The Pioneer

FREE COOPER SHINES RED ONCE MORE

ANUSHREE SREEDHAR (ChE '18)

The close of the semester saw Free Cooper Union's final student action for the year, the first year of Cooper's half-tuition policy. From the red lights that glowed throughout the freshman dorms, to the global press received esteemed feature in Humans of New York, Free Cooper finished last semester with a bang. On December 8, 2014, the traditional Cooper Union flag on the Foundation building was replaced with a fiery red flag as a reminder that the fight for Cooper and for higher education continues. Inspired by the Quebec student protests of 2012, the red motif continued when the box surrounding Peter Cooper square was painted early morning on December 12.

A student organizer involved in the action said, "During a time where some may be focusing on the pending lawsuit as our last hope to save the school, the students felt that it was important to reignite conversation outside of the courtroom."

This past weekend was Peter Cooper's birthday, and to the shock of many students the administration did not hold the annual wreath laying ceremony. As a reaction to administrative negligence, Free Cooper took it upon themselves to have a party complete with hot chocolate and cake. The night also allowed for students to converse with the Cooper Union Alumni Association, who were also celebrating Peter Cooper's birthday. During the course of the night, mysterious political messages appeared on the painted red box.

COOPER UNION HOLDS 6TH ANNUAL TALENT SHOW

BRENDA SO (CE '18)

The talent show started at 7pm this past Saturday, but the rehearsals started hours before, around 2pm. All the performance groups were grasping their opportunities to have one final rehearsal on stage, to give final touches and perfect their performance. The Cooper Union Talent Show, which consisted of 16 performances in 3 hours, provided a platform for students, as individuals or as clubs, to showcase their talents.

The MCs of the evening, Sam Zhang (EE '16) and Gavin Kaplan (EE '16), engaged the audience with their improvisation and humor. A variety of performances, including instrumental music, vocals and dances were displayed that night. "It just got to show that Cooper Union Student Performance are some of the best performers in the world," said Arnold Wey (EE '18). Wey, who performed in both Coopernova and a breakdance showcase, said "Peter Morfe's (EE '16) vocal solo made my legs numb."

The performance comprised individual and small group performances. Zach Chang (CE '16), who played the guitar in " Senbonzakura" in a kimono, amusedly recalled that "everything was wrong that night. My guitar didn't work, the keyboard didn't work, there was something wrong with the cables, so at the end we did not try to do it right and just have fun." The Ravel Chamber Ensemble, for instance, was an all-senior group who played the harp, flute, clarinet and string quartet. "I am extremely grateful to have the opportunity to perform with my classmates. We have been planning since sophomore year and rehearsing all of last semester," explained Sophie Lee Lamdau (ChE '15), who played the harp in the ensemble.

Multiple school clubs also performed. Coopernova performed a hip hop routine of "The Show Goes On" by Lupe Fiasco, a routine that they were going to perform in the US Championships later this month. The breakdance team broke down to amazing freezes and headstands that awed the audience. Johnny Chen (ME '17) said that "During the performance, I felt like I had talent. That's why it's called the talent show. I did the talent show last year for breakdance, but this year I did it with Coopernova as well. It was really fun and confortable to do things with people I knew. I am usually shy going on stage so there was some stage fright but knowing that I am on stage with my dancing family makes everything a lot better. Its sad there are only two more years for me in Cooper." And at the end, Coopertones performed an A cappella medley on "Zedd Medley," "Pompeii" and "On Top of the World."

Photo Credit: Winter Leng (ChE '18)

Photo Credit: Howard Chen (EE '16)

STARING CONTEST CLUB

EVAN BURGESS (Arch '15)

Before entering into a staring contest with Isabelle Page (Art '18), you must first come to terms with the fact that she has long ago forgotten how to blink.

You have ten minutes. Which ten minutes? Let us say, for the argument's sake, that they are the minutes between 9:30 and 9:40 on a Thursday night. What would Putin be doing during those minutes? What is love? How did these engineers get into the Foundation Building? That's right. During these particular minutes, you are staring into Isabelle's unblinking eyes.

Photo Credit: Winter Leng (ChE '18)

Let's take a step back. Why all the staring? You listen closely to the sound of a distant phonograph. All of your troubles are washing away. Over the sound of the record, you can make out Isabelle's voice: "It's important to look at each other ... [her voice is drowned out by static for few seconds] ... I wanted to create a format where people can start to get to know each other." This is why she started the star-

ing contest club.

The needle skips to the next track, and a new voice is barely audible over the static - is it Waseem? "A lot of clubs are isolated to their particular schools [radio static] this club is something that bring the schools closer together." The sound of the phonograph dies down, and you see an engineer staring at an artist. An architect is staring at both of them. Isabelle is staring at Anton. Still. According to your phone, it is only 9:36. All is at peace in the world.

Remember: If you win, feel privately superior. If you lose, feel publicly okay. Staring Contest Club is a way to practice competitiveness, without stress or judgment.

So go find someone whose face you would like to stare at. Invite them to Staring Contest Club. And stare at their face. Because this is probably your best excuse to do that.

CRYPTOVIROLOGY?!

PRANAV JONEJA (ME '18)

On Thursday, February 5th, Bloomberg hosted a talk regarding a somewhat obscure topic, cryptovirology, a field of research focused around the application of modern cryptographic paradigms and tools towards the creation of powerful malicious software. The speaker,, Adam Lucas Young, Ph.D, introduced by Christopher Hong (EE '13) and his coworkers from Bloomberg, touched on a wide variety of topics, from the birth of the field to the new developments being discovered due to the current efforts of many computer scientists.

One of the pioneers of the field, Young coined the term cryptovirology as he worked with his graduate advisor, Moti M. Yung of Columbia University. This research, which had started before the concept of cryptovirology was conceived, captured the interest of Young and Yung at a time when computer viruses were merely a myth. Experienced in electrical engineering and computer science, Young realized that the two fields he studied could merged through hacking. By 1995, he had subconsciously formulated a number of scientific problems that hackers themselves faced when infiltrating computer systems.

He described two attacks in particular—cryptoviral extortion, or ransomware in modern terms, and the Deniable Password Snatching

Attack, which prevents network defenders seeking to thwart attacks from incriminating the attacker when the attacks occur.

In the former attack method, a virus, worm or Trojan hybrid encrypts the victim's files. The victim must then pay the attacker in order to obtain the session key. This session key is encrypted under the malware creator's public key within the malware.

The latter method is an attack that can be mounted by a cryptotrojan that allows the attacker to garner information from the victim's system in a way that, even if the attacker is under surveillance on the local machine at the time of attack and when obtaining the information, he cannot be incriminated due to plausible deniability. This algorithm is derived through a combination of public key cryptography, probabilistic encryption, and the use of public information channels, together forming a secure receiver-anonymous channel. This gives the attacker sole authority to decode and control while the victim cannot have access. Young also discussed the use of hybrid encryption, combining symmetric and asymmetric as well as public and private keys, to increase the effectiveness of these attacks.

To read more about his work, visit www.cryptovirology.com.

SUMMER EXPERIENCES: YUTA MAKITA (ChE '15)

SAIMON SHARIF (ChE '15)

The Cooper Pioneer interviewed current students from the art, architecture, and engineering schools about their summer experiences. The interviews will be published as a series. We hope they will serve to highlight the diverse achievements of our student body.

Here is our interview with Yuta Makita (ChE '15).

The Cooper Pioneer: Where did you work?
Yuta Makita: For this past summer, I worked at Infineum USA in Linden, New Jersey.

TCP: What was your daily routine?
YM: There was no 'set' daily routine for me; the day to day work differed significantly depending on availability of laboratory equipment and what my supervisor wanted. Most days I worked in the lab for a good portion of the morning and then transferred the data on to my computer in the afternoon. Some days though, I would be doing lab work all day and some days I would be doing desk work for the whole day.

TCP: What was the best part about your internship?
YM: The best part of the internship was doing real time projects that relate directly to product manufacturing at Infineum. Everything I did had an impact on a process at a plant that is on the opposite side of the globe. In

addition, I was able to learn about the industry and improve my laboratory skills. I also made valuable connections with my former colleagues at Infineum.

TCP: How was it different from what you've done thus far?
YM: Industrial scale research is definitely different from research conducted in academia. The sensitivity of the information regarding research and products is taken very seriously at Infineum, and all projects need to go through a cost analysis to determine if the research is profitable for the company, which is a completely different approach than that in academia. In addition, I had the opportunity to gain experience with viscous products, which does not happen often in school laboratory classes.

TCP: What do you feel was the biggest takeaway from the experience?
YM: The biggest takeaway from my experience was learning about the petroleum additive industry as well as being aware of how research projects are conducted on the industrial scale. From my position and my team, I was able to learn about how processes developed in the technology department are scaled up to a plant size production as well as how my team solves issues that arise in the plant.

MENSCHEL EXHIBIT

WINTER LENG (ChE '18)

SNOW DAY!

Photo Credit: Winter Leng (ChE '18)

JAKE POTTER (ME '16)

Peter Cooper IN THE FUTURE — EPISODE TWENTY TWO — SUNDAY SIZED TRIPLE ISSUE

HACKS

JOSEPH COLONEL (EE '15)

Though Cooper staff was on holiday from this past Thursday to Monday, the NAB opened to host the Cooper Union's second annual hackathon. HackCooper, a Major League Hacking (MLH) sanctioned event, brought together corporate sponsors that donated hardware and software packages to the more than 150 student participants. The students, who ranged from high school to graduate students, had 24 hours to create their "hack" and present it to a panel of judges for a chance to win prizes.

MLH strives to "spread the hacker ethos to every student on the planet; to cultivate communities where aspiring hackers have the opportunity to learn, build, and share their creations with the world." As such, hackathons are hosted around the country, enticing students to take a project from concept to final product with free food, energy drinks, and "swag."

HackCooper was sponsored by IBM®, yodle®, Dow Jones, The Hackerati, LinkedIn, Rhine API, littleBits™, Make School, Burak Kanber, Hack Manhattan, Thalmic Labs™, Device Factory, MakerBot®, and MLH. "Hackers" could rent out hardware ranging from an Oculus Rift, Arduino, and Raspberry Pi to a menagerie of littleBits™ modules as well as use software packages and services from IBM and Rhine API. All devices had to be returned after the winners were announced.

All "hacking" had to stop by noon on Sunday for projects to be considered for prizes. Each team presented their "hack" in the Rose Auditorium to a panel of judges and semi-lucid students. A group of sophomores in high school won first place with their "Hopulus Rift," a frogger game built from the ground up that placed a hopping player in the titular frog's place by incorporating an Oculus Rift and Xbox Kinekt. Second prize went to "Tunetap | Touring," a website that promised to overthrow the current paradigm governing music gig booking. Third went to "Palmitron," a prosthetic hand controlled by a wearable device. Nobody from Cooper cracked the top three.

Prizes were also awarded for humorous design (Gif Me), technical prowess (String2String), and extraordinary design (littlePinball). Corporations, too, handed out awards. IBM® gave an award for best use of their Bluemix platform (readmedot-text); littleBits™ gave an award for best use of their hardware (littlePinball); Make School gave an award for best mobile hack (Myout). A full list of "hacks" may be found at https://www.hackerleague.org/hackathons/hackcooper-2015/hacks

My hack, "DreadBot," won no prizes.

HOW SHAKESPEARE WORKS

PRANAV JONEJA (ME '18)

Prof. Germano, Dean of the Faculty of Humanities and Social Sciences, has embarked on a new project: delivering a series of free lectures on the works of Shakespeare. "These talks are designed as an introduction – or reintroduction – to Shakespeare the poet-playwright-player and to the world of his plays." Over the course of nine one-hour lectures, Dean Germano will deconstruct the themes, characters and context of Shakespeare's less known works.

In an interview with *The Pioneer*, Dean Germano emphasized the relevance of Shakespearean literature to students of The Cooper Union, noting that "they [students] were first introduced to Shakespeare in early high school. Now that they are older, they can begin to appreciate the full extent to which Shakespeare addresses themes for more mature audiences". Outside his most famous plays, like *Romeo and Juliet* and *A Midsummer Night's Dream,* he explores mature themes like power, revenge, gender and sex. It is for this reason that Dean Germano selected plays like *Titus Andronicus* and *The Winter's Tale* for further analysis in his lecture series.

Delivered in The Great Hall every Monday evening at 6 o'clock, Dean Germano's lectures don't require a long time commitment and are both enlightening and entertaining. In fact, a portion of his first lecture was entirely in iambic pentameter!

For more information: http://bit.ly/HowShakespeareWorks

SUMMER EXPERIENCES: NATALIA MALIGA (Art '15)

CHAE JEONG (ChE '16)

The Cooper Pioneer interviewed current students from the art, architecture, and engineering schools about their summer experiences. The interviews will be published as a series. We hope they will serve to highlight the diverse achievements of our student body.

Here is our interview with Natalia Maliga (Art '15).

The Cooper Pioneer: Where did you work?
Natalia Maliga: I went to Ghana with Professor Toby Cumberbatch and five other students.

TCP: What was your daily routine?
NM: We didn't particularly have a daily routine, just worked every day on SociaLite and RAMESSES, depending which project had more priority that particular day—whether we were talking to people in Ghana or heading up to Burkina Faso to the refugee camp.

TCP: What was the best part about your internship?
NM: The best part was getting to know the people who lived in Kumasi and Jirapa, Ghana, where we spent most of our stay with Toby.

TCP: How was it different from what you've done thus far?
NM: I've never been to Africa before, and I've never really had the opportunity until this summer to work on projects with the engineers.

TCP: What do you feel was the biggest takeaway from the experience?
NM: That a new door has been opened for me—until now I haven't truly realized how much I really want to go travel to places in the world that no one would expect me to go to.