyo Sejima and Ryue Nishizawa's Gifu Kitagata (2009). Then they embarked on a study of the specific site in San Juan and of building systems that would work best for the climate.

The site, in the east San Juan neighborhood of Turce, is divided into seven segments and includes three public schools, a park, and, on the north side, a public beach (which is rare—most in the area are open only to hotel guests). The highway Calle Marginal defines the southern boundary of the site. To the southeast is Residencial Luis Llorens Torres, the largest public housing development in Puerto Rico, with a long and troubled history of violence and drug dealing. Because of its proximity to the sea, the site is regularly flooded. After Hurricane Maria, the waters took four weeks to recede from the park.

During Cooper's spring break last March, del Rio and Veledar traveled with their students for five days in Puerto Rico, moving at a breakneck pace around the island, to see as much as possible of the landscape, housing, and culture there while collaborating with their colleagues. "They of course brought a great deal of knowledge to the table about the politics of the island as well as the housing



Photos: Mersilna Velezdar



Top: Snapshots taken of houses in San Juan
Center: A sign proclaiming "Puerto Rico Let's Move Forward!"
Bottom: Working in the UPR studio

needs of Puerto Ricans," says del Rio of the 48 UPR students.

As they traveled from San Juan to the center of the island, down to Ponce and then back to the capital, the Cooper students discovered that despite the great

damage done, scores of people have found creative ways to survive, and even more, to alter power structures, physical and political. The best example of this is Casa Pueblo, a community in the center of the island that has played a critical role in the post-Maria recovery. A coffee plantation that produces its own energy using solar panels, the collective became a haven for people who had lost power after the storm, providing them with solar-powered lights and refrigerators. Additionally, in an effort to question and even counter Puerto Rico's dependence on American industrial demands, some young people have taken up small-scale farming.

José Javier Toro, a professor from UPR's School of Architecture, helped design the course with colleagues there and at Cooper. He noticed that the two sets of students tended to create divergent solutions to the design problem at hand, though he cautioned that the work should not be compared since the two groups' approaches were rooted in very different experiences. "Naturally, the local students had lived through the difficulties during and

after the storms. This greatly affected their perspective, their studies, their capability to complete work, and perhaps made them work with a greater sense of urgency and maturity," he says. Nonetheless, he thought the camaraderie among the student groups was exemplary, and had an enthusiasm beyond that found in most studio courses.

Once back in New York, students started to design housing that would integrate their proposals for productivity now that they had visited the site. For his project, Dylan decided to invert

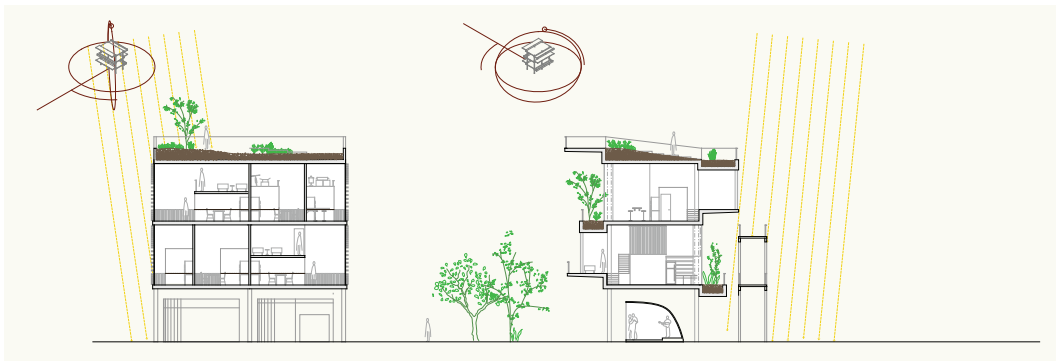
the hiring practices of pharmaceuticals that use Puerto Ricans for manual jobs, leaving the white-collar positions to outsiders. He designed social housing that, as he put it, brings "jobs that require specialized knowledge of naturally occurring medicinal herbs in Puerto Rico." He chose to work on a segment of the site that divides a wealthy, gated community from a poor neighborhood. The medicinal plants would act as a spatial and metaphoric salve for what he calls "a wound in the urban fabric of San Juan."



Cheung Lun Jeremy Son, a third-year student from Hong Kong, developed the southwest corner of the site. Inspired by Luigi Moretti's Corso Italia, Le Corbusier's Unité d'habitation, and the mobile architecture of Yona Friedman, he proposed a steel structural frame that could be arranged in multiple ways to suit changing housing, commercial, and educational needs. "The scheme is to create a structural urban framework that anticipates housing units, commercial activities, and educational institutes as an evolving mechanism that could expand or contract as necessary over time," Jeremy explains. "It is designed to be carried out periodically in phases. Residents shape their housing to their needs and thus shape their neighborhood." In addition, he sees the frame as a way for the site to remain open to the rest of the city, countering the trend toward gated neighborhoods that promote exclusivity. All public, commercial, and cultural activities were placed on the ground floor of the housing development, but living spaces were elevated for greater privacy.

Jeremy found that despite the many sources available on the internet, nothing could replace actually visiting the site. "The visit allowed me to truly understand the impact of natural forces on existing infrastructures. Through the trip, I could observe and learn about the common materials and techniques they employ that respond to their socio-economic, public safety, and climatic condition."

An exhibition of the students' work in the Houghton Gallery, "Productive Hybrids: Design III Urban Housing in San Juan," ran from April 10 to 27, letting viewers see the students' work as it developed, including their context studies and their proposals for the site. On April 24, a panel discussion with del Rio and Veledar along



Section drawings showing sunlight exposure
by Zhenia Dementyeva AR'20

Right: Model of housing scheme by Dylan DeWald AR'20



with prominent architects and planners was held in the gallery in conjunction with the studio exhibition. Moderated by Professor Diana Agrest, participants included Michael Marrella, New York City's director of waterfront and open space planning, architect Jonathan Marvel, and Catherine Seavitt Nordenson, a 1994 graduate of the school of architecture who has long been writing about and designing for coastal resilience. Tehrani says, "We took this occasion to create a smaller panel to open up dialogue on the challenges of these projects to gauge the various debates within which architecture is implicated. I would like to see other roundtables like this in the coming years."

As a native of West Bloomfield, Michigan, where the stand-alone house represents the ideal housing type, Dylan notes that the studio gave him newfound understanding of the value of the density typical of apartment living: "Social housing," he says, "gives the opportunity to create empowered spaces that are formed by the interaction between units and fosters intimate relationships among residents that solitary houses could never accomplish." The result, he thinks, is something greater than any one house or apartment: a means for building a community organized, sustainable, flexible, and self-reliant enough to better meet the physical—and political—challenges of future storms. ■

SUPPORT.COOPER.DOT.EDU

Cooper students not only excel in the classroom; they also put their talents toward competing on various extracurricular teams. The student groups benefit from generous donors who recognize the value of shared learning experiences outside the classroom.

Visit support.cooper.edu/give to make a gift and support the groups below.

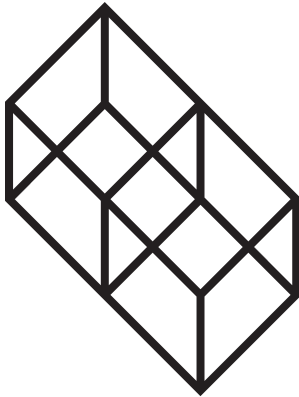
Funding helps provide construction materials and travel stipends for competitions.

STEEL BRIDGE TEAM Students design, fabricate, and build a 21-foot-long bridge made entirely of steel to compete in the Student Steel Bridge Competition, sponsored by the American Institute of Steel Construction. The bridge is judged based on its total weight, how quickly it is assembled, and how much it deflects under the applied load.



COOPER UNION MOTORSPORTS An interdisciplinary team designs, fabricates, tests, develops, and races a Formula SAE vehicle to compete against other schools at nationally sponsored events. A set of rules constrains vehicle design in the interest of making the competition as much a brain sport as it is a car race.

COOPER UNION HYPERLOOP The goal of the Cooper Hyperloop Team is to design and build the fastest Hyperloop pod to compete at the 2019 SpaceX Hyperloop Pod Competition. The competition presents an opportunity for Cooper students to apply their skills to a real-life engineering challenge.



THE COOPER UNION

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THREE QUESTIONS FOR DR. BARRY SHOOP

Barry L. Shoop's appointment as the new dean of the Albert Nerken School of Engineering was announced on May 2. Shoop, professor and head of the department of electrical engineering and computer science at West Point Academy, is a presidential appointee with Senate confirmation and holds the rank of colonel in the U.S. Army. He will begin his work here in January 2019. We asked him a few questions.

What drew you to engineering?

Growing up in rural Pennsylvania in the early 1970s—the era of muscle cars—I knew my destiny was to be an automotive mechanic. My father, who spent a career as a truck driver, recommended the field of electronics; while he was not a formally educated man, his appetite for reading led him to the conclusion that this was the field of the future. I listened to his sage counsel, enrolled at Penn State University, and promptly developed a passion for electrical engineering—one that's stayed with me ever since. Engineering is about applying knowledge of math, science, and the human condition to solve problems and create things that benefit society and humanity. Albert Einstein once said, "Scientists investigate that which already is; engineers create that which has never been." The other appealing aspect of engineering is that it is a profession that is not an individual sport but instead is a team sport. Today's engineers work in diverse, interdisciplinary, and multicultural teams solving real-world problems. I am proud to be a member of a profession that changes the world.

What has been your primary research focus?

My early research was in the area of digital communication theory and applications. Later I transitioned to photonic analog-to-digital conversion based on oversampling techniques. Then, for quite a number of years, my research focused on neural network applications to signal and image processing. More recently I have focused on innovation—in particular, understanding the ecosystems that encourage and enable the development of innovation at the organizational, geographic regional, and even national levels.

What are you most looking forward to doing once you start in your new position?

I get the most personal satisfaction when I can contribute to an organization's or individual's success. Leadership is about setting the conditions so that others can succeed. I've done that in the military, as an educator, and as a volunteer in a number of professional societies. What makes me tick and makes me happy is helping complex organizations set their course and ultimately succeed. I am looking forward to getting to know better the Albert Nerken School of Engineering faculty and students and working closely with them to chart a future path to continue to deliver the high-quality engineering education that is a cornerstone of The Cooper Union, expand interdisciplinary efforts, integrate an organizational structure and culture that encourages even more innovation, and position the college to be the recognized leader in engineering education.

