Anime-inspired graphics and a whimsical toy controller score points for a CDM game team. Learn more on page 8.
David Rein and Abum Okemgbo point to a computer screen displaying striated bands of white mottled with dark spots and interrupted by jagged peaks and valleys. “These are advanced stages of age-related macular degeneration, or AMD,” says Rein. He points to different areas of the optical coherence tomography (OCT) scans, showing magnified layers of a patient’s macula, the central area of the eye’s retina. “We’re focusing on drusen—small build-ups of waste. Analyzing this automated segmentation process with algorithms can show how drusen develop and, hopefully, help predict when people may get AMD.”

Rein and Okemgbo aren’t doctors or medical technicians. They’re undergraduate participants in MedIX, a highly selective, annual summer program at the School of Computing (SoC).

A unique medical informatics partnership opens students’ eyes to research-intensive graduate programs and careers

Supported by the National Science Foundation (NSF) through its nationwide Research Experiences for Undergraduates (REU) initiative, it accepts 10 students from across the country. Faculty and graduate mentors at DePaul and its program partner, the University of Chicago’s Radiology Imaging Research Institute, guide students through case studies in biomedical and health care informatics, a field that merges medicine with computer and data science to help medical practitioners make informed decisions more conclusively. The OCT scans are part of a large, aggregated data set provided by Northwestern Memorial Hospital.

“Prediction models are at the core of all these projects,” says SoC Professor Daniela Raicu, who founded the program 15 years ago with fellow SoC Professor Jacob Furst. “Machine-learning algorithms are key to making these predictions. You refine them to make sure they’re generalizable and robust for different patients.”

Other projects tackled by student teams reflect the vast variety of informatics research: Modeling uncertainty in medical reports. Predicting comatose patient outcomes. Mining data in Reddit mental health discussion threads to ascertain suicidal tendencies.

MedIX’s main goal, however, is to teach the rigors of interdisciplinary research many of the students will encounter in graduate programs in STEM fields.

“THAT'S at the top of the list,” says Furst. “They won’t all end up in medical informatics, so we also teach general aspects and phases of research.”

Six of the students are based at DePaul, four at the University of Chicago. They convene on Fridays to share progress reports, present papers and enjoy shared activities that provide insights into careers they’re considering. This past summer, for example, included a panel on women in science and technology, a field trip to Argonne National Laboratory and a visit from Harriet Taylor, a REU program director for NSF, which has provided more than $1.5 million in funding to MedIX, benefiting more than 130 students, 52 percent of whom are female.

Taylor was impressed by the student presentations she observed. “It takes a village to have a successful REU site, and we appreciate the commitment of your institutions to this program,” said Taylor. Sharing a comment from another NSF director unable to attend, she added, “I can confidently say the research you’ve done this summer, and hopefully will do in the future, will make this country healthier.”

It takes a village to have a successful REU site, and we appreciate the commitment of your institutions to this program.”

Ashley Sjurson analyzed CT scans to predict comatose patient outcomes.
Rewards that run deep

For the mentors, participating in the program has many rewards.

“I like to share my own passion for creative output,” says Wimp.

“It’s really wonderful to watch younger people. They are a lot more uninhibited in terms of their creative ideas. We developed two scripts as a group that they really connected to. One is a kind of slasher film called ‘The Reaper’ and another is ‘On the Swings,’ a character-driven drama about a young man who’s dealing with PTSD as he pursues some career goals.”

Michelle Lag, a senior majoring in game design, was amazed at how quickly the participants she was mentoring were able to produce a finished product. “They were just so knowledgeable, so culturally and politically aware in a way that I certainly wasn’t in high school. We did narrative, then art, then game design and 3D modeling, and they were able to take it all in and produce things that I was really proud of and amazed at.”

—MICHELLE LEGA

The experience of mentees is uniformly positive. “I loved the entire experience, to be honest,” says Omaha Whittaker, a young adult in the games section. “There was not one bad part about it to me. I grew over the course of six weeks, and not even just gaining a skill. I grew mentally. Knowing what I like and whatnot, and I met new people, made new friends. And I got paid to learn what I want to learn.”

Dynasty Robinson, who created graphic designs in Photoshop, chose the program because “I never knew about these things until I got here. So just being exposed, having that experience, meeting new people. And the food was good!”
Data science professors take a shine to luminous technology for online learning

John McDonald, an associate professor in CDM’s School of Computing (SoC), draws math equations in midair. They glow in the dark as he expounds on linear algebra in data analysis.

“We will transform and measure our data set in new ways by actually rotating it,” says McDonald. He makes a twisting gesture with one hand, and the symbols and numbers swirl in space. Then he clones himself: one McDonald lectures, the other calculates.

So what’s a lightboard?

A lightboard consists of two sheets of low-iron, architectural glass set inside a metal frame lined with an LED strip on its inner edge. Light from the LEDs is trapped and evenly distributed between the glass sheets. In a dark room, markings made on the illuminated board with a fluorescent, wet-erase marker appear to hover in space. Michael Peshkin, a Northwestern University mechanical engineering professor, devised the technology, which is ideal for instructional videos. DePaul’s studio was designed by School of Cinematic Arts (SCA) faculty who work at Cinespace, a professional film production facility that includes DePaul-operated stages. The lightboard studio was custom designed by SCA faculty who work at Cinespace.

Improving online courses

The lightboard videos add a high-production, competitive edge to SoC’s online graduate data-science program. In 2018, CDM Associate Deans Raffaella Sentimi-Woods and Theresa Steinbach and Associate Provost GianMario Besana secured a grant from DePaul’s Academic Growth and Innovation Fund to bolster the program’s assets and give CTL a unique teaching tool all DePaul colleges and departments can use for online courses and initiatives.

In the Loop

Creating the studio

In November 2018, the project team started testing production configurations in a large space at DePaul’s Daley Building. In January, they began building out a smaller space that fit their setup better: a former classroom on the lower level of the DePaul Center. By June, they were online and planning shoots.

John Corba, director of Cinespace, drew up specs for the lightboard and assembled it. Pete Biagi, SCA’s cinematographer in residence, assisted with the set design and placement of the digital cinema camera. Jeff Lyons, associate director of Cinespace, rigged the studio’s additional lighting. Part of the room was painted black, and a black curtain was hung as a triangular border around the shooting area. The camera peaks through one corner while the instructor, wearing a wireless lavalier microphone that records high-end audio, speaks and draws on the lightboard’s opposite side.

“This is where the wizardry happens,” says Kevin Lyon (LAS ’09, MA ‘11), a CTL senior instructional designer who oversees the studio. “In our productions, the background and glass completely disappear. It’s just the instructor and the text, which really pops off the glass.”

Postproduction editing is an essential part of the process. Shannon Lynott (CDM MBA ’19), the team’s videographer and editor, flips the image horizontally, since writing on the lightboard is backward from the camera’s point of view. The best takes from the shoot are selected and cut together. Equation writing is sped up; numerals are animated. Clones are produced. It’s also possible to superimpose PowerPoint graphics on areas of the lightboard through a color-swapping technique similar to a green-screen process. Videos will also be professionally captioned to aid English-language learners.

The bottom line

The bigger picture, says Lyon, is how the lightboard videos “affect student attainment, student success on the course, and use that as a model to roll it out for other courses.”

“Students are more engaged when they see an instructor looking directly at them while working through the different steps of an equation,” says Sentimi-Woods.
A 3D basketball game, Overtime, has taken the gaming world by storm. Created by DePaul students and alumni, the project began with a uniquely designed basketball toy. The toy, a fusion of traditional gameplay and modern technology, quickly captured the attention of industry professionals at the Game Developers Conference (GDC). The Overtime team, led by project lead Josh Delson (CDM ’17), showcased their innovative approach to game design.

The networking ramped up at GDC as thousands streamed by the Overtime booth. Every second counts.
CINEYOUTH SUCCESSES
SCA students achieved outstanding results at the 2019 CineYouth competitions sponsored by Cinema Chicago. Emily Gray and Grace Golembiewski were two of the four finalists in CineYouth’s Film Pitch, with Gray winning for her project “The Scholar.” Connor O’Keefe won CineYouth’s Chicago Award for his film “Our Transition,” and Don Josephus Raphael Elbaham won the Best Experimental award for “Umbilical Cord to Heaven.”

END-OF-YEAR STUDENT SHOWCASES
Undergraduate and graduate students showed off their work, including research, films and animations, games, user-experience and graphic design, last spring at the following events: GraphicDesign/BCMA (Digital Communication and Media Arts) Showcase, Schools of Computing/Design Research Symposium, Game Capstone, Premiere Film Festival and UXD (User Experience Design) Showcase.

BADGES OF HONOR
The Idea Realization Lab was commissioned last spring to create 1,700 custom badges for THOTCON, the Midwest’s largest hacking conference. The interactive badges, designed and coded by students in the maker space under the guidance of faculty members Jay Margalus and Rudy Retch, contained an alternative (screenless) interface with a circuit board that played a video game.

HEAVY METAL GUITAR
School of Design Assistant Professor Nathan Matteson and his design company, Obstructures, received a gold medal in product design at the International Design Awards for their new, all-aluminum bass guitar. The slender instrument, which features a removable fretboard, increases frequency range, sustains and reduces noise while also emphasizing player accessibility and durability.

DATA SCIENTIST HONORED
Assistant Professor Tanu Malik was awarded a Faculty Early Career Development grant, the National Science Foundation’s most prestigious award in support of early-career faculty. She will use the grant to design and develop a container method for sharing and reproducing computational artifacts. Malik plans to enlist DePaul students in the research, which will help scientists validate and build on each other’s work involving computations and data. She hopes to make the entire “compute environment”—data, programs, operating systems—portable so researchers can assess whether their experiments are reproducible, and others can do so more quickly and efficiently.

PROJECT BLUELIGHT SHINES ON
“On, baby,” a short film by Associate Professor Meghan Arts, won the silver award for animation at the University Film & Video Association conference following its unprecedented, collaborative creation by faculty and students from SCA and DePaul’s Theatre School and School of Music. Scored by SCA Associate Professor Rob Steel and inspired by fertility medicine, the film blends colorful Busby Berkeley-style choreography and Rube Goldberg-inspired stop-motion animation in an abstract celebration of conception.

“In Hihome,” a CG-animated short film in progress by Brian Andrews, SCA chair of postproduction, was selected for a pitch and demonstration at the XR Development Showcase, held last spring at the Cannes Film Festival. Set against a landscape of X-ray imagery and anatomical reimagination, the film follows a mother and her children’s struggle for survival.

Both films were supported by DePaul’s Project Bluelight production company, which pairs faculty and students on professional productions.

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Redar Ismail transforms adversity into award-winning software that aids others
The family fled to Syria, finding mutual support with other Kurdish refugees in Damascus, then briefly lived in The Netherlands before returning to their homeland. Ismail earned an undergraduate degree in software engineering and worked in IT at the regional government’s Ministry of Martyrs and Anfal Affairs, which aids genocide survivors. In 2012, he met representatives from DePaul who were visiting the region. Supported by a Kurdish government scholarship, Ismail moved to Chicago, where he earned an English language certificate and an MS in e-commerce at DePaul.

In 2014, midway to his master’s, he went home for family visit only to retreat quickly when ISIS launched a genocidal campaign in the region against the Yazidis, an indigenous ethnic Kurdish minority that practices a gnostic faith.

Ismail seems remarkably stoic in the wake of tragedy and discrimination, but says sleepless nights are common. He finds therapy in projects that help others.

In 2017, he created an augmented-reality, interior-design HoloLens app as part of the winning team at Chicago’s BuildWorlds Hackathon. This past spring he was part of DePaul’s winning team at the Greater Chicago Food Depository’s Hackathon to End Hunger, which proposed a system to provide disabled people better access to food distributors. He’s also helping Associate Dean Theresa Steinbach, his PhD supervisor, develop a STEM-oriented framework for teaching computer science to middle schools.

In addition to Steinbach, Ismail credits CDM technical staff Anthony Zoko, Kuo Lun Tye, Yiding Wang, Michael Washington and Richard Razo for teaching him software development skills. Zoko, an adjunct professor and software development manager, also sponsored Ismail’s CDM assistantship, which helps him cover tuition.

Ultimately, Ismail hopes to start a software engineering firm that employs students and immigrants, but he won’t speculate on the products they’ll design.

“Never obsess about today’s technology, because it will be obsolete before you know it,” Ismail says. “I do not like limitations. Everything can change.”

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Window Wonderland

Visit the Richard M. and Maggie C. Daley Building to see “Merry Christmas from DePaul,” a stop-motion-animated short film looping in a 3D window display at 247 S. State St. Created by the School of Cinematic Arts in collaboration with the Division of Mission and Ministry, its stars of wonder, paper ballerinas and gingerbread forests celebrate the magic of the season.