

ATCOOPER

FALL 2019 THE COOPER UNION FOR THE ADVANCEMENT OF SCIENCE AND ART





Intersection. At its most basic, the word identifies the place where two or more roads meet or cross. But more broadly, it's a concept that speaks to the possibility of connections...connections among social categories like race, gender, and economic standing or connections between disciplines like architecture, art, engineering, and the humanities. Like many of us connected to The Cooper Union, the idea of intersections is something I spend a lot of time considering and advocating for. Where is the opportunity for our teaching to intersect? What can happen when our students and faculty collaborate for a multi-disciplinary approach to learning? What can the outcome of these intersections mean for communities here and around the world? In most cases, no matter the subject, these intersections

test previously held perceptions about ourselves and the issues surrounding us; they help us redefine what's possible; they lead to new paths and new ways of thinking, of making, of doing.

In this issue of *At Cooper*, you will find the exploration of intersections is an active component of both learning and civic engagement here. In our cover story, "Climate Week x Cooper," you will read about two young women—one an engineering student, the other studying art—who galvanized their peers at Cooper and at schools throughout the city to curate a week of programming, discussions, and activism around one of the most complex issues of our time. Also in these pages is reporting on collaborative teaching approaches rooted in the Irwin S. Chanin School of Architecture and Albert Nerken School of Engineering that draw on the expertise and sensibilities of deans, faculty, and alumni across all of our disciplines to yield boundary-breaking, real-world experiences for our students and informed looks into the future of the professions.

This kind of coming together, of relying on and gaining from one another's strengths, is also at the heart of the positive momentum The Cooper Union is experiencing. We are in the midst of a tangible turnaround thanks, in part, to the generosity and support of donors—so many alumni, family members, friends, and partners who have helped us reach early, important milestones in our 10-year plan to return to full-tuition scholarships. Because of that support, and in accordance with the plan, we were able to raise scholarship levels for the 2019/2020 academic year so that, on average, 77% of tuition costs are covered for undergraduates. We accomplished that together while also holding tuition at a 0% increase. These are important steps forward for The Cooper Union, and we simply couldn't be doing it without all of you.

I look forward to the possibility of our own paths crossing in the coming year and the opportunity to share more on our progress along the way. Until then, on behalf of all of us at The Cooper Union, we wish you a joyous holiday season.

A handwritten signature in black ink that reads 'Laura'.

Laura Sparks, President

P.S. If you're in New York City, please be sure to join us for this year's "Right Makes Might" series of free public programs in the Great Hall! For all event details, go to cooper.edu/events.

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On the cover: Senior mechanical engineer Sophie Schneider at the New York City Global Climate March. Photo: Toby Cumberbatch



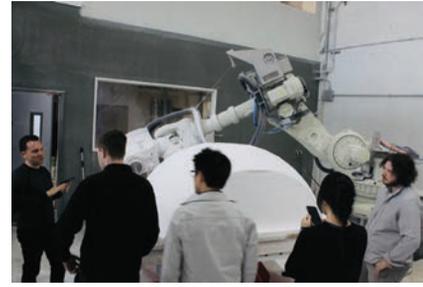
MATERIAL MATTERS

BY ANGELA STARITA

This past spring, sculptures designed by second-year architecture students were on public display in New York and southern France. The works—and their subsequent display—grew out of a course taught by Julian Palacio, adjunct assistant professor in The Irwin S. Chanin School of Architecture, with the design projects providing a medium for students to learn about the properties of structures and materials.

“It’s important for students to understand the behavior inherent to different forms and materials, because that knowledge will inevitably inform their intellectual approach to the practice of architecture. In many other countries architecture and engineering are parallel subjects, not siloed from each other,” Palacio says.

The class, Structures I, is a required course for architecture students, one of four structures classes designed to teach structural concepts and the properties of building materials. According to Nader Tehrani, dean of the school of architecture, the pedagogical philosophy of the course “is rooted in the idea of ‘learning through making.’ But of equal importance, it links construction back to the act of representation, drawing, and the generative moment. It has the advantage of advancing conceptual conjectures beyond theory and testing out iterations to better understand how those ideas transform through variations in material, size, geometry, and detail.”



Students in Professor Palacio's Structures I course worked with artists and fabricators at the North American Sculpture Center in Westbury, NY to generate the elements of their design out of EPS foam.

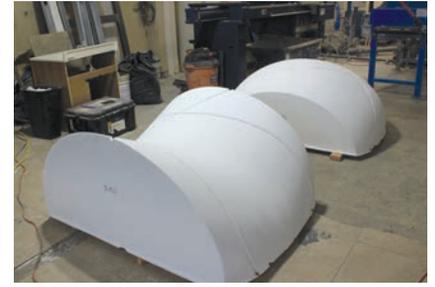
Palacio designed his Structures I course with an eye to severing the perceived barriers between architecture and engineering, subjects often treated as discrete fields despite their obvious affinities. As he notes, when we study the work of architects such as Eladio Dieste and Félix Candela it's obvious that knowledge of materials can clearly drive design, with exceptional results. In 2012, the Architectural League of New York awarded Palacio a Deborah J. Norden Travel Grant to visit Uruguay to see some of the best-known buildings designed by Dieste, who was trained as both an architect and an engineer. Dieste is best known for his Gaussian vaults, slender catenary arches made of reinforced ceramic to create thin-shell roofs. He used brick in ways rarely seen elsewhere, creating buildings that exude gravitas and agility in the same moment.

To demonstrate the power of designing through the lens of material properties, Palacio had his students divide themselves into teams to design and build architectural installations for two vastly different venues: an art gallery called dieFirma on Cooper Square and an architecture festival in Montpellier, France. The differences in location and atmosphere—the gallery is a classic white-box space, while the Montpellier group designed its piece for an outdoor courtyard—forced students to devise wholly different solutions for the two projects. One, called *Ibeji*, is a sculpture that experiments with balance. Named for mythological twins from Yoruba folklore, the sculpture is made of high-density expanded polystyrene foam and steel cables, reminiscent of both a pelvic bone and a 1970s Sculptura telephone.

“As an architect, you have to find a way to materialize your ideas. The ambition of the spring semester was to introduce a way of thinking about structures centered on their instrumentality in the production of architectural form, and the installations projects became a vehicle to challenge students to think about the physical realization of their concepts,” Palacio says.

With the help of Austin Wade Smith, an adjunct instructor at the school of architecture, students used advanced digital tools to simulate the structural behavior of their design and to find the most efficient way of fabricating it, then worked in collaboration with fabricators from the North American Sculpture Center to build the piece. The center is located on Long Island and has some of the most advanced fabrication tools available, including a 6-axis robotic arm that cut into the foam along the complex double-curved geometry of the students' design.”

According to team member Rollin Walther AR'22, “the biggest challenge of designing *Ibeji* was deciphering how its constituent parts would come together without the explicit use of glue or another binding agent. We had to come up with



NASC-Precision Stone (Julia Barricelli)

a system of friction joints that held the pieces in place while two tensioned cables wrapped around the entirety of the structure to prevent any slippage or shearing at those joints.”

Once the pieces were fabricated and brought to the gallery, the students had to craft a means for reconstructing the pieces “like a 3-D jigsaw puzzle,” says Sheri Pasquarella, of dieFirma, who noted that *Ibeji* was the inaugural exhibition of the gallery’s “soft” opening last spring. (The gallery hired two Cooper students to work as interns for the show and have since hired one of them as a part-time employee.) Standing eight feet tall, 12 feet wide, and 20 feet long, *Ibeji* filled dieFirma’s entire gallery. “A central idea to the design of *Ibeji* was the desire to push the limits of mass, weight, and balance; in other words, how you could create a physical object that seems to be in an implausible state of equilibrium,” says Palacio.

Two student designers in the dieFirma Gallery on Cooper Square with the assembled *Ibeji*.

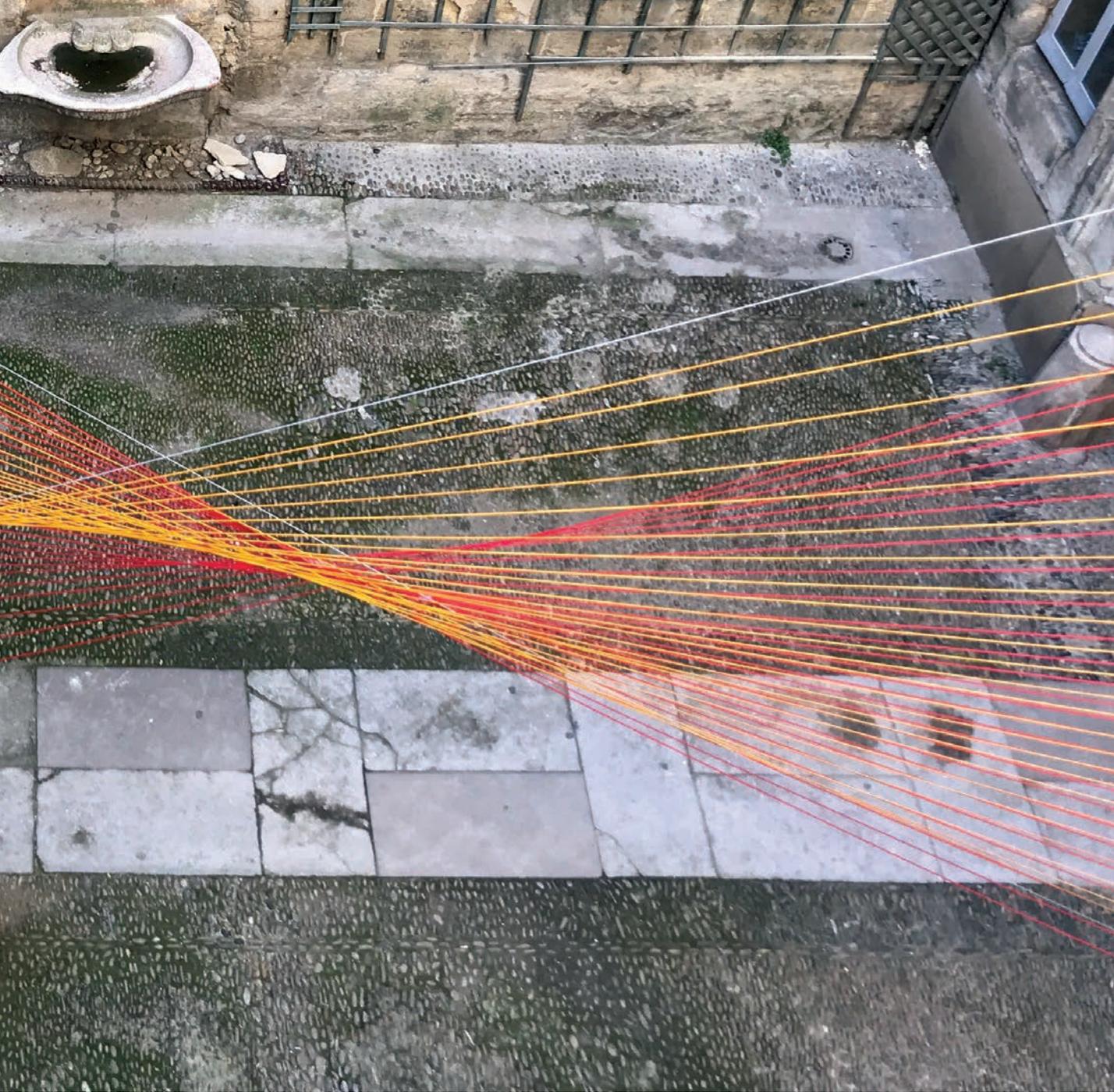


Imagen Subliminal (Miguel de Guzman + Rocio Romero)



The second group designed an installation called *Manifold/Corps et Cadre* for Montpellier’s Festival des Architectures Vives, an annual event with sculptures and installations placed in spaces that are usually closed to the public. The team—the only one composed of students invited to the festival—devised a piece made of color-coded lines made from bungee cords that stretched across the courtyard of a landmarked 18th-century mansion. The lines, strung through a metal frame, twist and cross paths to create a new portal in the center of the space through a play of geometry, light, and color.

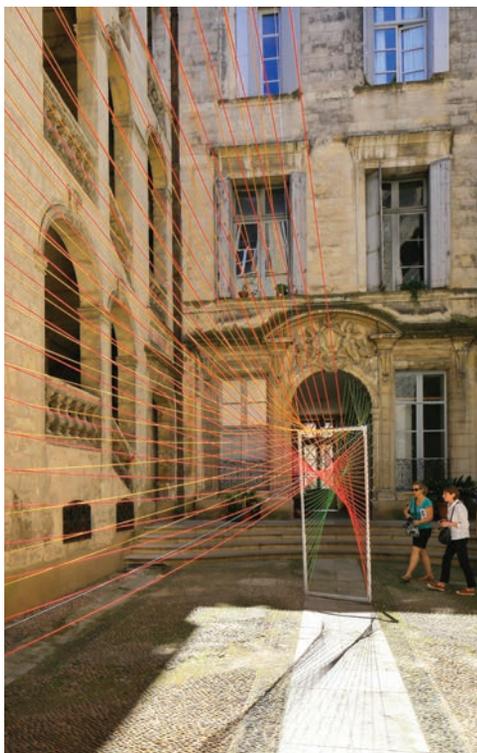
When designing *Manifold*, students knew their installation needed to be light and easy to transport to France. Four students traveled there thanks to a grant from the IDC Foundation, a New York-based philanthropy that provides grants to educational institutions in Greater New York City to advance research and the training of students



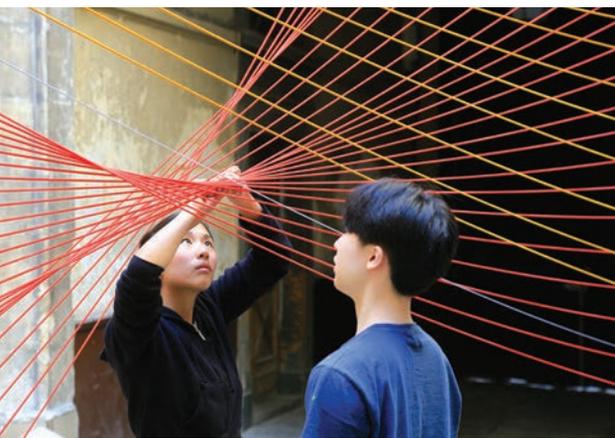
Julian Palacios



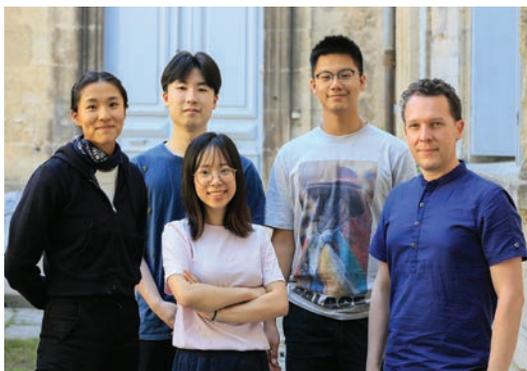
Paul Kozłowski, photoarchitecture



Students traveled to Montpellier, France to install Manifold, which they designed for an interior courtyard as part of Montpellier's annual Festival des Architecture Vives.



Manifold is comprised of bungee cords of different colors to create changing visual patterns for viewing and moving through the courtyard.



Professor Palacio (far right) with four students from the Manifold team, Annabella Chen, Anh Nguyen, Ji Yong Chung, and Chulin Yu.

in fields relating to architectural design, engineering, and building construction. But what they hadn't planned on was the unpredictability of air travel: Palacio and the students arrived in Montpellier for the festival, but luggage with essential pieces of the sculpture didn't. *Manifold* had been designed to “choreograph movement” through the courtyard, as Palacio puts it, so the team had to quickly devise a new system to work with the pieces they had on hand. Since they were unable to visit the space in advance, they had to further redesign the project to adapt to the conditions of the courtyard and address accessibility issues. “Part of the intelligence of the system that the students designed,” Palacio notes, “was its flexibility to adapt.”

The curriculum of Palacio's course squares with the school of architecture's vision for teaching structures. “We have tried to expand the pedagogy beyond number-crunching to include an expanded understanding of structural agency: through modeling, simulations, the construction of installations, collaborations, and through visiting projects in a critical moment of their construction process,” Tehrani says. “We believe that learning through making helps advance this mission.”

Known as the design/build approach to architectural pedagogy, such experiential courses are perhaps most closely associated with a program out of Auburn University called Rural Studio. Samuel Mockbee, a professor highly respected both for his teaching and for his ties to the rural communities near Auburn, cofounded the studio in 1993, asking students to build a house for a client for under \$5,000. The results were frequently brilliant—students deployed used materials such as tires and windshields in ingenious, often moving ways. Equally important, students learned to listen to the needs of the client. Despite the renown and success of programs similar to Rural Studio, some designers and architecture professors argue that not all design/build courses are created equal, with some ignoring such factors as scale, location, and the structural demands of architecture.

Tehrani points out that during his architectural training, the science of materials was not part of the required curriculum. His own teaching philosophy



During the architecture festival, some private buildings are open to the public. Visitors had a chance to experience "Manifold" while moving through the courtyard of one of the city's landmarked 18th century mansions.

has been partly dedicated to explicating the role of materials and the construction industry to his students. "But," he adds, "my initiative was not only to advance research in making, through 'shop,' but also to hone the intellectual frameworks through which it would be supported in history/theory, in structures, and in building technology courses. Beyond getting students acquainted with 'calculations,' [the Structures course] is a way to advance their structural thinking through mock-ups, material testing, and the 'installation,' effectively honing their structural intuition."

For Rollin, currently a third-year architecture student, the course methodology gave him insight into the relationship between models and built structures. "I was astounded when I first saw the final unassembled pieces [of */beji*] because first, I had never seen any project I had participated in realized to its intended scale, and second, my perception of its size and weight were completely skewed," he says. "This allowed me to begin addressing how digital design and 3D modeling can never truly describe how a structure will appear, behave, and react in physical reality." ■



Photos: Paul Kozlowski, photoarchitecture

CLIMATE WEEK x COOPER

A recent *New Yorker* cartoon showed Greta Thunberg as Prometheus, bearing the world on her shoulders with the caption “Somebody’s got to do it.” At Cooper, two students have taken on the same challenge. Alisa Petrosova, a junior in the School of Art, and Sophie Schneider, a senior in the Albert Nerken School of Engineering, decided to organize Cooper Union x Climate Week, a series of events designed to raise the consciousness of the school community about the urgency of the climate crisis, which included participation in the September 20 Climate Strike.

Working with Amanda Simson, an assistant professor of chemical engineering, the two students spent six months organizing the week; it started on September 17 with a lecture by acclaimed author Naomi Klein, whose most recent book, *On Fire: The (Burning) Case for a Green New Deal*, addresses the climate crisis. A packed audience in the Great Hall listened to Ms. Klein in conversation with activist Varshini Prakash. Another night, noted author and environmentalist Bill McKibben took to the Great Hall stage to have an insightful discussion with Dr. Ayana Elizabeth Johnson, a marine biologist and policy expert. They discussed the histories of climate revolutions—including scientists who had determined the dangers of carbon emissions long before our era. (Both events can be viewed on Cooper’s Youtube channel, [youtube.com/cooperunion](https://www.youtube.com/cooperunion).) Of course, Cooper’s own faculty is deeply engaged with these questions, so it was fitting that one of the week’s final events included a discussion among Fia Backström—artist and new member of the Cooper art faculty—artist Gabriela Salazar, and Omar Berrada, an adjunct instructor and co-coordinator of the Intra-Disciplinary Seminar Lecture Series. The three discussed why issues related to the ensuing crisis are central to their practice.

For Alisa and Sophie, the week’s events were only an opening salvo for motivating substantial change at Cooper. For one thing, they would like to see the curriculum of all three schools better address the impact of global warming. Although both women became activists as a result of classes they took at Cooper, they feel that too few courses address the problem. Alisa would like to see more students have the chance to understand the urgency of the crisis. She said in one of her classes she learned a terrifying message: “Many important things would be ending within my lifetime—bees, clean water, relative peace, and the luxury of complacency.”



Activist Varshini Prakash with author/activist Naomi Klein



Marine biologist Dr. Ayana Elizabeth Johnson with environmentalist Bill McKibben



L to r: School of Art Adjunct Professor Omar Berrada, artist Gabriela Salazar and artist and School of Art Assistant Professor Fia Backström

Photos: Marget Long

Alisa Petrosova (above right, with Bill McKibben) and Sophie Schneider (at right, with Dr. Johnson) organized an exhibition of student work as part of Cooper Union x Climate Week. Located on the fifth floor of the foundation building, it included student works from all three schools.



Approximately 70 Cooper Union students, faculty, and administrators marched from Foley Square to Battery Park City to participate in the worldwide climate strikes. President Laura Sparks (at right) participated, as did Amanda Simson and Ben Davis (above), both members of the chemical engineering faculty.



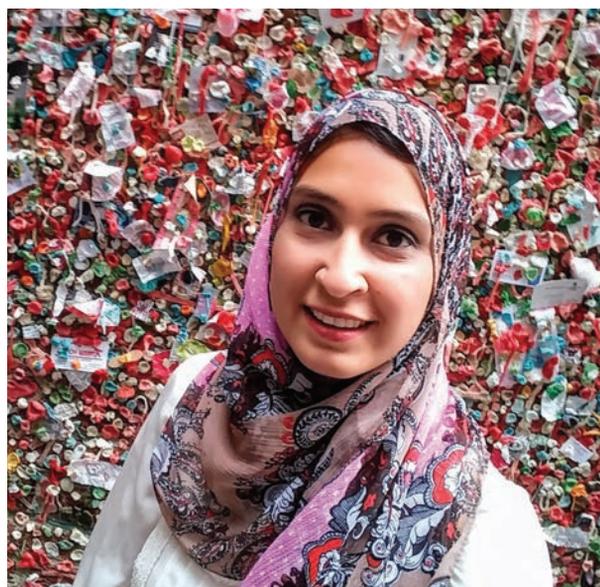
Photos: Toby Cumberbatch



COOPER WELCOMES NEW FACULTY...

Academic search committees across The Cooper Union have been busy over the last year working to identify leading candidates to fill several full-time faculty positions. This semester, the academic community welcomes one new assistant professor in the Faculty of Humanities and Social Sciences, four full-time faculty members in the School of Art, and two assistant professors in The Irwin S. Chanin School of Architecture, each bringing a wealth of expertise in disciplinary research, teaching, and practice.

FACULTY OF HUMANITIES AND SOCIAL SCIENCES



Loujaina Abdelwahed

Loujaina Abdelwahed joins HSS as a new full-time assistant professor of economics. She earned her doctorate at the University of Illinois at Chicago. Her research includes work in international development and empirical macroeconomics, with a specific focus on windfalls from foreign aid and natural resources and their impact on fiscal policy in developing countries. She received her B.A. and M.A. in economics from the American University in Cairo. Abdelwahed previously worked as an economist at the Macro Fiscal Policy Unit in the Egyptian Ministry of Finance, where she was responsible for projecting the government debt and domestic and foreign interest payments over the medium term.

On joining Cooper, Abdelwahed says, she is most drawn to the emphasis on liberal arts education alongside professional training in architecture, art, and engineering: “It is important to be exposed to a wide range of disciplines to broaden your horizon.” She was also immediately impressed by the caliber of students and their willingness to explore areas outside their disciplines. “I am looking forward to more interaction with such a talented pool of students,” she says. “In addition to teaching, I look forward to working on research projects with students who might be interested in exploring economics as a potential field for graduate school.”

“In addition to teaching, I look forward to working on research projects with students who might be interested in exploring economics as a potential field for graduate school.”



Fia Backström

SCHOOL OF ART

Fia Backström is an interdisciplinary artist and writer whose work employs disparate media from a wide range of sources to explore what constitutes collective subjectivity and the social bond. Her work frequently moves between ecological scales with fluency—in one moment exploring global environmental degradation, in another searching for its traces in the human body. She represented Sweden in the Venice Biennale 2011 and was included in the Whitney Biennial 2008 and in Greater New York—MoMA PS1. Her work has been shown in numerous international institutional exhibitions, including at New York’s Museum of Modern Art, the Centre George Pompidou in Paris, Stockholm’s Moderna Museet, and the Serpentine Gallery in London. In 2018 she received the Bernard Heidsieck Literary Prize—Centre Pompidou.

As a teacher she values a classroom that eschews hierarchy while promoting creative forms of collaboration as students make physical work or performance-based work. Noting the draw of live performance, she says, “I think presence is increasingly important as we are moving into deeper digital experiences. I think there is a desire and longing for people to be in the same room and for bodies moving and voices articulating.”

She joins Cooper as an assistant professor of art and hopes to provide students with a model for being an artist responding to the world’s circumstances, so they can become the artists they are supposed to be. She anticipates that her students’ ideas will likewise inform her art: “I hope to learn from their generational experiences and perspectives and specific understanding of the world and of art.”

“I think there is a desire and longing for people to be in the same room and for bodies moving and voices articulating.”

This fall, interdisciplinary artist **Coco Fusco** joins the School of Art faculty as guest associate professor. Her video and performance work, often the result of extensive archival research, investigates the continued impact of colonialism on power and knowledge; the intersection of gender and militarism; and globalism’s role in reinforcing stereotypes. For one of her best-known works, “The Couple in the Cage: Two Undiscovered Amerindians Visit the West,” Fusco collaborated with Guillermo Gómez-Peña to stage a performance where they played two people from a fictive island in the Gulf of Mexico on public view in a cage. Using the 19th-century practice of displaying colonized peoples as objects of both scorn and desire, the piece demonstrated how the category of science has been manipulated to reflect racist and sexist ideas that inform knowledge today.

She recently noted that academic institutions’ positions toward performance as art have changed radically over the last twenty years. “In the ’90s I had to struggle to put a performance course into the curriculum of the school where I taught,” she says. “Now it’s expected that courses will be offered and students are exposed to more performance. I think it is great that institutions are catching up!”

“Now it’s expected that courses will be offered and students are exposed to more performance. I think it is great that institutions are catching up!”

Coco Fusco



Writing is an essential part of Fusco's practice. Her publications include *English Is Broken Here: Notes on Cultural Fusion in the Americas* (1995), *The Bodies that Were Not Ours: And Other Writings* (2001), *Dangerous Moves: Performance and Politics in Cuba*, other books, and dozens of articles.



Cristóbal Lehyt

“Performance is particularly well positioned in making an encounter a significant lived experience.”



“Doug Ashford”

Cristóbal Lehyt, an artist hailing from Chile and educated there and in New York, has joined the School of Art as an assistant professor. His work, which has been collected by the Museum of Modern Art and the Museum of Contemporary Art in Chile, includes drawing and painting (frequently of spectral figures floating in space), sculpture, and photography. Regardless of medium, his art raises questions about the limitations of representation—be it visual or linguistic—and the ways that mythology and other forms of received knowledge further obscure understanding. Not surprisingly, in the classroom Lehyt is dedicated to transparency. He strives to make his classroom “as open as possible.” He says, “it is important for me to historicize and contextualize the different aspects of their practice and ask them what they want their work to be—give them as many possibilities as I can, based on what is important to them. All of this while stating positions I think are crucial for them to consider.”

Much of Lehyt's practice forces viewers to be conscious of themselves in relation to the art. As part of “Weaving In & Out,” an exhibition at Tapestry in East Harlem, he leaned his photographs of northern Chile against the wall and placed them at a 45-degree angle, making viewers aware of each photo as an object in itself. For “Iris Sheets” at the Americas

Society, he constructed an accordion fence out of sweetgum and oak logs that had been soaked in Chilean red wine. Visitors had to navigate through them to see the other works on view. His strategies are born from a belief that presence is crucial in all art mediums, and that “performance is particularly well positioned in making an encounter a significant lived experience.”

Doug Ashford, formerly a proportional-time faculty member, is now an associate professor of art. He is a 1981 School of Art graduate and has taught here since 1989. Doug's principal art practice from 1983 to 1996 was Group Material, an art collective that used exhibition design and social practice in museums and other public spaces to imagine new political forms. Teaching in the Saturday Program as a student in the early 1980s inspired Ashford to explore how understandings of art and political liberation are joined. First as an art teacher in the New York City public schools and then as a member of Group Material, he has always been striving in his work to reform the failed exclusivity of the art museum and other institutions.

“The history of the Saturday Program is one of thoughtful reflection and action in the face of the cultural disenfranchisement of most American artmaking.”

“The Saturday Program was my introduction into the inequities and debt that the system of higher education reproduces,” he recalls. “The history of the Saturday Program is one of thoughtful reflection and action in the face of the cultural disenfranchisement of most American artmaking. And now, 50 years after its founding by students of The Cooper Union, the results are clear. Our school, other schools, our museums, and the cultural apparatuses of NYC itself are all partially transformed. But this work is far from finished.” Ashford says his students want to pursue their artistic practice without it being an economically managed category of experience or adhering to institutional logic. “This allows the class to consider what we don’t yet know or want, or don’t yet know we need: things beyond the ethical failures of society that we are experiencing today.”



Nora Akawi

“In my teaching, I aim to work with students on questioning established repertoires and archives of architectural canons...”

THE IRWIN S. CHANIN SCHOOL OF ARCHITECTURE

Nora Akawi joins Cooper as an assistant professor of architecture. She is a New York-based architect whose work is focused on the various forms of exclusion orchestrated by contemporary colonial powers and their implications in architecture design, history, and representation. Prior to joining The Cooper Union, Akawi taught graduate urban design studios and history/theory courses at the Graduate School of Architecture, Planning, and Preservation (GSAPP) at Columbia University. Beginning in 2012, she served as director of Studio-X Amman with the Columbia Global Centers | Amman and Columbia GSAPP, where she led public programming, educational, exhibition, and publishing projects focused on architecture in the Arab world.

Akawi explains that she sees the academic institution as a space for students to travel through and learn from—and one where they can imagine other modes of existence. “In my teaching, I aim to work with students on questioning established repertoires and archives of architectural canons, especially those that participate in centering exclusive and exploitative modes of inhabitation.” She is also looking forward to collaborating on shared projects with students and colleagues in the fields of architecture, art, engineering, and the humanities: “The Cooper Union has been leading by example not only as an institution that offers the highest levels of learning, but also as an environment that foregrounds civic engagement, access to education, and academic freedom. I’m grateful and honored to join the school of architecture faculty at Cooper, a program I’ve admired since my introduction to the field of architecture.”

“I think it’s an exciting time for the school of architecture because there’s such an amazing collection of faculty members.”

Lydia Kallipoliti also joins Cooper as a new assistant professor of architecture. She is an architect, engineer, and scholar whose work focuses on the intersections of architecture, technology, and environmental politics.



Lydia Kallipoliti

She has taught at Cooper as an adjunct assistant professor and returns now after serving as an assistant professor at both Rensselaer Polytechnic Institute, where she directed the master’s program in architecture, and at Syracuse University. Previously at Cooper she served as a senior associate at the Institute for Sustainable Design and as the Feltman Chair in Lighting. Kallipoliti describes herself as a “mixed breed” of engineer and architectural historian. “It’s a field of discomfort because I have both a technical and a scholarly background, but I’m motivated by this discomfort.” Her research has led her to collaborate frequently across disciplinary boundaries: “Being part of a humanities community and going to conferences as a theorist, but also working with scientists, genetic engineers, and biologists—that really excites me.” In the classroom, Kallipoliti prefers to engage her students through project-based work. “I think this motivates the students, to have some scope beyond instruction, where the course is a collaborative platform or a think tank for producing a project, whether it’s an exhibition, an article, or a book project.”

“I love The Cooper Union,” she says. “I love the fact that it is one of the only institutions that will eventually return to providing full tuition. It has a very special history. I really love that there’s a diverse student body and that the students somehow have the spirit of The Cooper Union inside them, the traditions and legacies that remain very much alive. I think it’s an exciting time for the school of architecture because there’s such an amazing collection of faculty members.”

...AND INTRODUCES NEW DEANS

Faculty of Humanities and Social Sciences, The Irwin S. Chanin School of Architecture, and Albert Nerken School of Engineering strengthen their administrations to better support diversity and learning.

Anne Griffin has assumed the role of Acting Dean of Humanities and Social Sciences, succeeding Peter Buckley who stepped down from the position at the end of the semester this past May. Griffin has been a full-time faculty member in HSS since 1978, teaching both the core curriculum and advanced electives in political science. Most recently, she successfully chaired the HSS faculty search and served on the 2019 Cooper Union Grant Review Committee.

Griffin will also serve as Acting Dean while the Council on Shared Learning completes its work and makes recommendations on how best to address issues of diversity, decolonization, and pedagogy within the curriculum. The council will seek to elevate the Humanities and Social Sciences which, according to Laura Sparks, are a “critical element of our students’ academic community, as it is in these classrooms where all of our students come together, regardless of professional discipline.”

Nada Ayad has returned to Cooper as the new Assistant Dean of HSS, a position that was created this semester to assist the faculty’s efforts on addressing those issues of diversity and decolonization. Ayad was a postdoctoral fellow in comparative literature at Cooper before taking a role as assistant professor of world literature at the Fashion Institute of Technology in 2018. Her research focuses on 20th and 21st century Arabic literature, women of



Anne Griffin



Nada Ayad



Hayley Eber



Lisa A. Shay

color feminisms, theories and literatures of decolonization, and translation studies. She has also translated contemporary cultural texts from French and Arabic.

In her new role, Ayad will support the dean's office as a resource for faculty and staff; provide support and leadership by partnering with faculty on issues of diversity and decolonization; support faculty, staff, and student diversity and inclusion efforts across the institution; and also provide leadership support for evolving Cooper's interdisciplinary learning initiatives.

Hayley Eber has joined as the new Assistant Dean of The Irwin S. Chanin School of Architecture. Eber is an architect, designer, and educator who teaches as an adjunct professor at The Cooper Union and is the principal of Studio Eber (formerly EFGH). She has stepped in to fill administrative duties as Elizabeth O'Donnell prepares to transition out of her current role as associate dean.

Eber previously worked at Diller Scofidio + Renfro in New York, where her experience ranged from temporary installation and media work, performance, architectural competitions, and large-scale urban projects, most notably the High Line. Prior to joining DS+R, she worked at Eisenman Architects in NY on The Arizona Cardinals Stadium and the Holocaust Memorial in Berlin and at Wiel Arets Architects in Maastricht on the Utrecht University Library. She holds a Masters in Architecture from Princeton University School of Architecture, a Bachelors of Architecture from The Cooper Union, and a BAS from the University of Cape Town. She previously taught at Princeton University (2013-19) and Columbia University GSAPP.

Lisa A. Shay joins as Associate Dean for Educational Innovation at the Albert Nerken School of Engineering. She comes to Cooper from the U.S. Military Academy at West Point, where she was Director of the Electrical Engineering Program, with responsibility for ten military and civilian faculty who taught 30 electrical engineering courses to over 500 cadets each year and administered 14 laboratory facilities with equipment valued at more than \$10 million. She was also Chair of the Laboratory Resources Committee responsible for managing all laboratory equipment across ten academic departments.

Shay recently retired from a distinguished career of 30 years in the United States Army. During this time, she served in numerous leadership positions while stationed in the United States and abroad. She retired with the rank of colonel. Shay has authored three book chapters, a *Michigan State Law Review* article, and over 30 articles in peer-reviewed journals and conference proceedings. She pursues interdisciplinary research among the fields of engineering, education, law, policy, and ethics. Her interests include developing and using technology to benefit society and humanity across the world and developing engineers who act with a sense of civic responsibility and social justice. ■

ONCOOPE



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4 Cooper Union	4 Yale University
5 Syracuse University	5 Cornell University
6 Virginia Tech	6 Princeton University
7 Pratt Institute	7 Rice University
8 California Polytechnic State University, San Luis Obispo	8 Massachusetts Institute of Technology



CLASS NOTES
JAY MYSELF, THE 2019 DOCUMENTARY ABOUT JAY MAISEL CERT'52—ARTIST, PHOTOGRAPHER AND RESIDENT OF THE 36,000 SQ-FT, 100-YEAR-OLD LANDMARK BUILDING AT 190 BOWERY. AVAILABLE ON VARIOUS STREAMING SERVICES

CHANIN SCHOOL IN TOP FIVE
A DESIGNINTELLIGENCE'S SURVEY RANKS THE MOST ADMIRABLE SCHOOLS FOR ARCHITECTURE

R ROOTEDU

/AT-COOPER/FALL-2019



AFTER 23 STATUES OF MEN, CENTRAL PARK GETS FIRST SCULPTURE HONORING WOMEN

MEREDITH BERGMANN'S A'77 BRONZE OF SOJOURNER TRUTH, ELIZABETH CADY STANTON, AND SUSAN B. ANTHONY, WILL SIT ON THE LITERARY WALK BEGINNING AUGUST 2020



LOOK BACK: END-OF-YEAR '19

PHOTOS FROM THE 160TH COMMENCEMENT AND HIGHLIGHTS OF THE CREATIONS THAT FILLED THE CLASSROOMS, STUDIOS, AND HALLWAYS THIS PAST EOYS



THE COURTROOM

A RE-ENACTMENT OF DEPORTATION PROCEEDINGS

TEXT ARRANGED BY
ARIAN MOAYED

DIRECTED BY
LEE SUNDAY EVANS



RIGHT MAKES MIGHT SEASON | THE GREAT HALL

FREE EVENTS INSPIRED BY THE POLITICAL COURAGE AND MORAL VISION OF LINCOLN'S FAMOUS COOPER ADDRESS—SEE *THE COURTROOM*, MONDAY, DECEMBER 9 AT 7 PM



CLASS NOTE

AVITAL SAGALYN CERT'46 PRESENTS HER FIRST MUSEUM EXHIBITION AT THE UNIVERSITY MUSEUM OF CONTEMPORARY ART IN AMHERST, MA

ENGINEERING WITH A CONSCIENCE

BY MATTHEW BOWER

This fall, Sam Keene, an associate professor of electrical engineering, is co-teaching a course called *Hiding from the Eyes of the City* with Benjamin Aranda, an assistant professor of architecture. The new seminar delves into the politics and social impact of advances in surveillance technologies. “We can imagine an arms race where facial-recognition technology is improving and people’s methods to defeat it are improving,” says Keene. “We’re postulating this scenario where only the wealthy can avoid surveillance, and there’s a total surveillance state for everyone else. How is that an equitable society? What does that mean for public spaces if only certain people can move through them completely undetected while everyone else has all of their movements tracked?”

The course is only one of the many avenues available to Cooper students for grappling with the ethics of new technology. And it’s not just for those studying engineering; essential to the discussion is interdisciplinarity. “The issue with new technology is that it’s not just about science, engineering, and mathematics,” says Birgitte Andersen, CEO of the London-based think tank Big Innovation Centre. “It’s really about complex problem solving. It’s about creativity, it’s about people management, it’s about emotional intelligence.”

Andersen was one of a panel of experts who came to Cooper last February to discuss the future of the workforce: Are robots going to take our jobs? Will new technologies create more economic opportunity, or drive unemployment and inequality? How should institutions of higher education prepare students to lead in a workplace transformed by automation? Raising such questions is the goal of Mark A. Vasquez ME’88, program manager for the TechEthics program of IEEE, the world’s largest professional organization advancing technology for humanity. They co-sponsored the panel, which is part of the larger vision that Barry Shoop, dean of the Albert Nerken School of Engineering, has brought to the school since joining it last winter: giving Cooper students new learning opportunities in the ethics of technology.





Photos: João Enxuto

Students testing facial recognition software in *Hiding from the Eyes of the City*, a course co-taught by Benjamin Aranda, associate professor of architecture, and Sam Keene, associate professor of electrical engineering and the 2019 C. V. Starr Distinguished Professor.

“We’re postulating this scenario where only the wealthy can avoid surveillance, and there’s a total surveillance state for everyone else. How is that an equitable society?”

Like Andersen, Shoop believes that preparing students to work with emerging technologies requires teaching them how to engage with problems from outside perspectives. “I think it’s important you have these discussions across disciplines,” he says. “As an engineer, I have a certain set of ethics, but when you bring a philosopher into the equation, that is a much richer description, a much richer conversation about ethics and how it applies to technology.” While job prospects in fields such as robotics, artificial intelligence (AI), data science, and machine learning have exploded in recent years, educators and employers alike are seeing the importance of combining STEM training with the “soft skills” traditionally associated with liberal arts and humanities majors.

Granted, ethics has always been an important part of engineering, as Shoop is quick to point out. Codes of ethics are part of both the accreditation process for engineering schools and the membership requirements for professional societies such as IEEE. So what’s changed in recent years? “I think from my perspective what has really brought things to the forefront is the autonomy we’re beginning to see that results from new technology,” he says. “What I’ve seen in ethics has

Opposite page, left to right: Mark A. Vasquez ME’88, program manager for IEEE TechEthics; Birgitte Andersen, CEO of Big Innovation Centre; and Barry Shoop, dean of the Albert Nerken School of Engineering.



surprised me a little bit because when you start building these autonomous systems, there's much more than just the question of right and wrong in terms of what the system is doing." One particularly nuanced area of ethical concern, he says, is the problem of unintended and implicit bias, which can influence the decisions made by algorithms.

Starting this semester, the school of engineering will offer an official minor in computer science, a field where the dangers of bias are especially pronounced. As the application of big data and machine learning becomes more pervasive, ethicists are drawing attention to unintended racial and social biases that can creep into statistical models, which hold serious consequences for everything from screening job applications to assessing insurance risks to policing to predicting recidivism—all areas where decision-making is increasingly being delegated to algorithms. Shoop sees problems such as these motivating a shift to rethink and expand the role of the engineer.

"When I came out of Penn State in 1980, an engineer was an engineer," he says. "Now, employers are asking engineers to have a conscience, to understand more about the ethical considerations of what they're doing and the broader environment." But what does broadening engineering education to incorporate more of the humanities mean for a profession largely organized around deep technical specialization?

"In part, IEEE TechEthics aims to help bridge the gap between those who are deeply immersed in technology and those who are part of the conversation but are not necessarily technologists themselves," says Vasquez, who is also a member of the Cooper Union Alumni Council. This extended audience includes stakeholders such as philosophers, sociologists, entrepreneurs, policy-makers, and the general public. "From a professional perspective, we're interested in bringing the dialogue forward so we can have a very comprehensive and sound conversation on a variety of technology areas. Technologists are always at the core of the discussion. By adding multiple voices to the conversation, we seek to balance the misinformation and sensationalized manner in which technology information is sometimes delivered."



Using masks and cutout facial features, students test ways of disguising themselves from facial recognition systems.

“Cooper is a place where people come for public discourse, and the kinds of topics we’re talking about lend themselves to engaging with the public.”

The IEEE Global Initiative on Ethics of Autonomous and Intelligent Systems is another effort launched as part of IEEE’s mission of advancing technology for humanity. The Global Initiative promotes dialogue among practitioners about the ethics of AI and other decision-making technologies. This initiative has published *Ethically Aligned Design*, a set of crowdsourced recommendations for industry compliance standards and best practices; its second edition places greater emphasis on understanding global perspectives and cultural differences. “IEEE publishing its second version of *Ethically Aligned Design* has really brought ethics forward in the industry,” notes Shoop, who served as the professional organization’s president and CEO in 2016. IEEE TechEthics has similarly championed efforts to diversify represented viewpoints, with panelists from across the globe included as part of their regularly scheduled online and in-person events, where various challenges in the technology ethics space are discussed.

Turning to his alma mater to co-sponsor events, Vasquez says, is a no-brainer. “Cooper is a place where people come for public discourse, and the kinds of topics we’re talking about lend themselves to engaging with the public.” With alumnus Stephen Welby ChE’87 serving as IEEE’s current executive director and chief operating officer, the connection to Cooper has been a fruitful one lately. Last May, Cooper hosted a talk focused on AI, ethics, and healthcare that featured the executive director of the IEEE Global Initiative. Vasquez is also working with the school of engineering to plan additional IEEE TechEthics co-sponsored panel discussions in the 2019–2020 academic year. The next one will take place in November and will focus on autonomous vehicles and self-driving cars.

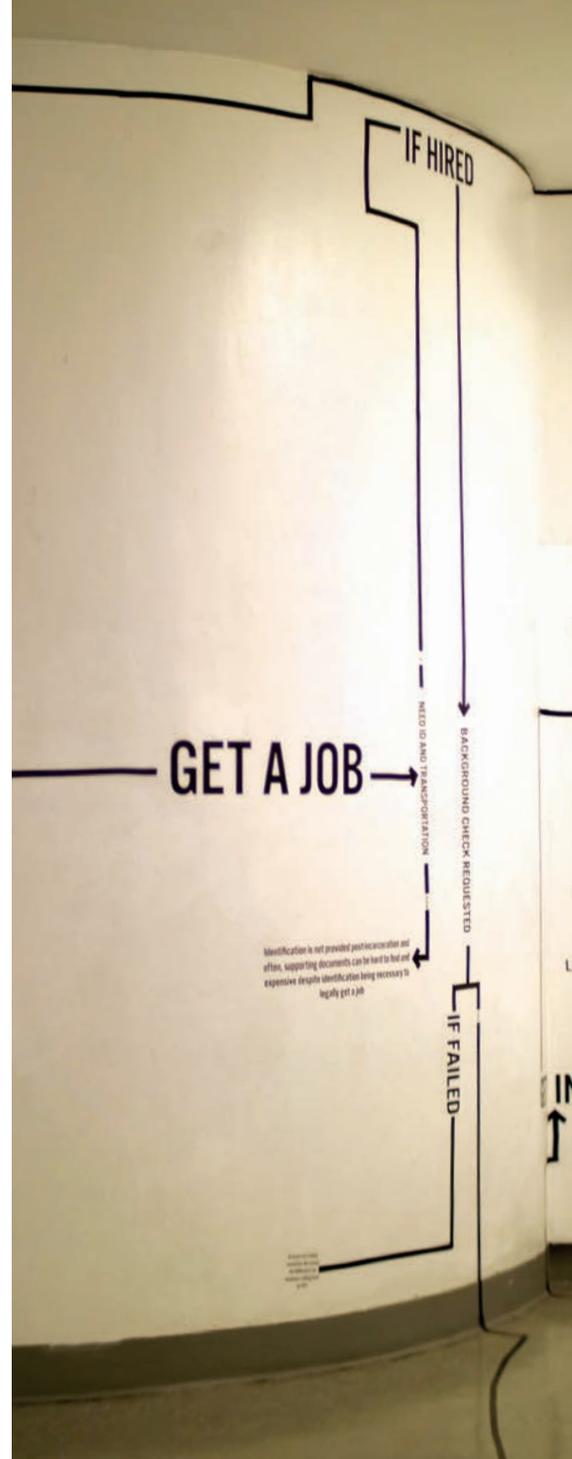
Keene, the co-teacher of *Hiding from the Eyes of the City*, has been working for several semesters to bring engineers, architects, and artists together in the classroom. Previously, he taught Machine Learning and Art, which he co-taught with artist and

writer Ingrid Burrington, and Data Science Projects for the Social Good, co-taught with Will Shapiro AR'11, the founder and chief data scientist of a company that uses AI to understand cities, and later with Taylor Woods A'15, a designer and illustrator.

The goal of Keene's current course will be to build and present an interactive demo at the Shenzhen 2019 Bi-City Biennale of Urbanism/Architecture in China, inviting participants to input photos of themselves into a database and try different methods of concealing themselves from the facial-recognition technology. "If you put a mask over your face, you might be invisible to the system, but from a human perspective it will be obvious that you're trying to avoid it. If you're more subtle, if you just have a pin or a texture or something that's less observable to you and me but that makes you invisible to the system, that is extremely valuable." The class includes a group of electrical engineering students, who are building the facial-recognition technology, and a group of architects, who are designing and fabricating the exhibit. "You've got engineers and architects in the same classroom talking about this technology, asking what are the political ramifications, how do you design an exhibit around it," Keene says.

One unusual aspect of the project is that, although it raises questions about surveillance and government overreach, it cannot explicitly reference the current political situations in Hong Kong and China. A ban on wearing face masks in public in Hong Kong, enacted under an emergency powers law, has just recently exacerbated the semiautonomous territory's ongoing political unrest. "We have to submit the project to a Chinese cultural committee, which is essentially a censorship board," he says. "So even though we're accepted to this biennial, we still don't know if it's going to happen, if it'll get approved."

From Keene's perspective, thinking about the ethics of technology means going beyond liability and industry compliance frameworks and bringing it into the context of contemporary issues and the tangible impact that engineering has on the world. "In my machine learning class especially, we spend time on social problems and unintended consequences related to communications and networks. When they first envisioned the Internet, for example, it was designed as a network of



Ultimately, the question Keene wants engineering students to ask in their design choices is not just “How do we make that?” but “Should we make that?”

open and trusted computers working together benevolently. We talk about how incorrect their assumptions were, and now all those things are built into the architecture of the Internet, which is why security is such a problem now. It was never fundamentally built to be secure.” Ultimately, the question Keene wants engineering students to ask in their design choices is not just “How do we make that?” but “Should we make that?”

It’s a question that was often raised in the Machine Learning and Art course. Co-teaching with an instructor from outside his discipline, Keene says, helped change his own perspective, and in turn he saw engineering students thinking more critically about design choices. As a result of that experience, Keene asked Burrington to teach Ethics of Computer Science, a new course being offered this semester that challenges students to explore the historical and ethical dimensions of living in a world governed by computers.

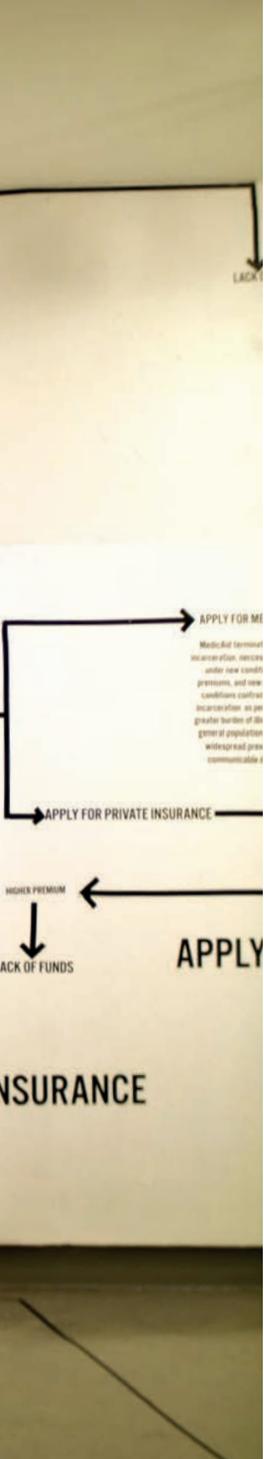
Keene hopes to create additional opportunities this spring for both the Cooper community and the general public to learn about emerging technologies. He and Taylor Woods want to host a series of talks by guest speakers with expertise in data science, data visualization, design, ethics, and other topics related to their Data Science Projects for the Social Good course. They received funding for the series last semester through the new Cooper Union Grant Program.

Similar pushes for cross-disciplinary conversations about technology have come both from outside the school of engineering and from the students themselves. “A group of students approached me and asked if I would teach a course on the ethics of AI,” says Sohnya Sayres, an associate professor of humanities. As a result, Sayres is teaching a course this semester called Artificial Intelligence and Ethics. But rather than focusing solely on applied ethics, Sayres wants students to ask bigger, more-speculative questions about the nature of intelligence, automation, and technology.

“Technology always presents itself as solving all our problems,” says Sayres. But of course, it also raises new problems—and questions—of its own. “What do we mean when we talk about human or artificial intelligence? What do we mean by a just world?” she asks.

For the Faculty of Humanities and Social Sciences (HSS), all this buzz about the ethics of emerging technologies comes at a time of renewed focus on the role of the curriculum in preparing students as critical thinkers and civic-minded practitioners.

Aden Bailey A'19, Ariana Freitag EE'20, and Sophie Schneider ME'20 created a room-sized flowchart for their 2019 Data Science Projects for the Social Good course.



Elevating HSS as an integral part of professional education at Cooper is one of the main charges of the Council on Shared Learning, a committee of students, faculty, and administrative staff members that was formed last semester, partly in response to various student groups voicing concerns about diversity and decolonization within the academic community. Anne Griffin, professor and newly appointed acting dean of HSS, believes the time has come to enrich the curriculum with courses that draw discourse and knowledge from across disciplines and traditions.

“I would like to see HSS faculty take a greater role in interfaculty exchange and collaboration and in developing intersectional courses,” she says. Automation technologies are one of the areas where, she says, there is the necessity and opportunity for exchange. “We talk about technology and society as if they are two different things, but there are so many ways that they intersect—socially, politically, physically. There is room for generalists because we need to increase our generalized knowledge as the world becomes more technological.” A major part of that, she adds, is making room for serendipity. “There needs to be surprise in the curriculum. Students need to be surprised, to learn something they might not otherwise have had the chance to learn.”

In Griffin’s view, despite its professional orientation, Cooper provides fertile ground for experimentation. “Such a small school makes it possible to have these conversations between engineering and humanities. We each have our specializations, but we are not so rigid that we can’t stray.” ■

“

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—John Clarke AR’66

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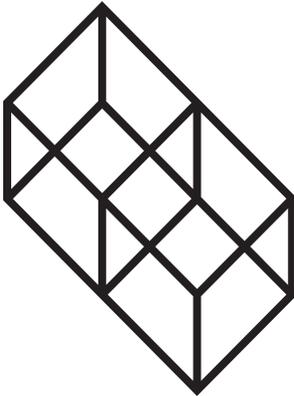
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