

# IN THE LOOP

A publication for College of Computing and Digital Media alumni

DEPAUL  
UNIVERSITY

COLLEGE OF COMPUTING  
AND DIGITAL MEDIA



Head lab moderator Jennifer Lawhead and student Chris Ferro work on a woodcutting machine in the Idea Realization Lab. Learn more about this makerspace on page 2.

Spring 2018

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# MAKER MOVEMENT MAGIC

Makerspaces encourage creative thinking and building

When you hold an iPhone in your hand or pick out a bookshelf at IKEA, you're probably not thinking about how those objects were made. But this imaginative leap is exactly the kind of creative thinking endorsed by the maker movement. More than that, the maker movement combines thinking with actual doing.

"In order to understand the things around you, you can't just be a passive learner," says Instructor Jay Margalus. "When you work in a makerspace, you become a hands-on practitioner. These are places that encourage thinking through making."

At CDM, this mindset is alive and well. A new makerspace, as well as a recent partnership with Caterpillar, showcase the college's dedication to this dynamic form of learning.

## IDEA REALIZATION LAB

It's a Friday night, and the Idea Realization Lab (IRL) is hopping. Located on the third floor of the Richard M. and Maggie C. Daley Building on the Loop Campus, the IRL is DePaul's 4,500-square-foot makerspace. Two months after the IRL opened in September, more than 1,000 people had already passed through its doors. A typical Friday evening draws a crowd of 60-70 students who converge on the space to tinker, hack and build using laser cutters, 3-D printers, sewing machines, button makers, vinyl cutters, power tools, CNC routers and more.

"Students, especially, feel like they have agency over this space," Margalus, the IRL's director, notes. "The equipment might be intimidating at first, but the space itself isn't." Lounge areas with reconfigurable furniture—some of which students built in the IRL—encourage visitors to hang out. Faculty members host office hours in the space, while student clubs hold weekly meetings. Student-led workshops are also a popular offering.

Theresa Boyle, a student in the MS in human-computer interaction program and the IRL's graduate assistant,

teaches the vinyl cutter workshop. Her expertise in that area led to a project with DePaul's Facility Operations, who asked her to make vinyl decals for glass walls in a nearby conference room.

"I've become better at problem solving since I started working here," Boyle says. "It's not only about persevering but also about understanding what went wrong the last time and how you can apply that knowledge to succeed in the future."

The creative possibilities inspired by the space are practically limitless. A group of students built a table for the office of DePaul President A. Gabriel Esteban, PhD, while the women's rugby team screenprinted their own jerseys. In October, several students came together for a project with Magic Wheelchair, a nonprofit organization that provides Halloween costumes for youth who use wheelchairs. The team soldered and sawed a gold Mario Kart car for a 13-year-old boy with muscular dystrophy.

"Anyone can throw a 3-D printer in a room and call it a makerspace, but not everyone can focus on the community like we do," Margalus says. "We tell the students, 'We trust you, you can do this,' and then they take it from there."



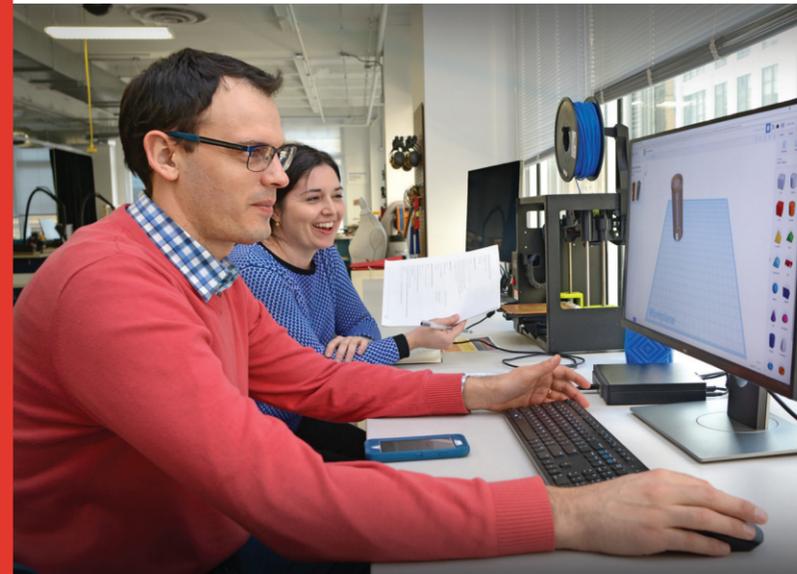
Sanjna Malik guides Sydney Saari during a 3-D printing project.

Photo by Tom Evans



Jennifer Lawhead dries the fresh paint on the IRL silkscreen t-shirts at the new makerspace in the Daley Building.

DePaul University/Jeff Carrion



Professor Chelsea Cossu observes Nicolas Cordoba as he works on a 3-D project.

Photo by Tom Evans

A group-centered approach is always emphasized in Margalus' courses. "Different people can complement and augment your ideas, ultimately making them better," he says. For the Caterpillar course, he divided the class into three groups to work on final projects focused on enhancing certain aspects of the company's production, design or maintenance processes.

"The cross-functional group project was a plus because it brought people from various backgrounds together," Ammu says. "It helped drive collaboration and communication."

Photo by Nicole Plaag



Caterpillar executives consider the implications of the IRL projects.

## THINKING THROUGH MAKING

This past summer, Margalus taught a certificate course to Caterpillar employees at their facility in Mossville, Ill. "Thinking Through Making" was offered through CDM's Institute for Professional Development, which provides opportunities for working professionals to enhance their skills in a short time frame. Fourteen Caterpillar employees matriculated as non-degree-seeking students; each achieved a Certificate of Professional Achievement upon completion of the course.

Annaji Ammu, a manufacturing project engineer, signed up for the course because he was interested in learning more about digital manufacturing and makerspaces in general. Before the course, he hadn't spent much time in the Caterpillar Innovation Accelerator Maker Space, but now he feels comfortable using the tools housed there. "I learned new skills that are directly impacting the way we manufacture products," he says. "I also learned to think innovatively."

Once the projects were completed, the students proudly shared their work with a group of Caterpillar executives from around the world. "They were super impressed," Margalus asserts. He remembers one executive saying, "This would save us hundreds of thousands of dollars if we implemented it at my plant."

Margalus is confident that the course will continue to benefit the students, even if their exact projects aren't replicated throughout the company. "It's not just about the machines," he says. "It's also about processes, ways of thinking and creativity."

Ammu concurs, noting that the hands-on curriculum was his favorite part of the course. "We had opportunities to apply the concepts we learned," he says. "It was a great program, and I'm glad I went through it."

# THINKING OUTSIDE THE BOX

School of Design exhibit explores the intersection of art and games



Photo credit: Peyote Creative

Music and ambient sounds from the shops and restaurants on the third floor of the Loop's Block Thirty-Seven mall filter into the glass-fronted Chicago Design Museum, but most of the visitors to the museum haven't noticed. They're exploring a world of sights and sounds wearing headphones or virtual reality goggles, traversing a 40-foot-long video game using a wireless controller or trying out the other games that constitute "Hey! Play! Games in Modern Culture."

"Hey! Play!," which ran at the museum Oct. 20, 2017, through March 10, 2018, was the brainchild of its co-curators, Associate Professor Brian Schrank and LeAnne Wagner, partner at Adjust Creative and a professional lecturer at DePaul. Wagner focuses on experience design in many of her classes, and Schrank not only chairs the undergraduate and graduate game design programs at CDM, but also has explored games as a creative research focus for more than a decade. The pair assembled an intriguing complement of games from all over the world to allow visitors to engage with a variety of experiences and make the connection between games and design.

"There is so much happening in the world of games," says Schrank. "Independent artists are making games about challenges they face in their lives, games that facilitate spiritual awakening, games that challenge and edify us into better versions of ourselves, games critical of dire political events and so on. 'Hey! Play!' shows how the medium of games extends through a number of continuums: digital to analog, introspective to social, curated to collaborative, sedentary to sweaty, serious to silly."

Feng Mengbo's "Long March: Restart" offers players a chance to connect with historic and contemporary cultural events. The game, which was inspired by the 1934 retreat

of the Chinese Communist Party's Red Army from troops of the Chinese Nationalist Party, allows players to maneuver an avatar up and down a 40-foot-long game corridor while trying to avoid being hit by cans of Coca-Cola. The game links China's communist past with its now-burgeoning capitalist economy.

"TempleOS," by artist Terry A. Davis, is a game filtered through the perspective of a sociocultural outsider. The Bible-oriented, 64-bit, open-source operating system invites players to engage with Bible verses and play games installed on the system. A computer placed in a curtained booth, complete with a kneeler, offered players an atmosphere inspired by the religious nature of the game.

Wagner used the exhibit to demonstrate to her students design intention and perceived versus actual user experience. "Giving students the ability to compare the different play styles and study designing for a public space have been excellent themes for discussion," Wagner says.

Of course, not every game requires players to be technologically savvy. "The Parachute Game" involves nothing more than finding ways to manipulate a parachute spread out on the floor. "I really enjoyed watching and playing 'The Parachute Game,'" says Wagner. "It's a nostalgic game that reminds people of their childhood, but also challenges the behavioral norms of a museum space. The game not only asks people to touch the exhibited piece, but to play with it and create their own experiences."

Wagner and Schrank both hoped that students and museum visitors would come away from "Hey! Play!" with a greater understanding of games. "We didn't expect everyone to like every game," says Wagner, "but we did hope that they would learn or feel something new from each of them."



Photo credit: U.S. Cyber Challenge

Former Federal Chief Information Officer Tony Scott (far left) and Steve Pappageorge (far right) of Moraine Valley Community College present awards to the winners of the USCC competition: Marco Alonzo, Emilio Herrera, Daniel Limanowski and Shannon Linares.

## TEAMWORK WINS THE DAY

CDM student showcases cybersecurity skills at national competition

Shannon Linares, who is majoring in cybersecurity, credits her team's victory this past summer at the Illinois Capture The Flag (CTF) competition of U.S. Cyber Challenge (USCC) to the team's willingness to work together and play to their strengths. This collaboration was no small feat: Linares and her teammates—Marco Alonzo (CDM '12), a network security engineer for Farmers Insurance, Emilio Herrera from Moraine Valley Community College in Palos Hills, Ill., and Daniel Limanowski from Iowa State University—had never met before they were randomly assigned to compete together.

The USCC competition, supported by the Department of Homeland Security Science and Technology Directorate through a contract with the nonprofit Center for Internet Security, is part of a strategy to answer the pressing need for cybersecurity professionals. It is open to any U.S. citizen 18 years of age or older, but only a select few are invited to attend the USCC's intensive four-day boot camp and participate in the competition on the fifth and final day.

In February 2017, adjunct faculty member Rami Salahieh offered his students extra credit to participate in the online Cyber Quests to qualify for the competition. "I did it as a group exercise so students could practice and enhance their experience in cybersecurity," Salahieh says. The quests were varied, but included CTF challenges that required participants to locate concealed "flags," unique strings of code hidden within the coding of the server itself.

The 2017 competition attracted more than 1,000 applicants from all over the country, who were invited to attend one of three camps. With Linares as their team captain, they started to prepare during weekly meetings over the summer.

"[Salahieh] would meet with us to give us a landscape view of 'Okay, maybe this is what you might expect during the challenge. This is how you could prepare for it. Do you have

any questions about this topic?'" Linares says. "Making himself available to help us outside of the classroom was a really big part of [our success]."

At the competition, which took place at Moraine Valley Community College July 31–Aug. 4, students were randomly matched to tackle the multipart challenge. "There was programming in different languages such as PHP, Python, SQL, and a bunch of different challenges involving log analysis and network security concepts," Linares recalls. None of the students she worked with over the summer were on any of her teams, which changed regularly in the days leading up to the competition itself.

**"OUR ABILITY TO COLLABORATE WITH ONE ANOTHER AND BE HUMBLE AND OPEN TO THE FACT THAT WE DIDN'T KNOW EVERYTHING MADE A REALLY HUGE DIFFERENCE."**

The final matchup to determine the winners of the challenge came on the last day, with five teams chosen on the basis of their scores during the week. "I ended up participating with a bunch of other students from different schools, so a lot of the competition had to do with not only being able to be a team player and have some sort of strength the team could benefit from, but also being able to lead," Linares says. "Our ability to collaborate with one another and be humble and open to the fact that we didn't know everything made a really huge difference."

Linares is grateful for the opportunity the USCC gave her to explore her career track and affirm how her skills can make a difference. "It's rewarding to see how I can help my community and people who are really vulnerable to these sorts of attacks."

# A Model Approach to Testing Water Quality

Data scientists team with DePaul students to improve water quality prediction and reporting



Nothing is more inviting on a hot summer day than taking a dip in a nearby pool or swimming hole. Chicago is fortunate to have the vast waters of Lake Michigan and its miles of beaches for relaxing, playing and beating the heat. Unfortunately, *E. coli*, a naturally occurring pathogen, sometimes reaches high enough levels to pose a health risk to swimmers. To help prevent illness, the City of Chicago regularly monitors the water quality at its public beaches.

Monitoring, however, is not without its challenges. According to Tom Schenk, chief data officer in the city's Department of Innovation and Technology, "Traditional testing methods take 18+ hours to get results, and historically, *E. coli* fluctuates often enough that the delay is too long to provide accurate public notifications. Rapid testing is available, but prohibitively expensive."

In November 2015, Schenk attended Chi Hack Night, a weekly meetup where Chicagoans in the data, design and technology communities exchange ideas and work on problems. Callin Osborn (CSH MS '17), then working on his master's degree in applied statistics at DePaul, was at the meeting and recalls the question Schenk posed: Can we predict *E. coli* levels at each of the 20 beaches in Chicago based on environmental factors? "I cold-emailed the City of Chicago looking for an internship in data science," he says, "and Tom decided to put me onto this project."

## A HYBRID PREDICTIVE MODEL

Osborn teamed with two data scientists in Schenk's department, Nick Lucius (CDM MS '06, JD '06) and Gene Lynes, to develop a better predictive model. The team found that they could not use environmental factors to predict *E. coli* levels. Instead, they developed a hybrid method that combines rapid sample testing with predictive modeling.

Schenk says, "The model works under the assumption that a significant amount of variation in beach water quality can be explained at the regional level, rather than a beach-specific level. That assumption is supported in the scientific literature and in the data."

"To cut down on the expense of running [the rapid sample test] at all 20 beaches," Osborn explains, "our model works by taking measurements at five or six beaches and extrapolating the data to predict what the *E. coli* levels will be at the other beaches." The model uses clustering analysis to choose which beaches to test and a supervised machine learning algorithm to make predictions given the selected beaches' test results.

## COMMUNICATING THE DATA

The next challenge was to communicate the data to the public to help them make an informed decision about swimming that day. Osborn recruited Renel Chesak, a master's degree student in computational methods who was in his data visualization class, to work on the problem. Chesak taught herself to use Shiny to create a web app ([bit.ly/chesakapp](http://bit.ly/chesakapp)) with easy-to-understand interactive visualizations.

Each day during the 2017 swimming season, water samples were rapid-tested and posted to the city's public data portal around noon. Within five minutes after posting, the model automatically detected the test results, generated predictions and posted them to the public portal ([bit.ly/chicagobeaches](http://bit.ly/chicagobeaches)). The pilot model's accuracy rate was 12 percent, three times higher than the prior model's accuracy rate under similar conditions.

## FOUNDATION FOR THE FUTURE

The work done to create the hybrid model has been written up for submission to a peer-reviewed publication. Osborn and Chesak are excited to be listed as co-authors.

Osborn says, "The most important thing I learned was how a team of data scientists can work together to solve a big problem. Much thought and work goes into every step of the process. It's important to make big data projects like this easy for the public to understand, and this internship gave me the skills to do that."

"It was a fantastic learning experience," Chesak says. "This kind of work definitely connected with what I want to do—data for social good. I think that all of it will continue to be immensely useful in my career going forward as I create data visualization dashboards for decision makers."

# THE BIGGER PICTURE

Students benefit from assistant professor's hands-on film experience



Assistant Professor Alireza Khatami finds that the roles of educator and student are strategically blurred in his classroom. "I believe teaching is a collaboration between teacher and students," says Khatami. "I respect what [my students] already know and they respect my experience. We meet halfway and exchange ideas."

This partnership allows Khatami to build trust and credibility in his directing and cinema production classes. It also helps that he recently completed his first feature-length film, "Oblivion Verses."

"I try to let students learn from mistakes I've made," Khatami says. "Filmmaking is about taking risks—some work out and some don't. I'm constantly trying to connect real-life experience with why we are doing each assignment."

Khatami, who previously only made short films, spent much of 2016 teaching at DePaul and also working on postproduction for "Oblivion Verses." Along the way, he updated his syllabus accordingly. "Now in my teaching, I emphasize that you need to think constantly of the bigger picture and not just one frame," he notes. "You need to have endurance to direct a feature film, as it's a much longer process. I'm trying to prepare students for a marathon, not just a 100-meter race."

There's only one scene in the film that Khatami did not direct. "I had to ask my assistant to [step in] so I could Skype my job interview with DePaul," Khatami says with a smile.

The protagonist of "Oblivion Verses" is an elderly caretaker of a remote morgue who attempts to give an abandoned, unnamed woman a proper burial. A subplot involves a family of whales, which Khatami says gives the film a "magic realist" feel and a "lighthearted and humorous take on a very tragic story."

Khatami's childhood in Iran inspired him to pen the screenplay. "I grew up during the Iran-Iraq war, and there were soldiers who died and were never found," he recalls. His film similarly features people who disappear "without a trace."

Despite this bleak background, The Hollywood Reporter praised the Spanish-language film, saying Khatami "has a real talent for creating images of abandon peppered with surrealist touches ... he deftly captures the desolation of the caretaker's world."

"Oblivion Verses" had its world premiere in September at the Venice International Film Festival, where it won three awards, including best screenplay in the Horizons category for newcomers. The film also screened at the Chicago International Film Festival in October and was accepted into film festivals in Toronto, Canada; Copenhagen, Denmark; Mumbai, India; Busan, South Korea; and Sao Paulo, Brazil.

*Edited and adapted from an article by Lorene Yue for DePaul University.*

**"I'm constantly trying to connect real-life experience with why we are doing each assignment."**





### WOMEN AT WORK

In October, the PhD Student Council and Upsilon Pi Epsilon, the international honor society for the computing and information disciplines, hosted a Women in Technology Workshop for more than 100 attendees. Kimberly Brown, global head of marketing for GE Renewable Energy Digital at General Electric, gave a keynote address, and a roundtable discussion featured female professionals from Cavis, Cook County Government, Sprout Social and Grubhub.



### LAB LIFE

Assistant Professor Isuru Godage launched a new cyber-physical systems lab this fall. The goal of the lab is to bring together computer and engineering experts to tackle real-life societal challenges in health care, disaster response, space exploration and other areas. Outfitted with state-of-the-art measurement tools and instrumentation systems, the lab will also focus on next-generation surgical robotics.



DePaul University/Jeff Carrion

### MOVING ON UP

Congratulations to recently promoted and tenured faculty! Savvas Paritsis, Doris Rusch and Brian Schrank were all promoted to associate professor with tenure, while Amber Settle (pictured) was promoted to full professor.



### SLEEPLESS NIGHTS

The first-ever DemonHacks hackathon took place over a 36-hour period at the end of October. A total of 115 college students from across the country collaborated on inventive software and hardware hacks, with many participants hunkering down in CDM for the duration of the event. DemonHacks secured six sponsors and awarded more than \$4,000 in prizes.



### SCREEN TIME

CDM was well represented at the 2017 ChicagoMade Shorts at the Millennium Park Summer Film Series with films from Nolan Downs (CDM '16) ("Shmevolution"), Instructor James Choi ("Arte(es) Vida"), MFA student Jonathan Leach ("Go Big"), Gavin Wright (CDM '15) ("A Fresh Cut") and Professional Lecturer Brian Zahm ("Marquee"). Choi's film also screened at the Chicago International Film Festival, as did Assistant Professor Alireza Khatami's film "Oblivion Verses" (see page 7), "Conditioner" from Shane Beam (CDM '17) and "Solo" from MFA student Terrien Williams.

### GIRLS WHO CODE

CDM is partnering with the nationally recognized Girls Who Code to host four two-week summer programs called Girls Who Code Campus for middle and high school girls. Campus offers a research-based curriculum designed to prepare girls to consider careers in technology and expose them to role models and a network of Girls Who Code alumni. Alumni parents who use the promo code DEPAUL will receive \$200 off Campus registration. Learn more at [bit.ly/GWCDDePaul](http://bit.ly/GWCDDePaul).



## BRAVO! BRAVO!

- Adjunct faculty James Foster, who has taught at the college for more than 10 years, received the CDM Adjunct Faculty Teaching Award for the 2016-17 academic year.
- CDM was included in MovieMaker's 2017 list of the Best Film Schools in the U.S. and Canada.
- MFA student Will Schneider (CDM '14) won the 2017 BlueCat Screenplay Competition in the shorts category for "Ageusia."
- Seven faculty members were cited in Newcity Film's list of Chicago's 50 Screen Gems: adjunct faculty Angie Gaffney (CDM '13), Producer in Residence Steven A. Jones, adjunct faculty Anthony Kaufman, Professional Lecturer Dana Kupper, Assistant Professor Anuradha Rana, Professional Lecturer Wendy Roderweiss and Professional Lecturer Susanne Suffredin.
- Associate Professor Doris Rusch received the Audience Choice Award for her pitch of the virtual reality game Soteria VR at the Stanford Brainstorm Virtual and Augmented Reality Innovation Lab at Stanford University School of Medicine.
- Professor Amber Settle was named chair of the Special Interest Group on Computer Science Education, a national organization dedicated to providing a global forum for educators in computing.



### ALUMNI CONNECTIONS

In March, faculty and alumni came together at The Berghoff in Chicago for a CDM Alumni Reception. Dean David Miller shared updates on the college, and guests enjoyed a pleasant evening of reminiscing and networking over cocktails and hors d'oeuvres.

# Tech Trailblazer

Alumna leads engineering team at fashion-forward Trunk Club



From the first moment Candice Savino (CDM '03) discovered programming in a computer science class in high school, she was a self-described “girl on a mission.” Savino delighted in programming’s problem-solving challenges, whipping through course modules and experimenting on a ramshackle desktop computer at home. When it came time to apply for college, Savino researched top computer science programs in the Chicagoland area, which led her to DePaul.

“I definitely think that getting my undergraduate degree from DePaul set me up for success in my career,” Savino says. “The curriculum focused on fundamentals but also real-world experience.”

Hands-on assignments—such as diagramming the entire database structure for eBay for one class—served Savino well when she graduated. After holding several internships with IBM, she was thrilled to accept a position as a software engineer at their suburban Chicago office. “It was right after the dot-com bust, so the industry wasn’t as alluring as it is now,” Savino remembers. “My classmates and I were worried we wouldn’t find jobs despite loving what we were doing.”

Savino has remained grounded throughout her impressive career, which has also included positions at Encyclopaedia Britannica, WMS Gaming, Groupon and now Trunk Club. As vice president of engineering, Savino oversees a team of 55 dedicated to improving the efficiency and effectiveness of

the company’s internal and external web applications.

“I’m fascinated by how Trunk Club is disrupting the retail industry,” Savino says. The Trunk Club model pairs customers with individual stylists who create personalized collections of clothes. Customers receive trunks at their home, where they can try on each item, keep what they like and send back the rest. This process is simple in theory, but it raises a challenging question, as Savino notes: “How do you scale a personalized, human service?”

The answer requires striking a careful balance. “We’ve tried to figure out how many of our customers would prefer a more automated process versus how many want the ‘high-touch’ service,” Savino explains. In 2017, Savino and her team rolled out a number of tools to help the stylists provide better service to both types of customers. “Initially, stylists were doing a lot of manual tasks that could be automated,” Savino says. “We redesigned their internal tools to help manage their tasks more efficiently so they could spend time on the most high-value work.” For example, the engineering team gathers data from customers’ onboarding questions to narrow down their preferences in a way that’s more personalized and efficient for the stylists.

Other innovations have made it possible for customers to schedule their trunk delivery frequency online and for stylists to email their clients within an internal system, instead of switching over to an email provider. “There’s still a lot to do, but we’re on the right track,” Savino asserts. This drive isn’t surprising for someone named to Crain’s Chicago Business “Tech 50” list for 2017. “Trunk Club has been a different challenge and a great learning experience,” Savino says. “It’s an exciting ride for sure!”



Ivonne Garcia, a sophomore majoring in interactive and social media, is accustomed to being in programming courses full of men. But this past fall, she found herself in the gender majority at the Grace Hopper Celebration, a massive gathering of women in technology sponsored by AnitaB.org. “The conference helped me realize there are many other women trying to accomplish the same goals as me,” Garcia says. “I saw that I am not alone.”

More than 18,000 participants, including six undergraduates from CDM, attended workshops, career fairs, networking events and presentations during the three-day festival in Orlando, Fla. Associate Dean Theresa Steinbach, who accompanied the young women, notes that the college received 55 applications for six available slots. DePaul provided scholarship support to cover the registration fee, airfare, hotel accommodations, and transportation to and from the hotel.

“I would not have been able to attend the conference without the scholarship,” asserts Alicja Fisher, a junior majoring in computer science. “I am thankful to everyone who gave me the opportunity to meet with such inspiring women.” Fisher says the conference was motivating and helped her develop confidence. Another direct result? She was offered an internship with Mastercard.

The conference also impacted Fiona Baenziger’s future path. “I realized the major track I was on was not right for me,” she explains. “I took all the information I gathered from the conference and did additional research, and then I switched my major to data science.” Baenziger is “super psyched” about this change and feels newly empowered. “There is so much space in the technology field to grow outward to fit your specific interests,” she enthuses. “We really can do anything.”

Support talented and motivated students like Ivonne Garcia, Alicja Fisher and Fiona Baenziger by making a gift to one of the funds below.

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### Office of Alumni Relations

alumni.depaul.edu  
(800) 437-1898

### College of Computing and Digital Media

cdm.depaul.edu  
intheloop@cdm.depaul.edu

#### Editor

Kelsey Schagemann

#### Contributing Editor

Marilyn Ferdinand

#### Designer

Francis Paola Lea

### DePaul University

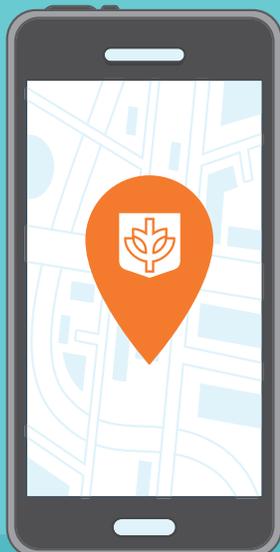
Office of Advancement  
1 E. Jackson Blvd.  
Chicago, IL 60604-2201

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