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MAGAZINE



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Comet Mettle

IN 2020, THE University of Texas at Dallas community faced and overcame unprecedented challenges created by the COVID-19 pandemic. In the opening weeks of 2021, yet another atypical event blew across campus. The University closed in mid-February when a freak winter storm brought below-zero temperatures and multiple inches of snow to the North Texas area, leaving many faculty, staff and students to deal with outages of power, water and internet on campus and in their homes. But computer science freshman Zane Leblanc showed his true Comet mettle by making a makeshift snowboard to enjoy the campus winter wonderland.

**Vice President,
Communications**
John Walls

Editorial Director
Heidi Harris Cannella

Executive Editor
Amanda Siegfried

Contributing Editors
Paul Bottoni
Marc Johnson

Creative Director
LeeDon Moore MFA'14

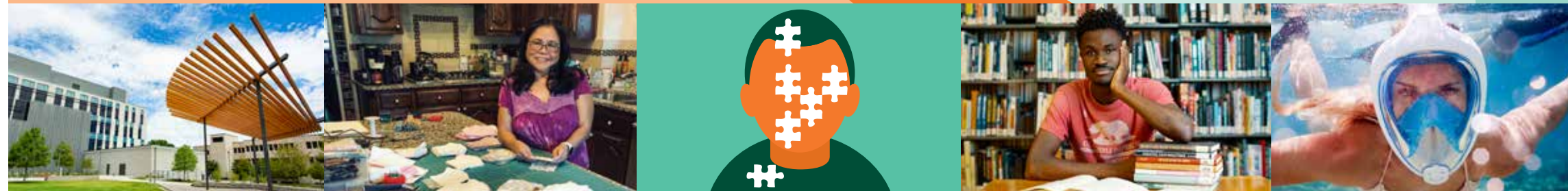
Contributing Writers
Stephen Fontenot
Melissa Graham
Kim Horner MA'05
LaKisha Ladson MA'18
Brittany Magelssen
Phil Roth MPA'21
Robin Russell
Daniel Steele

Designer and Illustrator
Steve Chambers

Photographers
Ricardo Castrillón BA'17
Rachael Drury BA'19
Nitashia Johnson
Sarah Wall BA'19

CONTACT US
UT Dallas Magazine
800 W. Campbell Road, AD14
Richardson, Texas 75080-3021
972-883-2155
utdallasmagazine@utdallas.edu

Subscribers
For address changes, contact:
data@utdallas.edu



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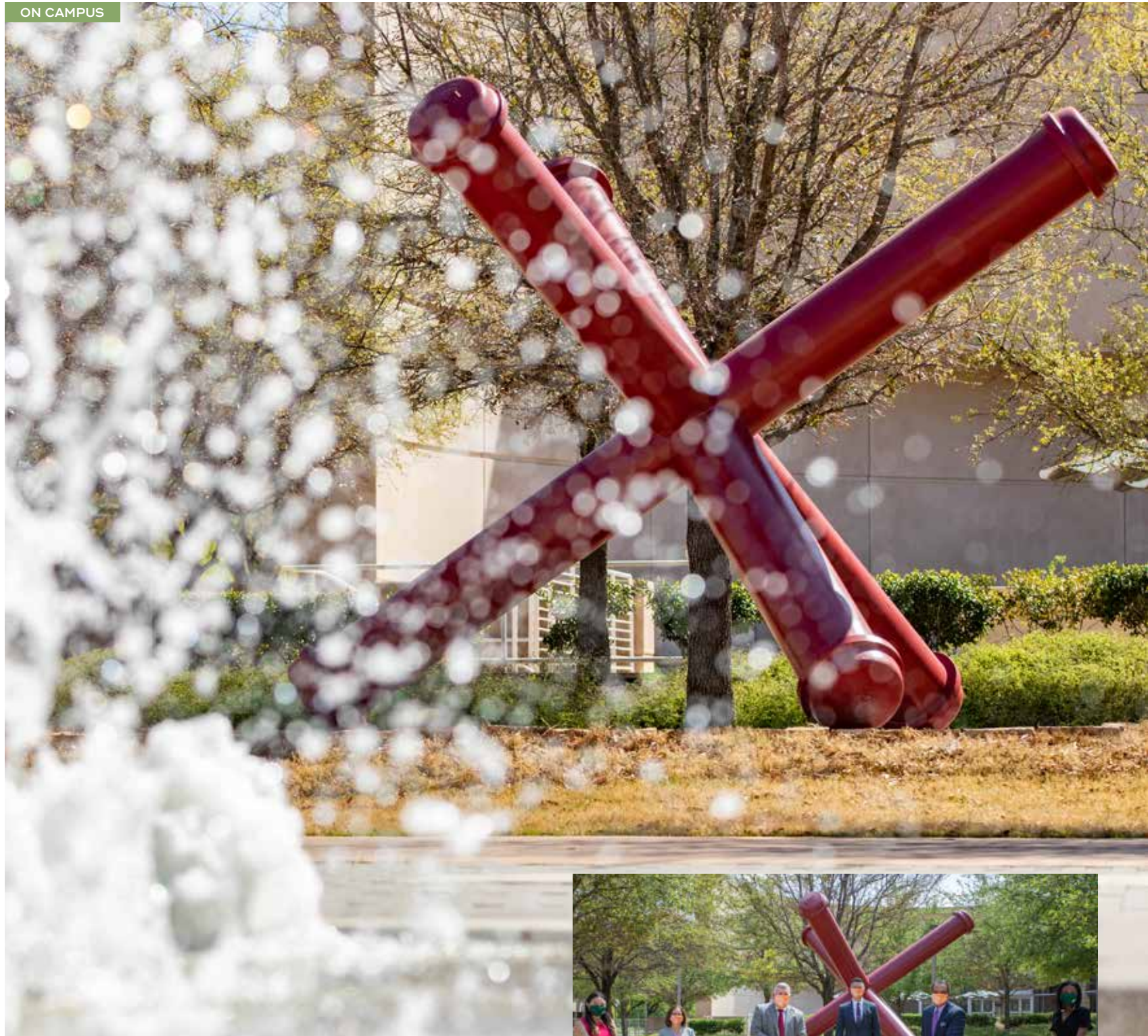


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ON CAMPUS



Love Jack Gets New Home

The Love Jack sculpture, which has had a few homes on the UT Dallas campus over the years, was recently moved from the courtyard at the Edith O'Donnell Arts and Technology Building to a spot on the Margaret McDermott Mall near Texas Instruments Plaza. Student Government advocated for its relocation so that more students could enjoy the view. Gifted to the University in 1976 by Margaret McDermott, longtime champion of UT Dallas and wife of co-founder Eugene McDermott, the 10-foot-by-10-foot red, steel sculpture of a playing jack was created by Texas artist Jim Love.



RESEARCH

Geoscientists Create Deeper Look at Processes Below Earth's Surface with 3D Images

GEOSCIENTISTS AT UT Dallas recently used supercomputers to analyze massive amounts of earthquake data to generate high-resolution, 3D images of the dynamic geological processes taking place below the Earth's surface.

In a study published April 29, 2020, in *Nature Communications*, the research team described how it created images of mantle flows in a subduction region under Central America and the Caribbean Sea using a computationally intensive technique called a full waveform inversion (FWI).

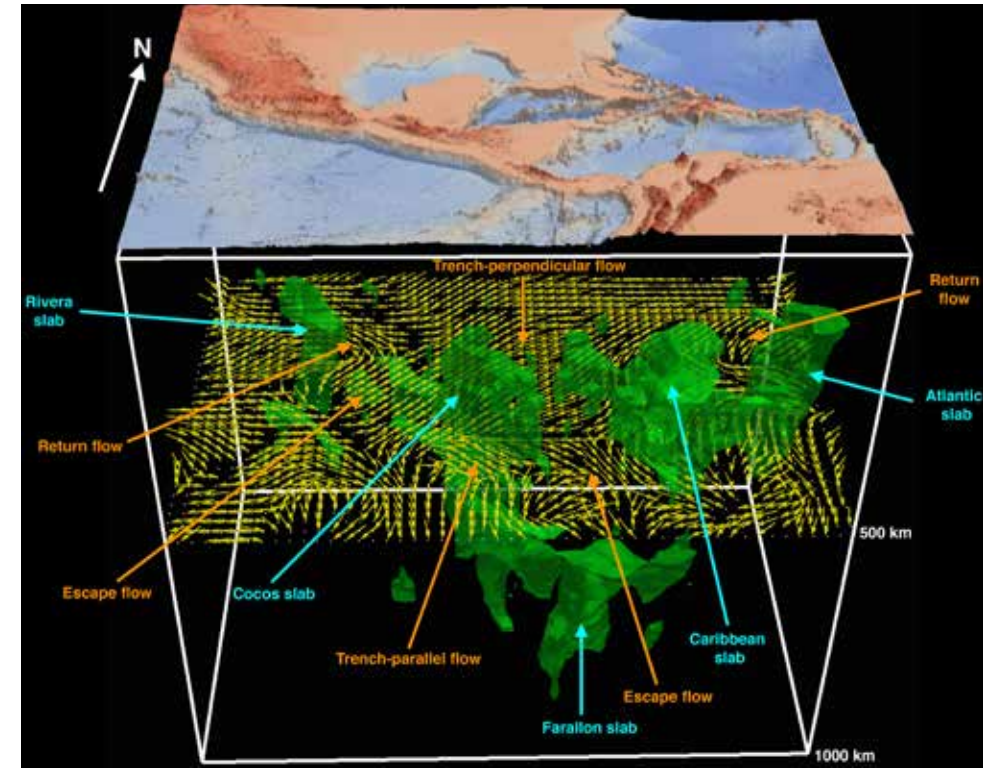


"This is the first comprehensive seismic study to directly image 3D mantle flow fields in actual subduction environments using advanced FWI technology," said **Dr. Hejun Zhu**, corresponding author of the study and assistant professor of geosciences in the School of Natural Sciences and Mathematics. Jidong Yang PhD'20 and Dr. Robert Stern, professor of geosciences, are the study's co-authors.

Between the thin layer of the Earth's crust and its inner core lies the mantle. Earth's crust is broken into pieces called tectonic plates. These plates move across and into the mantle very slowly. At regions called subduction zones, one plate descends under another into the mantle.

"The sinking of oceanic plates into the Earth's mantle at subduction zones is what causes the Earth's tectonic plates to move and is one of the most important processes taking place in our planet," Zhu said. "Subduction zones are also the source of many natural hazards, such as earthquakes, volcanoes and tsunamis. But the pattern of mantle flow and deformation around descending plates is still poorly understood."

Zhu and his colleagues tackled the problem using a geophysical



measurement called seismic anisotropy, which measures the difference in how fast mechanical waves generated by earthquakes travel in different directions inside the Earth.

"When a diver dives into water, the water separates, and that separation in turn affects the way the water moves around the swimmer," Zhu said. "It's similar with oceanic plates: When they dive into hot mantle, that action induces mantle separation and flow around the plates."

The research team created the images using high-fidelity data recorded over a 10-year period from 180 earthquakes by some 4,500 seismic stations located in a grid across the U.S.

"Previously we couldn't 'see' under the Earth's surface, but by using this technology and this very wonderful data set, we are able to delineate the 3D distribution of various seismic phenomena and tell at what depths they are occurring," Zhu said.

The images confirmed that the plates in the study region are not large, solid pieces but rather are fragmented into smaller slabs.

"This looks different from the textbook depictions of tectonic plates coming together, with one solid piece of oceanic plate descending under another solid piece," Zhu said. "Some researchers have hypothesized that this fragmentation occurs, and our imaging and modeling provide evidence that supports that view."

The research was funded by a grant to Zhu from the National Science Foundation's Division of Earth Sciences.

-Amanda Siegfried

ON CAMPUS

Alumna Named Executive Director of the Callier Center for Communication Disorders



ANGELA SHOUP BS'89, MS'92, PhD'94, who previously led the Division of Communicative and Vestibular Disorders at UT Southwestern Medical Center, has been selected as the new executive director of the Callier Center for Communication Disorders at UT Dallas.

After earning three degrees from UT Dallas, Shoup said, "It's definitely like coming home. I've had a commitment to UT Dallas Callier since the days when Callier and the University were much smaller." In 2016 she received the University's Distinguished Alumni Award.

At UT Southwestern, where Shoup was a professor of otolaryngology – head and neck surgery, she oversaw a team of 30 audiologists, five speech pathologists and two audiology externs who worked across multiple institutions, including UT Southwestern, Parkland Health & Hospital System and Children's Health.

Shoup is known for her promotion of universal newborn hearing screening with a focus on follow-up for infants who do not pass the

screening. She inaugurated such a program at Parkland in 1999 and traveled to Austin multiple times, where she advocated for implementation of screening and follow-up services for infants born in Texas hospitals.

The Callier Center works closely with UT Southwestern in providing children with cochlear implants. Shoup said she hopes to expand such collaborative activities in the future.

Shoup is president of the American Academy of Audiology, the world's largest professional organization of audiologists. She was

named a *D Magazine* Best Doctor in 2018 and 2019. She was inducted into the National Academies of Practice (NAP) Audiology Academy as a Distinguished Scholar and Fellow and currently serves as vice chair of the Audiology Academy for NAP.

-Phil Roth



RESEARCH

What Can Past Propaganda Tell Us About Today's Efforts?

UT DALLAS RESEARCHERS are investigating whether attempts by the U.S. government to gain support from Latin American citizens during World War II can be applied to modern propaganda efforts.

The project is developing novel computational models to analyze text and photos from *En Guardia*, a magazine created by the U.S. government to encourage support for the U.S. and its allies during the war.

"The underlying theoretical strategies that we're looking at are not unique to this particular time period or to this particular data set," said Dr. Monica Rankin, associate professor of history in the School of Arts and Humanities and director of the Center for U.S.-Latin America Initiatives. "We expect we will identify techniques that can be applied anywhere."



The project is funded by a \$100,000 seed grant from the Office of Research. Rankin is collaborating on the work with Dr. Vincent Ng, professor of computer science in the Erik Jonsson School of Engineering and Computer Science. Ng will perform natural language processing analysis on all aspects of *En Guardia* during its four years of existence (1941-45).

"We will be analyzing both images and text and then trying to understand how different propaganda techniques or devices are being realized in words or images," he said. "For instance, are there particular characteristics that would let us know that a certain propaganda

device is being used? Or what kind of messages are being conveyed in a given article that are being used for propaganda purposes?"

He said the goal is to use machine learning to identify characteristics of a particular propaganda device that is not overtly mentioned in the text or the photos.

En Guardia was created by the U.S. Office of the Coordinator of Inter-American Affairs, which was established in 1940 to counter Italian and German propaganda in Latin America. The magazine was popular and distributed free to politicians, journalists and business executives.

Rankin said the propaganda strategies employed in *En Guardia* are fairly universal and used today.

"We're constantly being barraged with information that is designed to convince us to feel or act a certain way, and a lot of that information is coming from not-so-friendly sources," she said. "Being able to have a computer help us identify when that's happening and how it's happening — and which strategies are potentially at play — can help us make decisions about how to respond."

-Phil Roth

FAST FACTS

UT Dallas Comet Cupboard

Operated by the Office of Undergraduate Education.

Launched in 2012, Comet Cupboard was the **first** university food bank established in Texas.

Relies on **volunteers, donors and donations.**

Free to all enrolled UT Dallas students.

In March 2020, at the beginning of the COVID-19 pandemic, volunteers delivered **emergency supply boxes** to students living on campus.



For more info, scan to visit oue.utdallas.edu/cupboard

Spring 2021 statistics:

- Served **twice** as many students per week as it did in fall 2020.
- Distributed more than **1,600** items per week.
- Received more than **1,000** donated items per week.
- **15%** of weekly visits were from first-time users.



IN MEMORIAM

Dr. Kenneth Altshuler: Longtime Callier Center Supporter

DR. KENNETH ALTSHULER, a longtime supporter of the UT Dallas Callier Center for Communication Disorders, died Jan. 6, 2021, at the age of 91. Early in his career, Altshuler developed a widely used mental health model for those with hearing loss and hearing impairment that impacted the field of psychiatry.

Altshuler was a board member of the Foundation for the Callier Center and Communication Disorders when he and his wife, Ruth, provided the inspiration and initial gift to start the Callier Care Fund, which is used to assist patients who experience financial barriers to accessing needed speech and hearing services. Ruth Collins Sharp Altshuler, who also was a Callier Center supporter, died in 2017.

"Because of the Altshulers' generosity, patients at Callier are able to access diagnostic and therapeutic services that can help them communicate with their family and friends and participate more fully in opportunities presented to them," said Angela Shoup BS'89, MS'92, PhD'94, the Ludwig A. Michael, MD, Callier Center Executive Director.

The center in 2012 began awarding the Ruth and Ken Altshuler Callier Care Award to individuals or groups who contribute significantly to the betterment of the community and to advancing the care of patients with communication disorders. The Altshulers were the first recipients of the award.

In 2018 a clinical wing inside the Callier Center Richardson Addition was named the Altshuler Wing, in honor of the couple who had contributed so much to the center.

Altshuler served on the UT Southwestern Medical Center faculty for 42 years — 23 of them as chairman of psychiatry.

-Phil Roth



RESEARCH

Study Outlines What Creates Racial Bias in Facial Recognition Technology

AS FACIAL RECOGNITION technology comes into wider use worldwide, more attention has fallen on the imbalance in the technology's performance across races.

In a study published online Sept. 29, 2020, in *IEEE Transactions on Biometrics, Behavior, and Identity Science*, researchers from UT Dallas' School of Behavioral and Brain Sciences (BBS) outlined the factors that contribute to these deficits in facial recognition accuracy and offered a guide to assess the algorithms as the technology improves.



Dr. Alice O'Toole, the Aage and Margareta Møller Professor in BBS, is the senior author of the study, which she describes as both "profound and unsatisfying" because it clarifies the scale of the challenge.

"Everybody's looking for a simple solution, but the fact that we outline these different ways that biases can happen — none of them being mutually exclusive — makes this a cautionary paper," she said.

In a study in 2019 conducted by the National Institute for Standards and Technology, the government agency found that the majority of facial recognition algorithms were far more likely to misidentify racial minorities than whites.

As a result of their research, the UT Dallas scientists concluded that while there isn't a one-size-fits-all solution for racial bias in facial recognition algorithms, there are specific approaches that can improve the technology's performance.

Jacqueline Cavazos PhD'20, the study's lead author and a former psychological sciences student, divided the factors contributing to bias into two categories: data-driven and operationally defined. The former influence the algorithm's performance itself, while the latter originate with the user.

"Data-driven factors center on the most commonly theorized issues — that the training pool of images is in itself skewed," Cavazos said. "Are the images being used representative of groups? Are the training images of the same quality across races?"

O'Toole added, "Our discussion of image

difficulty for racial bias is a relatively new topic. We show that as pairs of images become more difficult to distinguish — as quality is reduced — racial bias becomes more pronounced. That hasn't been shown before."

O'Toole believes their research could help users understand which algorithms should be expected to show bias and how potentially to calibrate for that bias. She said researchers are still fighting myths about facial recognition bias. One is the notion that bias is a problem unique to machines. Another is the perception that race is an all-or-nothing descriptor.

"Race must not be viewed as ... if there's a finite list of races," O'Toole said. "In truth, biologically, race is continuous, so it's an unreasonable expectation to think you can say 'race equity' and tune an algorithm for two races. This might disadvantage people of mixed race."

The research was supported by the National Eye Institute and the Intelligence Advanced Research Projects Activity, part of the Office of the Director of National Intelligence.

-Stephen Fontenot

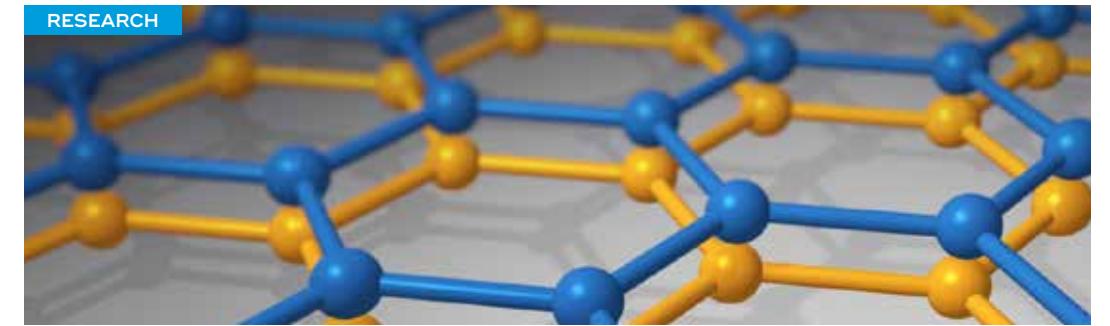
"We show that as pairs of images become more difficult to distinguish — as quality is reduced — racial bias becomes more pronounced."
-Dr. Alice O'Toole



Comet NEOWISE

The COVID-19 pandemic made 2020 a very challenging year, but over the summer there was at least one beautiful bright spot. Comet NEOWISE, short for C/2020 F3 (NEOWISE), was discovered in late March 2020 by astronomers using the Wide-field Infrared Survey Explorer (WISE) space telescope as part of NASA's NEOWISE mission. Comet NEOWISE provided a pleasant diversion as it was visible in North American skies throughout much of July. Dr. Joseph Izen, professor of physics at UT Dallas, photographed the comet in southeast Oklahoma.

RESEARCH



Physicists Find Misaligned Carbon Sheets Yield Unparalleled Properties

A MATERIAL COMPOSED of two one-atom-thick layers of carbon has grabbed the attention of physicists worldwide for its intriguing — and potentially exploitable — conductive properties.

Dr. Fan Zhang, assistant professor of physics in the School of Natural Sciences and Mathematics at UT Dallas, and physics alumnus Qiyue Wang PhD'21 published an article in June 2020 with Dr. Fengnian Xia's group at Yale University in *Nature Photonics* that describes how the ability of twisted bilayer graphene to conduct electrical current changes in response to mid-infrared light.

Graphene is a single layer of carbon atoms arranged in a flat honeycomb pattern, where each hexagon is formed by six carbon atoms at its vertices. Since graphene's first isolation in 2004, its unique properties have been studied by scientists for potential use in advanced computers, materials and devices.

If two sheets of graphene are stacked on top of one another, and one layer is rotated so that the layers are slightly out of alignment, the resulting physical configuration, called twisted bilayer graphene, yields electronic properties that differ significantly from those exhibited by a single layer alone or by two aligned layers.

When the graphene layers are misaligned, a new periodic design in the mesh emerges, called a moiré pattern. The moiré pattern is also a hexagon, but it can be made up of more than 10,000 carbon atoms.

"The angle at which the two layers of graphene are misaligned — the twist angle — is critically important to the material's electronic properties," Wang said. "The smaller the twist angle, the larger the moiré periodicity."

The unusual effects of specific twist angles on electron behavior were first proposed in 2011. Researchers later proved that offsetting two graphene layers by 1.1 degrees, the "magic angle," produced a two-dimensional superconductor and that, when offset by 0.93 degrees, twisted bilayer graphene exhibits both superconducting and insulating states.

"The fact that you can manipulate pure carbon to superconduct is amazing and unprecedented," Wang said.

In their most recent research, Zhang and his collaborators investigated whether and how twisted bilayer graphene interacts with mid-infrared light, which humans can't see but can detect as heat.

"Interactions between light and matter are useful in many devices — for example, converting sunlight into electrical power," Wang said.

Zhang and Wang set out to determine how mid-infrared light might affect the conductance of electrons in twisted bilayer graphene. Using resources of the Texas Advanced Computing Center, Wang calculated the band structure and showed how the material absorbs light.

Dr. Joe Qiu, program manager for solid-state electronics and electromagnetics at the U.S. Army Research Office (ARO) said, "This new breakthrough will potentially enable a new class of infrared detectors based on graphene with high sensitivity. These new detectors will potentially impact applications such as night vision, which is of critical importance for the U.S. Army."

The ARO, the National Science Foundation and the Office of Naval Research supported the study.

-Amanda Siegfried

ON CAMPUS

Geoscientist Named New Dean of Natural Sciences and Mathematics



DR. DAVID HYNDMAN, a geoscientist with 25 years of experience as a researcher, educator and academic administrator, has been named dean of the School of Natural Sciences and Mathematics and holder of the Francis S. and Maurine G. Johnson Distinguished University Chair. Hyndman was previously chair of the Department of Earth and Environmental Sciences at Michigan State University. He received his undergraduate degree in hydrology and water resources from the University of Arizona and his master's and doctoral degrees in hydrogeology from Stanford University.

Hyndman is an expert in hydrogeology, the study of groundwater and how water gets into the ground, how it moves under the surface and how it interacts with the surrounding soil and rock. His research focuses on developing methods to characterize the aquifers that store and transmit water supplies critical to human and ecological health, and quantifying how human activity, such as changes in climate and land use, impact the water cycle.

Funding for Hyndman's research has included grants from the National Science Foundation, NASA and the U.S. Department of Agriculture.

Hyndman worked part time as a hydrologist for the U.S. Geological Survey before joining Michigan State in 1995. During a decade as department chair, he successfully led the revitalization of the department by adding tenure-system faculty, growing research programs, enhancing curriculum and increasing alumni endowments.

In addition to more than 100 peer-reviewed journal articles, Hyndman has published a textbook, *Natural Hazards and Disasters*, now in its fifth edition, which he co-wrote with his father, Dr. Donald Hyndman. In 2006 he was elected a fellow of the Geological Society of America.

-Amanda Siegfried



ON CAMPUS

New Sciences Building Is Pure Gold

THE NEW 186,000-SQUARE-FOOT Sciences Building opened in July 2020 and soon after was awarded LEED Gold status by the U.S. Green Building Council.

It houses the Department of Physics, classrooms, offices, teaching and research labs, and some activities of the William B. Hanson Center for Space Sciences. The building features two lecture halls and an open courtyard with green space and seating areas.

The new building is an "absolutely gorgeous space," said Dr. Matthew Goeckner, interim head of physics and associate dean of the School of Natural Sciences and Mathematics (NSM). "It not only provides enough space for teaching labs, but it also enables the entire physics department to be under one roof rather than scattered in eight buildings across campus."

Dr. Bruce Novak, professor of chemistry, holder of the Francis S. and Maurine G. Johnson Chair and former dean of NSM, advocated for the new building. He said the L-shaped design allows students to see science in action as they pass teaching labs on the ground floor.

"We're thrilled with it. This building really enhances our ability to teach in a modern physics lab setting," Novak said. "I can't praise the architect firm Stantec and the construction firm Linbeck enough. It was just beautiful how it all came together."

Because the building's basement was built close to bedrock, it will enhance physics research for experiments that require minimal vibrations, "the lowest temperature you can conceive," or a dark environment for laser spectroscopy, Novak said.

As the world's premier credentialing system for sustainable construction, LEED, or Leadership in Energy and Environmental Design, recognizes environmentally conscious construction around the globe.

The Sciences Building incorporates regionally sourced materials and technology that significantly reduce water consumption. Energy-efficient equipment and lighting reduce energy use, and about 75% of demolition and construction waste was diverted from landfills through recycling. Nearly a quarter of the building materials were made of recycled content, including concrete, steel, framing, drywall and flooring.

"The Sciences Building is the eighth LEED-certified building at UT Dallas in the last decade and brings our LEED-certified square footage on campus to nearly 1.3 million. The University's commitment to sustainability in the midst of our tremendous physical growth has been a point of pride for our entire campus community," said Gary Cocke, UT Dallas director of energy conservation and sustainability.

-Robin Russell

RESEARCH

Researchers Pinpoint More Precise Method for Atomic-Level Manufacturing

QUANTUM COMPUTERS HAVE the potential to transform fields such as medicine, cybersecurity and artificial intelligence by solving hard optimization problems that are beyond the reach of conventional computing hardware.

But the technology to manufacture the devices on a large scale does not yet exist.

Researchers at UT Dallas have developed a technique that could remove one of the challenges to scaling the production of silicon quantum devices. The researchers outlined their method, which provides greater control and precision during the fabrication process, in a study published in the July 2020 issue of the *Journal of Vacuum Science & Technology B*. Silicon is the preferred material for the base of quantum devices because of its compatibility with conventional semiconductor technology.

The study's corresponding author, Dr. Reza Moheimani, the James Von Ehr Distinguished Chair in Science and Technology and professor of systems engineering in the Erik Jonsson School of Engineering and Computer Science, received a \$2.4 million Department of Energy grant in 2019 to develop technology for atomically precise manufacturing, the process of building new materials and devices atom by atom.

Moheimani's team is addressing a range of challenges to quantum-device fabrication.

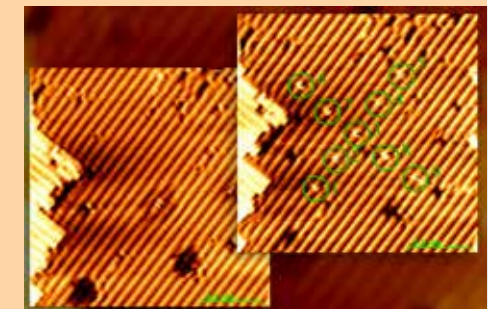
"Our latest work increases the precision of the fabrication process," Moheimani said. "We're also working to increase throughput, speed and reliability."

The researchers' method for building a silicon-based qubit — or quantum bit, the basic unit of information in a quantum computer — starts with an atomically flat silicon surface coated with a layer of hydrogen, which prevents other atoms or molecules from getting absorbed into the surface. Next, researchers use a scanning tunneling microscope (STM), which features a probe with an atomically sharp tip, functioning as a micro-robotic arm, to remove atoms of hydrogen selectively from the surface. The STM was designed for imaging atomic features on a surface; however, researchers also use the device to manipulate atoms in a mode called hydrogen depassivation lithography (HDL).

The researchers found that they could achieve higher precision by performing HDL in imaging mode, rather than the conventional lithography mode, with some adjustments to the voltage and a change to the STM's feedback control system.

"We realized that we could actually use this method to remove hydrogen atoms in a controlled fashion," Moheimani said. "This came as a surprise. It's one of those things that happens during experiments, and you try to explain it and take advantage of it."

-Kim Horner



COMMUNITY

UT Dallas Adds to New Richardson Innovation Quarter

UT DALLAS IS partnering with the city of Richardson to support the region's startup and entrepreneur community by establishing a physical presence in the Richardson Innovation Quarter.

UT Dallas will locate five new research centers and an extension of its Venture Development Center (VDC) in the district, also known as the Richardson IQ, or The IQ. A 1,200-acre hub for innovation and entrepreneurship, the initiative aims to stimulate collaboration across businesses, attract new jobs and strengthen partnerships between the University, the city and the business community.

"Place matters, in many ways, more than ever," said Steve Guengerich, associate vice president for innovation and commercialization at UT Dallas. "The Richardson IQ vision for the coming years is to be at the top of the list of places where people choose to live, work, learn and play. We are thrilled to be part of this vital new development."

The five research centers, which were awarded seed fund grants by the Office of Research, will fall under the umbrella of the University's new Centers for Emergent Novel Technology at the Innovation Quarter (CENT-IQ), which will be led by Guengerich. Each research center will focus on solutions related to specific technological specialties, including applied artificial intelligence, machine learning, imaging and surgical innovation, and smart mobility.

"As a Tier One research institution, one way we impact society is by moving innovation from the bench to the marketplace. The Richardson IQ will be a nexus for university and industry engagement to facilitate translation and commercialization," said Dr. Joseph Pancrazio, vice president for research and professor of bioengineering. "I have every expectation that the University's engagement at The IQ will have a long-term and lasting economic impact on our region."

The VDC is a UT Dallas incubator designed to help students, faculty and alumni commercialize their ideas and inventions. The center offers a series of free and paid programs on location, including startup boot camps, speaker series, sales and marketing assistance for startups, mentor office hours, networking events and startup internship opportunities.

The newest VDC space and the CENT-IQ research centers will be located at 1302 E. Collins Blvd., owned by the city of Richardson and featuring research, co-working and lab spaces. UT Dallas will occupy approximately 10,000 square feet of the 27,500-square-foot building. Construction will begin this summer, with an opening planned for February 2022.

-Brittany Magelssen



PHILANTHROPY

Couple's Gift to Center for Values Focuses on Human Side of Medicine

WITH A LEADERSHIP gift to UT Dallas' Center for Values in Medicine, Science, and Technology, a local doctor and his wife hope to encourage students to focus on the human side of medicine.

Dr. Marvin Stone, chief emeritus of hematology and oncology at Baylor University Medical Center in Dallas and a clinical professor in the UT Dallas School of Arts and Humanities (A&H), along with his wife, Kathy, have created the Marvin and Kathleen Stone Distinguished Professorship of Humanities in Medicine and Science and the Marvin and Kathleen Stone Scholarship/Fellowship. The endowments are intended to grow the impact of the Center for Values as it relates to how

values, culture and humanities interact with medicine and science.

"Medical students and physicians tend not to have enough humanities in their education, but I believe the art of medicine is just as important as the science of medicine," said Stone, "so I've been interested in trying to further humanities in medicine, in medical school and at the University."

The professorship will support a tenured professor who focuses on the intersection of values and the humanities with medicine and science. Likewise, the scholarship fund will assist students with similar interests.

The Center for Values, which is part of A&H, is focused on recognizing the ways that ethics,

values and culture interact with medicine, science and technology, with the goal of pursuing relevant research.

"Coming up through college and medical school, there seemed to be a skewed emphasis on science at the expense of humanities. I didn't think it was balanced appropriately — with enough attention to the humane aspect of medicine and illness. That's why I am so interested in this topic," Stone said.

Stone was on the faculty at UT Southwestern Medical Center for years and later served as the first chief of oncology and director of Baylor's Charles A. Sammons Cancer Center.

-Phil Roth



ARTS AND CULTURE

'AIDS Quilt Touch' Stitches Together Tapestry for Digital Age

THE AIDS MEMORIAL Quilt began in 1985 with a few people who wanted to ensure that their loved ones who had died from AIDS would be remembered. Thirty-five years later, a technology project spearheaded by leaders in the School of Arts, Technology, and Emerging Communication (ATEC) at UT Dallas enables people all over the world to view the panels of those who are memorialized in the quilt.

The AIDS Memorial Quilt, now part of the National AIDS Memorial in San Francisco, is a 54-ton tapestry that includes more than 48,000 panels dedicated to more than 100,000 individuals. The quilt is considered the largest community arts project in history.

Because of its size — it would take more than 50 miles to display — the quilt no longer can be shown in one location; however, an interactive application called AIDS Quilt Touch offers users the ability to search and view the quilt digitally. Before they joined UT Dallas,

Dr. Anne Balsamo and Dale MacDonald

received funding from the National Endowment for the Humanities in 2011 to create the beta version of the application.

MacDonald, ATEC associate dean of research and creative technologies, who led the technical part of the project, developed the code to "stitch" together over 6,000 high-resolution images of quilt blocks.

"We have access to all of the data about who is named on each panel of the quilt and who made the panel," he said. "To make it possible for users to find that information, we built a search engine that linked it to positions within the digital quilt. It takes a lot of computational power to search such a large visual image."

Balsamo, professor of ATEC and holder of the Arts and Humanities Distinguished Chair at UT Dallas, said she was pleased that many more people can now learn more about those who are remembered in the quilt.

"When AIDS Quilt Touch launched as an interactive web application, it was the first time that people across the globe could visually explore the quilt by zooming in and out and panning across the expansive visual image," she said. "We had a prototype running for 15 years, but we were limited in how we could present it. People are drawn in when they see images of panels, but what they want to know is, 'Tell me about that person that I'm seeing, that beautiful panel that I'm seeing. Who is that person?'"

Over the past decade, the AIDS Quilt Touch has involved more than 50 collaborators across the U.S.

-Phil Roth



"It was the first time that people across the globe could visually explore the quilt by zooming in and out."

- Dr. Anne Balsamo



From left: Dr. Matthew Brown, director of the Center for Values in Medicine, Science, and Technology; Kathy Stone and Dr. Marvin Stone; and Dr. Magdalena Grohman, associate director of the Center for Values.

RESEARCH

Thermal Imaging Enhances Engineers' Understanding of Breast Tumors

THERMAL IMAGING HAS been available for decades to detect temperature differences on the skin that could signal breast cancer without exposing patients to radiation, although the method is not as reliable as mammography.



Dr. Fatemeh Hassanipour, corresponding author of the study and associate professor of mechanical engineering in the Jonsson School, said their goal is to improve digital thermal imaging as a tool for monitoring cancer and its treatment, rather than replacing cancer screening by mammograms.

"Infrared imaging could potentially provide useful information in a diagnostic setting to radiologists," Hassanipour said. "We want it to be used like a second device for monitoring tumors."

New research performed at UT Dallas and published June 22, 2020, in *Nature Research's Scientific Reports* takes a critical step toward making digital infrared thermal imaging more useful for monitoring breast cancer.

Engineers in the Erik Jonsson School of Engineering and Computer Science, working with radiologists at UT Southwestern Medical Center, recruited 11 female patients who volunteered for the study through UT Southwestern and Parkland Health & Hospital System in Dallas. The team used a high-resolution infrared camera, clinical data from patient volunteers, 3D scanning and computer-aided design to build a proof-of-concept computer model of the thermal properties of breast cancer.

The research utilized thermal imaging, with the infrared camera taking images of the skin, to identify temperature changes generated by breast cancer as it induces changes to the local vasculature and cellular metabolism. The technique only shows patterns of heat and blood flow on or near the surface of breasts, however, leaving unknown information about tumor activity deeper in the breast tissue.

The UT Dallas researchers worked to address this issue by applying engineering tools to imaging data to develop a model that quantifies the thermal characteristics of breast cancer throughout one patient's



breast. The results showed a detectable temperature difference in metabolic heat generation between the patient's normal and cancerous breasts. They also noted increased perfusion rates, which is the rate of blood flow through a given volume, in the affected breast.

Hassanipour's work is supported by a National Science Foundation Faculty Early Career Development Program (CAREER) award, which she received in 2015 to study the biomechanics of breastfeeding.

-Kim Horner

RESEARCH

Marketing Study Investigates Impact of Viagra TV Ads on Birth Rates

MANY MARKETING STUDIES have examined the impact of direct-to-consumer advertising of pharmaceuticals on sales and market shares. But in a recent study, a researcher from UT Dallas wanted to know whether drug advertising might have some unintended, population-level health consequences.

"A colleague and I wondered, 'Can Viagra ads result in more babies?'" said Dr. Tongil "TI" Kim, assistant professor of marketing in the Naveen Jindal School of Management and one of the study's co-authors.

In the study, published in the August 2020 issue of the *Journal of Marketing Research*, Kim and Dr. Diwas KC of Emory University explored the impact of direct-to-consumer advertising of erectile dysfunction (ED) drugs on birth rate at the population level.

The researchers examined local television commercials for three drug brands: Viagra (sildenafil), Levitra (vardenafil) and Cialis (tadalafil). They compared advertising data with hospital data from Massachusetts between 2001 and 2010, and with 15 million birth certificate records from the U.S. between 2000 and 2004.

They used a type of quasi field experiment — a way to show causality in economics and marketing — to address many potential confounding factors. They examined two sets of adjacent rural ZIP codes with similar characteristics, where one side received more ED drug ads than the other side.

Additionally, the researchers considered other variables that might have affected increased birth rates during these time periods, such as inclement or cold weather, and determined those factors were not major concerns in the study's setting. They also replaced ED drug advertising with advertising for an unrelated drug category and found no impact on birth rates.

The researchers found that in ZIP codes where more ED drug ads ran than in neighboring ZIP codes, the birth rates were higher 10 months after the advertising aired. Their results showed that a 1% increase in ED drug advertising contributed to an increase of 0.04% to 0.08% of total births. They also found the ads particularly increased births among families with children.

The researchers believe that some viewers watched the ads and purchased ED drugs

to improve their chances of achieving pregnancy (consumption effect), while others may have been affected by the suggestive nature of the ads without purchasing ED drugs (media effect).



The researchers said their study could provide companies a framework to monitor unintended health consequences in relation to the launch and marketing of pharmaceutical goods.

The Food and Drug Administration relaxed restrictions on direct-to-consumer advertising in 1997. Since then, TV advertising for pharmaceuticals increased substantially, with more than 80 drug ads aired every hour on U.S. television.

-Brittany Magelssen

RESEARCH

Record Number of Faculty Earn CAREER Research Awards

THE NATIONAL SCIENCE Foundation's (NSF) Faculty Early Career Development Program supports early-career faculty who exemplify the role of teacher-scholars through outstanding research and excellent education. The highly selective program is the NSF's most prestigious award for faculty who are considered likely to become leaders in their fields.

In the most recent complete funding cycle that ended in 2020, seven UT Dallas faculty members received NSF CAREER awards, the most for the University in any round of funding. The grants typically provide five years of financial support for research.



DR. KYLE FOX, assistant professor of computer science, for research on algorithmic foundations of computer science and their relationship to geometry and topology.



DR. QING GU, assistant professor of electrical and computer engineering, to expand her work on novel lasers.



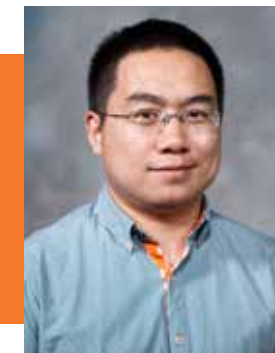
DR. YANG HU, assistant professor of electrical and computer engineering, to develop new hardware and software for automated driving systems.



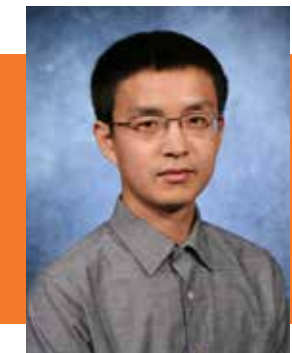
DR. MICHAEL KOLODRUBETZ, assistant professor of physics, for research on nonequilibrium quantum systems.



DR. FARUCK MORCOS, assistant professor of biological sciences, for research on biomolecule evolution and the effects of mutations on protein function.



DR. FAN ZHANG, associate professor of physics, for research in quantum physics and topological superconductivity.



DR. LINGMING ZHANG, for work to advance automated debugging technology. He is now at the University of Illinois at Urbana-Champaign.

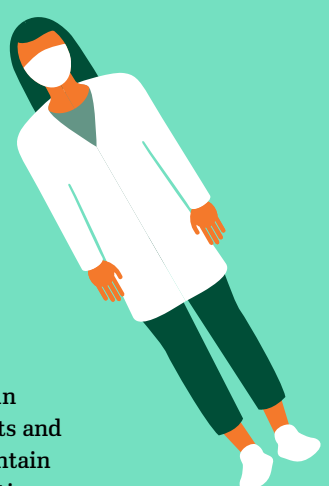
Comets



United



In the face of a global public health crisis, the UT Dallas community unleashed its creativity and sparked a reimagining of higher education that has allowed the University to thrive.

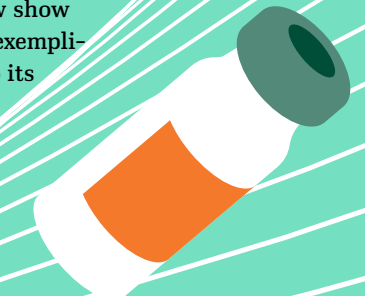


THE COVID-19 PANDEMIC that began in early 2020 has had a tremendous impact on universities around the globe. At The University of Texas at Dallas, the ongoing situation has presented challenges as well as opportunities, not only in the continuity of teaching and learning, but also in areas like research, housing, student life and the day-to-day business of keeping a campus up and running, no matter what.

By necessity, the UT Dallas community was forced to **reimagine** a university experience without the trappings of a physical campus; students, staff and faculty had to reinvent what they knew and expected of higher education by working and learning off-site without knowing when or even how they would return. Under the thoughtful and steadfast leadership of President Richard C. Benson and his administration — and the herculean efforts of countless

individuals — UT Dallas continued to deliver an exceptional educational experience to its students and responded in creative — and safe — ways to maintain all the other aspects that make UT Dallas a top-tier institution — **research**, service, sense of community and commitment to excellence.

Even as individuals have dealt with their own personal challenges, the Comet family has risen to the occasion. UT Dallas' **response** required coordinated logistics and quick decision-making by University administrators, who put into motion plans to maintain the health and safety of the community while also preserving continuity in a rapidly changing, uncharted world. The snapshots that follow show how united, Comets found their footing and exemplified the University's spirit and dedication to its mission of teaching, research and service.



REIMAGINING

Just after spring break in March 2020, shelter-in-place orders and public health guidelines went into effect, and campus operations were curtailed, sending most UT Dallas faculty, staff and students to work and learn remotely. Videoconferencing and other technological assists were the backbone of content delivery as virtual events became the centerpiece of the reimagined university experience.



Three-year-old Ben Wallace watches as Callier Center speech-language pathologist Paige Burkink works with him via telehealth.



Telehealth at Callier Center

AS UT DALLAS MOVED CLASSES online in spring 2020 and closed most campus offices due to COVID-19, another decision had to be made about the University's Callier Center for Communication Disorders — how to continue treating its 4,000 patients and how to facilitate the clinical experience needed by graduate students to complete their degrees.

The Callier Center is one of the University's few centers where patients — both children and adults — are seen regularly. It also provides hands-on training for graduate students pursuing degrees in speech-language pathology and audiology through the School of Behavioral and Brain Sciences.

Dr. Andrea Gohmert, Callier director of audiology clinical operations, said the clinical team moved quickly to a telehealth model.

"We did about 10 years of work in 10 days," she said. "We identified a safe platform to provide every possible service that didn't involve actual contact with a patient."

Security was the primary concern of the transition to online services; the system had to meet medical privacy standards. By the first of April 2020, the telehealth program was in full use, allowing most Callier patients access to audiologists, speech-language pathologists and clinical staff.

While diagnostic testing cannot be done remotely, audiology patients have received basic services, such as hearing-aid adjustments. For most hearing aids, the audiologist can make modifications by accessing the patient's individual prescriptive programs remotely.

"It's still not ideal; face-to-face would be better. But I can't tell you the angst a parent must feel. They may be home all day with a child who can't hear, so they need that hearing aid working properly," Gohmert said.

Most therapy services also transferred well to the telehealth environment.

Another major part of Callier's role at UT Dallas is to provide hands-on clinical experiences to graduate students training to be audiologists and speech-language pathologists.

Students have been able to earn clinical hours by joining clinicians on telehealth visits and by using an online case-management system that presents various patient scenarios for students to work on together.



From her home in Massachusetts, visual and performing arts senior Melinda Kalanzis prepares to record a scene from "Faust."

University Theatre Turns to Radio

WHILE THEATER COMPANIES and musical organizations around the country shut down productions during the COVID-19 pandemic, UT Dallas' theatre program creatively improvised, ensuring that "the show must go on."

The program's spring 2020 production, "Faust," was planned to be a big stage event, with a guest director, two professional actors, outside costume and scenic designers, and a guest composer — all complementing the student actors, musicians and production crew. In mid-March, however, it became clear that the production could not occur as planned.

Shelby Hibbs, clinical assistant professor in the School of Arts and Humanities and producer of the production, said it was important that the play continue for a number of reasons, one of which was that it was a new version, translated by Dr. Zsuzsanna

Ozsváth, professor of literature and history, and Dr. Frederick Turner, Founders Professor of literature and creative writing, both of whom retired last fall.

Very quickly, a solution was found: The stage play became a radio play, complete with student-generated music, audio effects and a robust website to provide the audience with the feel of the play's period.

"I wanted to honor the work that the translators had done," Hibbs said.

Although the participants were all restricted to their homes, rehearsals continued through videoconferencing and recording software. High-quality microphones were distributed to the actors, who worked in groups to record various scenes.

"It was a herculean effort to put this together," said Raphael Parry, guest director of "Faust." He said the cast and crew worked diligently to pivot the production, although the technical issues of working remotely were sometimes a challenge.

"There were certain tactical things we couldn't control," said Parry, who is the executive and artistic director at Shakespeare Dallas. "If we had a bad computer signal from one of the actors, then we would lose the entire take. Because of Wi-Fi issues, we lost a couple of evenings of work."

Visual and performing arts senior Hayden Lopez said that while performing in a radio play was different than a stage production, it was fun to learn a new aspect of acting.

"In radio, attention to the spoken language has to be much more precise," Lopez said. "You have to have a lot more inflection in your voice, and you have to be able to really paint a picture with your words because you lose the visual aspect."

Summer Research for Master's Students

IN 2020 UT DALLAS BROADENED the scope of its summer research activity with a fellowship program for master's students.

The Office of Research and the Office of Graduate Education partnered to establish the Master's Research Fellowship Program (MRFP), which encouraged UT Dallas master's students to engage in research by awarding \$1,500 each to 56 students across a wide range of disciplines. Because on-campus research operations were limited due to the COVID-19 pandemic, most projects were performed remotely.

"UT Dallas greatly values the master's students who come from all over the world to our academic village," said Dr. Joseph Pancrazio, vice president for research and professor of bioengineering. "This program aims to accelerate scholarly engagement between our outstanding international and domestic graduate students and our world-class faculty."

The COVID-19 pandemic left many students in financial difficulty. The fellowship program not

only provided educational opportunities but also a crucial infusion of resources.

"The Master's Research Fellowship Program came at the right time, when so many were struggling with the effects of the pandemic," said Dr. Juan González, dean of graduate education and the Francis S. Johnson Chair for Graduate Education. "It provided our master's students an incentive to expand their research activities while pursuing their degrees, and it increased faculty-to-student interactions."

González, who also is a professor of molecular and cell biology, believes the program can have a long-term positive effect on the profile of students attending UT Dallas for graduate studies.

"The Office of Research should be praised for its timely recognition of the opportunities and help that this fellowship program can bring," he said. "I hope that it becomes a signature program that will help attract and retain top-quality graduate students from all over the world."

Students in the sustainable development goals service learning class, led by instructor Gary Cocke (fourth from right, rear row), raised funds for the North Texas Food Bank.



'Whooshing' Away Hunger

STUDENTS IN A SUSTAINABILITY service learning class at UT Dallas put their knowledge to work in spring 2020 with a virtual fundraising and donation campaign called #WhooshAwayHunger to support the North Texas Food Bank during the COVID-19 outbreak.

Students in the UNIV 3310 class Sustainable Development Goals: Local Action to Address Poverty and Hunger had zeroed in on hunger and food insecurity after studying the 17 Sustainable Development Goals initiated by the United Nations.

"We learned that poverty and hunger had the highest impact on people's physical and mental health. You cannot sustain without food. If your basic needs aren't met, you can't contribute to society," said Harshini Rallapalli BS'21, a new cognitive science graduate in the School of Behavioral and Brain Sciences who took the course as one of her electives.

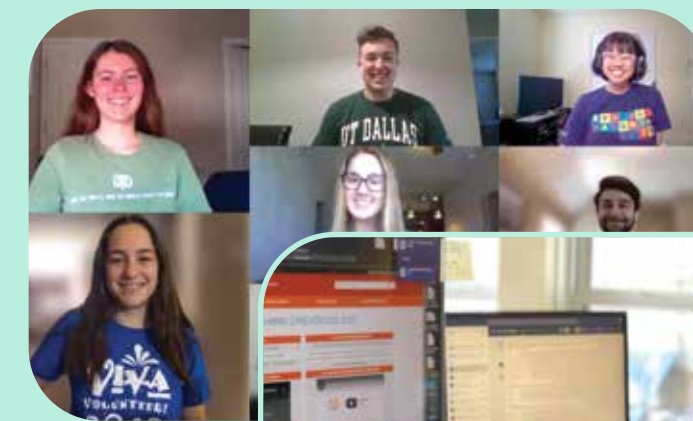
When the coronavirus hit, the class quickly shifted gears to help with a real-life local problem and began focusing their efforts on supporting the local food bank.

The North Texas Food Bank works closely with more than 200 food pantries, soup kitchens, shelters and other facilities in North Texas to get nutritious food to those who need it. As many businesses closed and more Texans became unemployed, the food bank needed additional resources.

The sustainability class is part of the University's growing community-based service learning program, which gives students the opportunity to explore new topics while serving as teachers and mentors in the community.

Anna Kurian, senior director of marketing and communications for the North Texas Food Bank, said the organization was grateful for the students' help because the COVID-19 pandemic is unlike anything the region has ever seen.

"The need in the community is unprecedented, and luckily there is a caring community working to make a difference," Kurian said. "Our team was thrilled to learn that our neighbors at UT Dallas wanted to get involved. Their innovative campaign to bring in donations of food and funds couldn't have come at a better time. We are grateful for their unwavering support."



Virtual Orientations

STUDENT ORIENTATION AT UT DALLAS is typically a time for students to familiarize themselves with the campus, meet other students and make new friends, complete course registration, and learn about the University's services and resources.

With on-campus activities suspended due to COVID-19, UT Dallas helped new freshman, transfer and international students become acclimated to University life — even at a distance — through its first virtual orientations last summer.

"We wanted to capture a sense of community for them even though they couldn't meet in person," said Daniel Long, director of student transition programs in Student Affairs.

UT Dallas had a head start on transitioning to virtual orientations because for several years new students have received pre-orientation modules to complete online. Staff expanded those modules to include videos and interactive quizzes.

"We're fortunate to have used e-learning for pre-orientation modules. We've had an existing platform for a few years, so we were ahead of many universities," Long said.

Instead of in-person presentations that typically happened during summer orientation sessions, campus administrators provided video messages of welcome. Staff further engaged new students through virtual small group meetings using Microsoft Teams, which also was used for an online panel session for families of new students to ask questions and learn about campus resources.

During a virtual Comet Camp, staff and returning student leaders presented UT Dallas traditions, such as the Whoosh. They also provided tips on relationships, communication and success in college, and allowed incoming students to showcase their skills at a virtual talent show.

"One of the things that has been lost with COVID-19 is the sense of community and belonging. We wanted to help make that happen through small group meetings, interest-based lunches and presentations," Long said.



A 2020 Ceremony for All Seasons

AS WITH SO MANY ASPECTS of university life, the COVID-19 pandemic threw a curve at the traditional pomp and circumstances of on-campus commencement ceremonies and cast a pall on the fellowship with friends and family that typically happens during graduation season.

So UT Dallas adapted by recognizing graduates Dec. 14 in an expanded virtual commencement ceremony that included all members of the Class of 2020, whether they completed their studies in spring, summer or fall.

The University recognized 3,603 summer and fall graduates, but the virtual ceremony included a reading of the names of all 8,469 graduates from 2020, whose ceremonies were not able to be held in person earlier in the year. The University still plans to celebrate the Class of 2020 and spring 2021 graduates at an in-person commencement ceremony in August.

The main commencement video included elements of a traditional ceremony, including a congratulatory message from the president and remarks from the provost. A virtual tour of campus and a performance of the alma mater also were included in the online event.

Each of the University's eight schools were highlighted in videos that featured remarks from the schools' deans, and the reading and display of graduates' names. Graduates' names also were posted in a digital commencement program. The virtual commencement ceremony will be kept live for a year on the website.

In addition, each of the graduates had the opportunity to receive a special celebration package in the mail.

Back in the Game

THE UNIVERSITY'S 17 sports programs — including the new track and field program — were all in action when UT Dallas' parent league, the American Southwest Conference (ASC), decided to provide fall sports with the opportunity to play a condensed schedule in spring 2021.

"The University worked with the American Southwest Conference to set up COVID protocols — policies and procedures that allow us to have a safe environment to host our teams, the teams that come in from within the league and limited seating for some fans," said Bill Petitt, director of athletics for the University. "The fall sports played a half-season schedule. The spring sports have been fairly normal."

The NCAA Sport Science Institute provided guidelines on COVID-19 testing of student-athletes, including twice-a-week testing in-season. In addition, the ASC required a negative test within 72 hours before competition.

"By the end of March, we'd conducted more than 5,000 tests since the beginning of the fall 2020 semester," Petitt said.

Several UT Dallas teams are ranked in the top 25 nationally in NCAA's Division III. The men's cross country team won its third straight conference championship, while the women's golf team won its first-ever conference title. The baseball team and women's tennis team were also conference champions.

"It's a credit to our coaches that even with this situation, our student-athletes are continuing to play at a high level," Petitt said.



The track program officially debuted Feb. 27, 2021, with two men's sprinters competing at Hardin-Simmons University. The women's team debuted March 13 at UT Tyler.

Although the NCAA has allowed student-athletes whose seasons were affected by the pandemic an extra year of eligibility, Petitt does not anticipate more than a handful of Comets taking advantage, if any.

"Most of our student-athletes are anxious to get into the workforce," he said.

Though Petitt and his staff continue to monitor the pandemic, he believes fall sports will be able to run at 100% capacity next semester.

"We look forward to our fall sports teams having the opportunity to again play a full-length season, with fans in attendance to support their Comets," Petitt said.

Virtual Dissertations with a Degree of Success

DR. JUAN GONZÁLEZ, dean of graduate education, was excited at the prospect of UT Dallas having the largest number of dissertations in its history in the spring 2020 semester. So when the COVID-19 pandemic caused the University to move its classes and most services online, González and his team moved quickly to ensure that every eligible doctoral student would have the opportunity to make a defense, which is the final step in qualifying for a doctoral degree.

The day after spring break 2020 ended, all remaining doctoral defense meetings were moved online.

"Throwing in a monkey wrench like this at the last minute was difficult for these students," González said. "They had been looking forward to the defenses, and their family members had been excited as well."

Since online defenses had never been done at UT Dallas, students, faculty and the Office of Graduate Education (OGE) wanted this important moment to go without a hitch.

"It was a different platform than I was expecting. I was hoping to participate in an in-person meeting so I could see everyone and engage with them," said Adolfo Lozano PhD'20, a mechanical engineering alumnus whose defense was moved online.

The OGE staff worked with each PhD candidate and each participating faculty member to ensure a smooth process. González said

students could choose the videoconferencing platform they preferred so that they would be comfortable with the technology. Students who did not have Wi-Fi or a strong signal were helped to find better locations, and faculty members learned how to use various software functions, such as a virtual waiting room so that faculty could privately discuss the student's defense performance.

Lozano said that despite his initial concerns, everything went well.

"I think having the comfort of being at home helped some. Otherwise it was normal. I was still dressed up in a suitcoat and tie, although I told the committee that they couldn't prove that I didn't have shorts on," he said.

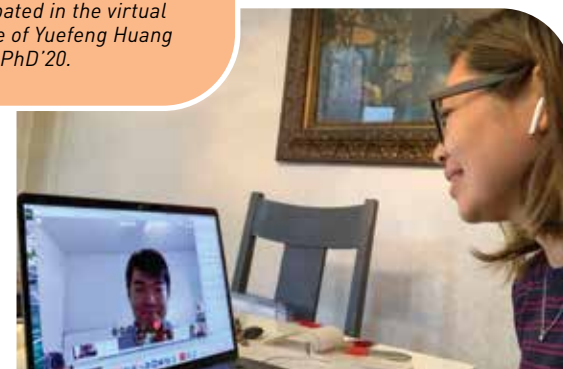
One benefit of the online meetings was that more friends and family were able to watch and listen to the public portion. In all, 210 doctoral dissertations and 55 master's theses were defended virtually in 2020.

While some U.S. universities postponed their dissertation defenses because of the COVID-19 crisis, González said that was never an option at UT Dallas.

"The first degree that this University awarded was a PhD in physics. This is who we are," González said. "We have never had one semester in our 50 years of history without at least one PhD student graduating. We wanted to make this possible, and I'm glad we did."



Adolfo Lozano PhD'20 (top) defends his dissertation, and Dr. Francesca Filbey (bottom), professor in the School of Behavioral and Brain Sciences, participated in the virtual defense of Yuefeng Huang MS'17, PhD'20.



RESEARCH Faculty members and Office of Research staff kept the University's research enterprise moving forward even as on-campus research operations transitioned to maintenance-only mode in the early days of the pandemic. During the shutdown, researchers engaged in important activities outside the lab, such as writing journal articles and grant proposals and analyzing data. As research operations return to pre-pandemic levels, investigators and faculty experts continue to inform public policy and increase our understanding of COVID-19 and its impact on society.

Good Data Critical for Good Policy

IN MAY 2020, DR. TIMOTHY BRAY, associate professor of practice of public policy and political economy and director of the Institute for Urban Policy Research at UT Dallas, launched an online dashboard of COVID-19 information to help policymakers and the public view near-real-time data.

Drawing from national and regional data sources, the North Texas COVID Data Viewer (utd.link/covid-dashboard) was designed to enable timely, data-informed decisions on issues of policy and practice. The interactive website offers a cohesive view of the pandemic by combining hard-to-navigate, publicly available COVID case information with nonpublicly accessible data, such as hospital utilization and COVID testing information.

The site, which compiles data for 13 North Texas counties, has evolved since the beginning of the pandemic, and now includes multiple categories of data, including seven-day rolling averages of infection rates and deaths, the number of lab-confirmed COVID-19 patients, and a hospitalization page that allows users to track total capacity, emergency room visits, intensive care unit capacity and ventilator utilization over time.

Once COVID-19 vaccines began to roll out, Bray and his team added vaccination data status and demographics to the dashboard.

Municipal and county officials have used the dashboard to inform policies and procedures as conditions have changed over the course of the pandemic. Business leaders have also used the tool for day-to-day business operations, Bray said. For example, one company uses the tool to brief its board of directors on gradual return-to-work plans, and several CEOs have thanked the University for making the information so accessible.

Bray also adapted the dashboard to support UT Dallas' human subjects research program to ensure that research study participants and researchers were protected at all times. Another version of the dashboard was prepared to support local Texas Division of Emergency Management operations.

There are no plans to shut down the dashboard any time soon, Bray said.

"As long as there are decisions to be made, we'll make sure that policymakers have the data they need," he said. "The pandemic has helped illustrate the contribution that timely data can make to public policy, and it has underscored the importance of degrees like our Master of Science in social data analytics and research."

How COVID-19 May Increase Lung Problems

FOR MORE THAN A YEAR, scientists around the world have been racing to find ways to combat the most severe symptoms of COVID-19. Researchers at UT Dallas recently pinpointed a potential strategy for counteracting the acceleration of the illness in the lungs.

Fourteen scientists from the Center for Advanced Pain Studies (CAPS), a component of the School of Behavioral and Brain Sciences (BBS), collaborated on a project to determine if the pulmonary issues associated with SARS-CoV-2, the coronavirus that causes COVID-19, could originate with the nervous system.

Their study, published in the October 2020 issue of *Brain, Behavior, and Immunity*, identifies interactions between the immune system and nerves in the lungs that can cause rapid deterioration in a COVID-19 patient's condition. Some of these interactions might be countered by existing drugs, they said.

It's widely understood that severe cases of COVID-19 can have a major inflammation component that seems to start in the lungs, then affect the rest of the body. Analyzing publicly available data from patients in China, the CAPS team investigated this process as a potential case of neurogenic inflammation, in which the immune system and nervous system interact in a vicious cycle, leading to runaway inflammation.

"Most people, even biomedical researchers, don't fully appreciate how much the nervous system interacts with every organ in your body," said Dr. Ted Price BS'97, CAPS director, Ashbel Smith Professor of neuroscience, and corresponding author of the study. "When you have a disease, the way the immune system and the nervous system interact is very important for the outcome of the disease. The better we understand this, the better we'll be at making sure that patients don't go from being pretty sick to being in the ICU and on a ventilator."

Price explained that COVID-19 patients who become severely ill mainly suffer from acute respiratory distress syndrome, or ARDS.

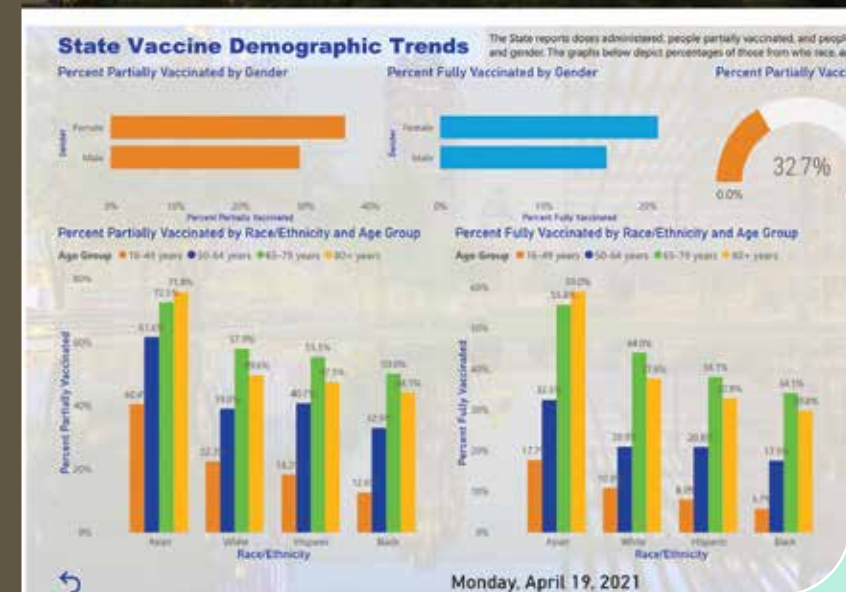
"These people can't get enough air from breathing to saturate their blood with oxygen, and that makes them very sick," Price said. "Some need ventilators; some people die from it."

In March 2020, when Price initiated this research, knowledge of the course of the disease was still limited, but it had been noted that patients with ARDS had undergone what's known as a "cytokine storm," in which the body quickly releases too many of a broad category of signaling proteins produced by the immune system.

"A lot of treatments try to curtail the cytokine storm by targeting the immune cells themselves," said Dr. Michael Burton, a BBS assistant professor and co-author of the study. "But evidence from our study shows an interaction with neurons, immune cells and other cells in the lungs that could provide a novel therapeutic targeting strategy."

The work was supported by the National Institutes of Health.

County Data Dashboard



Preparing for New Disease Outbreaks

THE AVAILABILITY OF ADEQUATE health care facilities is one of the most important factors that public health policymakers grapple with when preparing for infectious disease outbreaks.

And one of the most critical resources for controlling infectious respiratory diseases is the negative-pressure isolation room (NPIR). In a study published in the November 2020 issue of the *International Journal of Health Policy and Management*, a UT Dallas researcher investigated the allocation process and spatial distribution of NPIRs in South Korea during past outbreaks.

NPIRs work by lowering the air pressure in a patient's room relative to hospital hallways or other rooms, a configuration that pulls air into the room and prevents airborne diseases from escaping to infect others.

Dr. Dohyeong Kim, associate professor of public policy and political economy and of geospatial information sciences in the School of Economic, Political and Policy Sciences, is one of the study's co-authors.

"We are experiencing a very serious pandemic with COVID-19, and the actual outcomes are directly related to the amount of resources that each

country has, that each community has, and also that each hospital has," said Kim.

In the study, Kim and his co-authors proposed that evidence-based spatial allocation methods can highlight gaps in preparedness and indicate specific locations to which governments should allocate funds to install more NPIRs.

Using historical data from past outbreaks of respiratory disease in South Korea, Kim and his colleagues conducted chronological geographic information system (GIS) mapping to illustrate the variation of NPIR allocation.

The study revealed that there was no science- or evidence-based allocation of health resources in South Korea because of politics-oriented decision-making and a lack of expertise. Big cities, including Seoul, received the most funding and resources, while rural areas lacked necessary facilities.

The researchers warn that NPIR allocation driven by political or administrative convenience is likely to result in unequal resource distribution. Instead, they suggest using technology and data to implement an evidence-based approach.

The work was supported by an Incheon National University International Cooperative Research Grant.



Protecting COVID-19 Patient Privacy

THE COVID-19 PANDEMIC has created an urgent need for sharing patient data to help scientists learn more about the virus and how to stop it from spreading. One key ethical issue, however, is how much information can health providers disclose to researchers without violating patient privacy?

Dr. Murat Kantarcioglu, Ashbel Smith Professor of computer science in the Erik Jonsson School of Engineering and Computer Science at UT Dallas, jointly with Vanderbilt University Medical Center, received a \$200,000 grant through the National Science Foundation's Rapid Response Research (RAPID) program to create an open-source software tool to help policymakers and health care providers make those decisions.

The NSF's RAPID program supports nonmedical, nonclinical-care research related to modeling and understanding the spread of COVID-19; informing and educating about the science of virus transmission and prevention; and encouraging the development of processes and actions to address the global challenge.

"The issue is: What kind of details can we give to researchers

while protecting a patient's privacy?" Kantarcioglu said. "It's possible that disclosing certain features about a patient's medical history may make it easier to identify a person."

Epidemiologists use patient data to create statistical models to predict the potential spread of disease and to determine what factors might make specific populations more at risk. Much of the data used for research comes in the form of aggregate statistics. For coronavirus, however, person-level data is critical to understanding how various health factors might affect the virus's spread and impact individuals.

The UT Dallas project focuses on the risks of an individual being identified when patient data is released for research purposes. The decision tool Kantarcioglu is developing could evaluate whether releasing data about patients' locations or medical histories — such as smoking history or prescription drug use — increases the risk of identification.

"We would like to give researchers as much data as possible for this kind of analysis," Kantarcioglu said. "But we want to make sure that the risk of a person being identified is low."

Students' Innovation Helps Docs

EMERGENCY MEDICINE PHYSICIAN Dr. Carlos "Coco" Trigo wanted to find a way to apply a sterile cover to an ultrasound probe to perform ultrasound-guided procedures without having to find an extra pair of hands in the busy emergency room.

So Trigo, an assistant instructor and a fellow in simulation-based education at UT Southwestern Medical Center, sponsored a team of six engineering students in UT Dallas' UTDesign Senior Capstone Program to turn the two-person job into a solo task.

Trigo and others in the ER use the students' innovation on a daily basis, freeing medical workers and protecting patients from exposure to additional hospital staff. Trigo recently filed a patent on the design.

"During the COVID-19 pandemic, this device means that fewer medical personnel are needed inside a patient's room to perform these procedures, which equals fewer unnecessary exposures," Trigo said. He was so impressed with the students' work, he sponsored another related project.

The UTDesign team adapted the cup holder on a portable ultrasound machine so hospital workers can lock the ultrasound probe into place, allowing them to install the required sterile probe cover for ultrasound-guided procedures without assistance. The mechanism to hold the probe is made of a flexible material, like a bendable sink nozzle, so the doctor can orient the probe in any direction and install the sterile probe cover without the risk of coming in contact with unsterile surfaces.

"You can essentially use one hand to install the probe cover in a sterile manner," said Eric Busch BS'20, who led the team that worked on the senior project. He is now a student in UT Dallas' electrical engineering master's program. Teammates included Rebecca Finney BS'20, a master's student in systems engineering and management; Minh Nguyen BS'20; Madeline Powers BS'20; Carlos Ramirez BS'20; and Shahrzad Shahabi BS'20, a master's student in mechanical engineering.

The UTDesign capstone course gives Erik Jonsson School of Engineering and Computer Science seniors the opportunity to work with faculty and corporate mentors on real-world problems for sponsors. Busch said he and his teammates, who began the project in fall 2019, were on track until COVID-19 hit and the campus reduced operations and moved to online classes.

At the same time, emergency personnel needed the device more than ever to reduce the need for hospital workers to come into close contact with patients, he said.

The team created a temporary solution for Trigo while working on a more permanent design. The students ordered parts online. After they could no longer use the lab on campus due to the closure, one of the teammates printed custom parts on his personal 3D printer at home.

"We kept pushing through," Busch said. "Doctors come through for us, and we thought we should do it for them."



Telemedicine Eases ER Overcrowding

OVERCROWDING IN EMERGENCY rooms is a costly and concerning global problem, compromising patient care quality and experience. With a sharp rise in ER visits and critical shortages of emergency medicine physicians, ER overcrowding is not abating, particularly as the COVID-19 pandemic strained the capacity of hospitals nationwide.

In a study published in the September 2020 issue of the INFORMS journal *Information Systems Research*, a UT Dallas researcher explores whether telemedicine could enhance ER care delivery.

"This longstanding problem is mainly driven by the imbalance between increasing patient flow and the shortage of emergency room capacity," said **Dr. Shujing Sun**, assistant professor of information systems in the Naveen Jindal School of Management and lead author of the study.

"While the ER is supposed to be a safety net of the health care system, the overcrowding problem has strained this safety net and posits various threats," Sun said. "For example, long waiting times and treatment delays cause adverse patient outcomes, such as high readmission and mortality rates. They also increase financial costs, reduce patients' satisfaction and impair physician efficiency."

Sun said telemedicine, defined as the remote delivery of health care services and clinical information using telecommunications technology, has been gradually adopted in recent years, but there is little evidence on the impact of its applications within the ER setting.

"Telemedicine in the ER has two distinguishing features from home-based telemedicine," Sun said. "First, patients present in the ER. Second, on-site assistance is available to connect patients and off-site physicians throughout the telemedicine service."

Using a large data set covering all emergency visits in New York state from 2010 to 2014, the researchers found that the adoption of telemedicine in the ER significantly shortened average length of stay and wait time. ER telemedicine improves an on-call physician's efficiency through transportation elimination and smoother workflow, which can shorten a patient's wait for physicians.

The researchers replicated the analysis using annual U.S. hospital data and found that ER telemedicine adoption significantly reduces the average time a patient spends in the ER before being seen by a health care professional.

With the current global COVID-19 pandemic and the expanded use of telemedicine applications, Sun said telemedicine has shown its promise to protect patients and providers without compromising health care access.



Pandemic's Impact on Manufacturing

RESEARCHERS AT UT DALLAS have examined how manufacturers are — or aren't — pivoting successfully in response to major manufacturing disruptions as a consequence of the COVID-19 pandemic.

In a study published July 27, 2020, in *IEEE Engineering Management Review*, two faculty members from the Naveen Jindal School of Management found that manufacturing response to the disruption has been largely reactive and uncoordinated, and many firms' crisis communication plans do not include managing an infectious-disease outbreak.

The article offers practitioners and policymakers best practices for pivoting successfully.

"The research was an eye-opener in terms of understanding the challenges for manufacturers in dealing with such an abrupt, massive disruption," said Dr. Ramesh Subramoniam, clinical associate professor of operations management and one of the paper's co-authors.

"The COVID-19 pandemic brought everything to a standstill. Even before that, supply chain disruption frequency had increased in recent years. Establishing a resilient framework to meet such supply chain disruptions is the immediate need for practitioners," he said.

Manufacturing is one of the most severely affected sectors in terms of the negative economic impact, said Dr. David Widdifield, a co-author of the paper and clinical associate professor of operations management.

The researchers surveyed employees of manufacturing firms. Completed between June and July 2020, the study assessed online responses from 71 manufacturing practitioners across 39 facilities and six continents.

The research shows a lack of capability among some manufacturers to deal with the increased demand for new products, such as medical devices, while other manufacturers have the ability to pivot to a new normal.

"The study also brings forward the impact of digital technologies such as 3D printing, artificial intelligence and machine learning, and how they prime organizations to respond faster and be more resilient to such rapid disruptions in the future," Widdifield said.

The research also has implications for consumers, Subramoniam said. Companies were tested on how well they took care of their employees during the pandemic.

"The average consumer should look at how companies responded to the pandemic in treating them, their friends and relatives," he said. "These are very strong indications of an organizational culture and capability. Future employees want to work for such companies with a strong culture of product and process innovation and growth, with the employees as the core asset."



Tracking and Forecasting COVID-19

DR. YULIA GEL, professor of mathematical sciences in the School of Natural Sciences and Mathematics at UT Dallas, has received grants from NASA and the National Science Foundation (NSF) for research related to COVID-19.

Gel received more than \$87,000 in grants through NASA's Rapid Response and Novel Research in the Earth Sciences program to study whether surface air temperature, humidity and other weather factors are affecting transmission rates of the novel coronavirus, and if so, how. She is working with collaborators at NASA's Jet Propulsion Laboratory and elsewhere.

Her interdisciplinary team is combining data from several of NASA's Earth-observing satellites with machine-learning algorithms and advanced analyses to track the dynamics of the virus's spread and its mortality rate over space and time.

Part of the goal of the research is to provide a powerful software tool to help predict seasonal COVID-19 progression on a regional to global scale, while quantifying a broad range of associated uncertainties.

Gel also received an \$80,000 grant from the NSF's Rapid Response Research program, which supports nonmedical, nonclinical-care research related to COVID-19, including efforts to model and understand the spread of the disease. Her project aims to use multiple data sources to develop a new deep-learning predictive platform that can be used to forecast future COVID-19 dynamics.

An important aspect of the work is to integrate data like official reports, atmospheric variables and social media into operational biosurveillance and real-time prediction of COVID-19. Gel said the framework will allow policymakers to assess impacts of immediate responses, such as the declaration of a national emergency, a school closing or a quarantine.

"This biosurveillance framework can be used to forecast COVID-19 dynamics and to enhance mitigation strategies," Gel said. "In addition, it could also be applicable for tracking many other infectious diseases, thereby contributing to the security of society as a whole. Furthermore, the project will build innovative connections within and across mathematical biology, statistics and deep learning, with a strong focus on interdisciplinary graduate student research training."

Help for COVID-19 Vaccine Challenges

RESEARCH BY UT Dallas scientists could help solve a major challenge in the deployment of certain COVID-19 vaccines worldwide — the need for the vaccines to be kept at below-freezing temperatures during transport and storage.

In a study published April 13, 2021, in *Nature Communications*, the researchers demonstrated a new, inexpensive technique that generates crystalline exoskeletons around delicate liposomes and other lipid nanoparticles and stabilizes them at room temperature for an extended period — up to two months — in their proof-of-concept experiments.

The Moderna and Pfizer/BioNTech COVID-19 vaccines use lipid nanoparticles — basically spheres of fat molecules — to protect and deliver the messenger RNA that generates a vaccine recipient's immune response to the SARS-CoV-2 virus.

"The expense of keeping these vaccines very cold from the time they're made to the time they're delivered is a challenge that needs to be addressed, especially because many countries don't have sufficient infrastructure to maintain this kind of cold chain," said Dr. Jeremiah Gassensmith, associate professor of chemistry and biochemistry and of bioengineering at UT Dallas and a corresponding author of the study. "Although we did not include in this work the specific lipid nanoparticles used in current COVID-19 vaccines, our findings are a step toward stabilizing a lipid nanoparticle in a way that's never been done before, so far as we know."

Dr. Gabriele Meloni, assistant professor of chemistry and biochemistry in the School of Natural Sciences and Mathematics, is a corresponding co-author of the study.

At room temperature, lipid nanoparticles and liposomes can fuse or aggregate, exposing any embedded cargo to degradation. In their study, the researchers mixed liposomes with a combination of two inexpensive chemicals, zinc acetate

and methylimidazole, in a buffer solution. In about a minute, a crystal matrix began to form around individual liposomes.

"We think that the lipids interact with the zinc just strongly enough to form an initial zinc-methylimidazole structure that then grows around the lipid sphere and completely envelops it, like an exoskeleton," Gassensmith said. "It's analogous to biomineralization, which is how certain animals form shells."

The ability of biomimetic shells to form around biological molecules is not new, Gassensmith said, but the process hasn't worked well with lipids or liposomes. One of the keys to the research came from three graduate students who developed the unique buffer medium that allows the reaction to occur.

Once the biomolecules have grown a shell, they are locked in, and the lipids remain stable. The exoskeleton, however, will dissolve if it encounters something that is attracted to zinc. To release and reconstitute the liposomes, the team added an inexpensive chemical commonly used as a food additive.

In addition to the laboratory experiments, Gassensmith mailed through the U.S. Postal Service a sample of the stabilized lipid particles to his mother in Rhode Island. She shipped them back to Texas, but because the COVID-19 pandemic forced the shutdown of most UT Dallas research labs in 2020, the samples sat untouched for about two months until the campus reopened. Although the informal experiment lasted much longer than they expected, the samples survived and functioned "just fine," Gassensmith said.

The research was funded in part by the National Science Foundation, the National Institutes of Health, The Welch Foundation, the U.S. Army Combat Capabilities Development Command Army Research Laboratory and the UT Dallas Office of Research's Seed Program for Interdisciplinary Research.

RESPONSE

Faculty, staff, students and alumni not only stepped up to address the needs of the UT Dallas community, but they also responded to the COVID-19 crisis by assisting first responders and providing key support for vaccination efforts across North Texas.



Marita Yancey, director of employee benefits and wellness, created mask kits for other volunteers to sew.

Mask Project Keeps Comets Covered

AFTER CAMPUS OPERATIONS essentially shut down in March 2020, many UT Dallas employees continued reporting to campus to maintain essential functions, from housing and dining to police and facilities management.

In response to Centers for Disease Control and Prevention guidelines about wearing a cloth face covering in public settings, as well as the initial shortage of face masks available for purchase, the University community quickly rallied to outfit fellow Comets.

The goal? To provide two reusable, washable face coverings to each employee who regularly reported to campus to perform essential job duties.

Initial requests were received from approximately 400 employees. More than 1,200 cloth face coverings were distributed in April and May 2020.

Debra Greszler, a member of Staff Council and a manager in the Office of Information Technology, volunteered to lead the effort after spending a couple of weekends making cloth face coverings for family members.

“In my 18 years with UTD, this experience will forever be a highlight of being a member

of this wonderful community,” Greszler said. “It truly is the UTD spirit in action, and I am humbled by the volunteers’ giving nature. I have deep gratitude for everyone who has participated in this effort.”

Nearly 100 staff, faculty, students, parents and grandparents of students and employees, UT Dallas alumni, and University retirees joined the effort. Some were learning to sew; others were more experienced. They also donated supplies: fabric, sewing machines, thread, pipe cleaners and elastic.

The UT Dallas Police Department assisted in safely receiving donations, distributing masks, and maintaining the intake and pickup of supplies. Crime prevention officer David Spigelmyer said the project was an opportunity to show the University community that people care.

“When the call goes out, no matter who needs help, our Comet community will always step up and do the right thing,” Spigelmyer said. “Hopefully our students will learn from this example and carry the torch forward when they graduate.”

Keeping Students Connected

WHEN THE UNIVERSITY made the difficult decision to move courses online in March 2020, administrators throughout campus immediately thought of the UT Dallas students who might not have adequate computer access.

“When we make a big move like this, it’s going to inequitably affect students who are in higher-need categories,” said Dr. Jessica C. Murphy, dean of undergraduate education. “So anything the institution can do to even that playing field is important — understanding that we can’t possibly fix all of it.”

Immediately, dozens of University staff and faculty jumped into action, developing a strategy with the primary task of finding computers.

The University considered a number of options, including renting computers; however, the cost and shipping time ruled that out. Office of Information Technology (OIT) staff members next connected with every school and department to help find computers.

Fortuitously, the Eugene McDermott Library had approximately 115 computers that were being prepared to send to surplus. Additional laptop and desktop computers that were at or near the end of their life cycle were offered by the Department of Computer Science in the Erik Jonsson School of Engineering and Computer Science, from OIT and from eLearning services.

At the same time, Murphy and Dr. Amanda Smith, associate vice president for student affairs and dean of students, began the work of identifying students who needed computers for online classes.

Murphy, who is also professor of literary studies and the Mary McDermott Cook Chair for Undergraduate Education, said some students may not own computers, while others might share computers with family members — which would put the device in high demand during the work-from-home period.

OIT staffers worked long hours and on weekends to prepare the desktop and laptop computers to be lent to students. The devices had their hard drives wiped and reimaged, and the units were sanitized. In addition, keyboards, mice and monitors were obtained and sanitized.

Staff in student affairs and OIT said those who received the computers were very grateful, expressing particular appreciation that the University did not take for granted that everyone had the technology needed for online learning.

Murphy said the project is a good example of how UT Dallas cares about its students.

“I don’t know of another university that collaborates so well and focuses on students as much,” she said. “There’s just something kind of special about UTD.”



Valerie Enriquez BA'20



Office of Research staff members Tyler Tornblom (left) and Steve Lucas load PPE.

UTD Donates PPE to Hospitals

AS THE COVID-19 pandemic began threatening North Texas last year, UT Dallas stepped up to help protect front-line medical professionals against the novel coronavirus.

In March 2020, University staff and faculty donated personal protective equipment (PPE) to Parkland Health & Hospital System, which is Dallas County’s public hospital, and the following month made similar contributions of PPE supplies to UT Southwestern Medical Center and Methodist Richardson Medical Center.

The UT Dallas Office of Research spearheaded the collection of supplies from labs as research activities on campus transitioned to a maintenance-only mode of operation. Donations included more than 100,000 gloves, 322 N95 masks and over 1,400 surgical face masks.

Kathan McCallister, assistant vice president for research operations, coordinated the initial response to the first request from Parkland.

“We were working to make sure that our health care workers — doctors, nurses, everyone put in a position to be exposed to contagious patients — were not sacrificing their own well-being as they treated others,” McCallister said. “We remain grateful for the opportunity to serve.”

The COVID-19 pandemic has spotlighted the critical role research universities play in their communities, both in good times and under more challenging conditions, said Dr. Joseph Pancrazio, vice president for research and professor of bioengineering. Pancrazio said that the donation to UT Southwestern, which was unique in its inclusion of coveralls, goggles and bouffant caps, reinforces the close working relationship between the two UT System institutions.

“Under normal circumstances, UT Dallas’ mission of teaching, research and service includes service to the community and the world,” Pancrazio said. “In these extraordinary times, it is imperative that we, as a Tier One research university, stand and lead during a situation that affects our region and beyond.

“It was incumbent upon us to think differently about this, to set an example for our region. In this situation, the supplies that we have must be made available for the greater need.”

Alum Builds Tool To Make Data Accessible

WHEN UT DALLAS alumnus **Dr. Wade Fagen-Ulmschneider BS'05, MS'06** sees graphs, charts and data plots of the coronavirus pandemic spread, he sees questions beyond the lines and dots.

"There is a story there — questions, answers, themes — waiting to be told with the right data visualization tools," said Fagen-Ulmschneider, who earned a bachelor's degree in software engineering and a master's in computer science from the Erik Jonsson School of Engineering and Computer Science. He received his doctorate in computer science from the University of Illinois at Urbana-Champaign, where he's now a teaching associate professor.

Early in the pandemic, Fagen-Ulmschneider created a tool that allows users to find answers in the data and uncover stories of COVID-19 spread and its impact. His 91-DIVOC interactive visualization (COVID-19 read backward, inspired by the UT Dallas Comet mascot named Temoc) of COVID-19 communicates information in such an impactful and accessible way that it's been used by governors of multiple states, featured across popular national news and is updated every day.

"Even though we all wish that coronavirus had

never happened, I feel visualizations about the pandemic are important," he said. "As an educator, I appreciate that my tool can help people nerd out and tell the stories of COVID-19 in an accessible way."

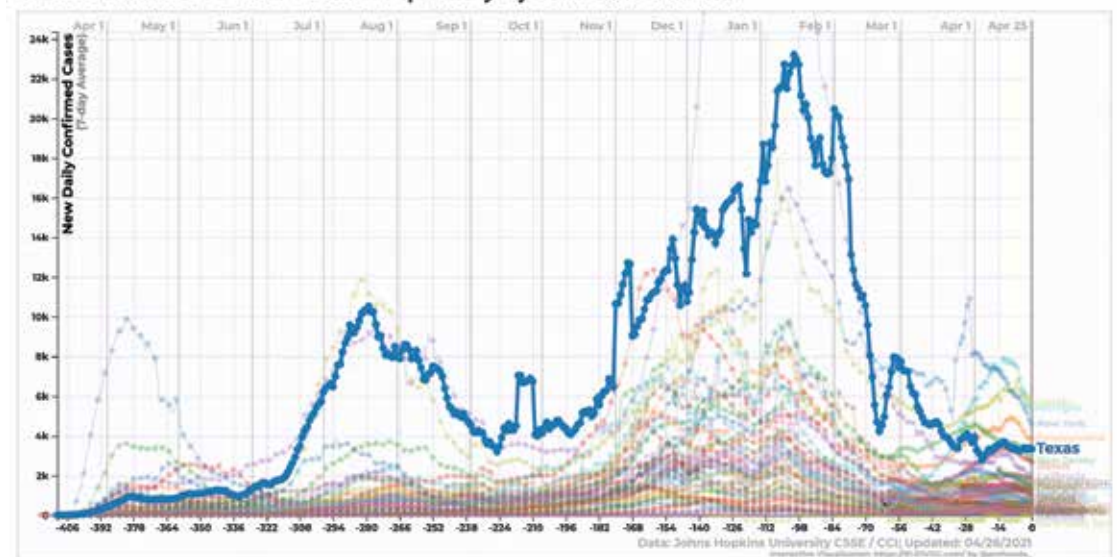
To create 91-DIVOC, Fagen-Ulmschneider started with COVID-19 data collected by Johns Hopkins University, which is high quality, reliable, open access and updated daily. Using this data, he built his own visualization that includes tracking over time of new COVID-19 cases, deaths and hospitalizations by state, territory and country.

He has since added other data sources to his visualization tool, including from the Our World in Data project. Users can now also track vaccines administered.

"Effective visualization of the COVID-19 data to make it more understandable and accessible to both the general public and decision-makers is paramount," said Dr. Murat Kantarcioglu, UT Dallas Ashbel Smith Professor of computer science who is researching privacy issues with COVID-19 patient data. "Wade is one of our great alumni who contributed significant tools to make the COVID-19 data more accessible for the general public."



New Confirmed COVID-19 Cases per Day by States/Territories



\$1M in Funds Donated to Students in Need

THOUSANDS OF SUPPORTERS have provided over \$1 million in vital emergency assistance to more than 2,000 UT Dallas students in need during the COVID-19 pandemic.

When classes moved to online learning in March 2020, most students left campus, leaving many without the resources they relied on for academic success and personal well-being.

These resources included reliable access to the internet and computers capable of participating in online classes; the Student Health Center, which serves as a primary care facility for many students; the Comet Cupboard, which offers food and personal care items; and meals provided by University Dining Services.

To assist students with necessary expenses related to food, housing, technology, child care, medical care and other unplanned needs, UT Dallas created the Student Emergency Fund.

UT Dallas students demonstrated a great need for the emergency assistance: Food insecurity threatened 68% of applicants, and 43% found themselves short on monthly rent. After the transition to virtual learning and distanced instruction, purchasing a reliable computer and covering internet utility costs were the prevailing needs felt by 70% of applicants.

Software engineering graduate Wilfred Labue BS'20 is one student who found help last year through the Student Emergency Fund. Labue previously drove for Uber to pay his bills and cover living expenses, but when he stopped driving to reduce his potential exposure to the virus, he quickly ran out of money.

"One day I saw an email about the fund. The money I got took care of my phone and internet bills and allowed me to have food in my home," Labue said. "It's helped keep me afloat, and I really do appreciate the contributions of our donors."

University partners in the corporate sector also took notice of the need felt by students. State Farm gave \$25,000, the largest single donation for student support.

In the early months of the pandemic, federal and state funding for coronavirus relief provided an immediate source of aid, granting over \$10 million to 7,616 UT Dallas students. This injection of government funding was insufficient, however, to cover all student need, and many UT Dallas students — including the University's significant international student population — were ineligible for these programs.

According to the University's International Student Services Office (ISSO), there were some 300 international students who were in difficult financial straits.

It's those international students that worried Sanjeeb Samanta BS'94, MS'95, a UT Dallas alumnus who traveled from another country for his own education.

Samanta, who is now employed at Texas Instruments Inc., understood their difficulties. He worked with the ISSO and the Office of Development and Alumni Relations to set up the International Student Emergency Fund to support international students during the pandemic.



3D-Printed Ventilator Parts

IN THE EARLY days of the global COVID-19 pandemic, ventilators were considered the most important lifesaving medical device and the last line of defense for treating critically ill patients whose lungs had been devastated by the novel coronavirus. Worldwide, hospitals desperately sought to boost their supply and capacity.

In an effort to be proactive, in March 2020 UT Dallas researchers designed and 3D-printed a critical ventilator part in a campus lab mobilized to address potential supply shortages.

Positive end-expiratory pressure, or PEEP, valves are disposable parts used with ventilators to ensure that patients' lungs retain some air and do not collapse when exhaling. A new valve is needed for each patient.

"We were excited to be able to use 3D-printing technology to manufacture equipment that could save the lives of COVID-19 patients and protect the health care workers caring for them," said Dr. Walter Voit BS'05, MS'06, associate professor of materials science and engineering and of mechanical engineering and one of the faculty members who led the effort. He also is founder and CEO of Adaptive 3D Technologies, a company launched through the UT Dallas Venture Development Center, which supplied the rubber used in the inner component and the outer casing in some of the valves.

The University mobilized the COVID-UT Dallas Response Lab in the UTDesign Studio, which typically is used by engineering students working on senior capstone projects. The studio was closed when the University limited campus access to essential personnel only and moved classes online. The UT Dallas 3D-printing team was one of several university groups across the country operating through 3D Corps, an informal collaboration of experts, to increase the supply of ventilators and protective equipment.

"I'm proud of the students who volunteered to participate in the 3D-printing initiative," said Dr. Stephanie G. Adams, dean of the Erik Jonsson School of Engineering and Computer Science and the Lars Magnus Ericsson Chair. "A college education is about more than what occurs in the classroom, and this project demonstrates the creativity and engineering expertise that our students can contribute to solve real-world problems."

Pedro Rocha MS'20, a biomedical engineering PhD student who helped with 3D designs from home, said, "I volunteered because I saw a problem that I could help solve. I think if you have skills, you have to use them. It's our responsibility as UTD students to provide solutions and help people who are fighting on the front lines."

The researchers worked closely with UT Southwestern Medical Center physicians to determine the most urgent needs. Dr. Hongzhao Ji, assistant professor of otolaryngology-head and neck surgery at UT Southwestern, said that although the hospital had PEEP valves on hand, the 3D-printing project helped ensure that an adequate supply was available if needed.

Terry Scholars Cook Up Way To Help

IN APRIL 2020, at the onset of the pandemic, two UT Dallas students established a nonprofit organization whose mission is to purchase meals from local restaurants and donate and deliver them to hospital personnel in cities most impacted by COVID-19.

Neuroscience senior **Jeannie Nghiem** and healthcare studies graduate **Ramzi Taim BS'21**, who are both Terry Scholars, founded the organization COOKED-19 to help those who are on the front lines of battling the pandemic.

Their efforts have been backed by a grant from RevTech Ventures, a retail technology venture capital firm in Dallas, and a \$1,000 grant from the Victor L. Worsfold Grant Program Fund, which was established by UT Dallas' Eugene McDermott Scholars Program Alumni Association to support student-led service activities providing creative solutions to community problems.

"I know how hard nurses and doctors work, even without a pandemic. These are people who are struggling to get us back to normal and risking their own lives to do so. We wanted to support those who work so hard to support us," Nghiem said.

Taim researched everything needed to set up a nonprofit organization. Then he and Nghiem helped develop partnerships with local restaurants that would provide meals in bulk and recruited volunteers to help deliver the meals.

"It's really been amazing to see so much community support," Taim said.

Since their initial efforts, the duo has added several new members to their team and delivered several hundred masks to front-line hospital workers in addition to meals.

"We are trying to not only provide food for the health care workers working nonstop to fight COVID-19, but also provide some financial help to businesses that have been hurt by the economic downturn," Nghiem said.

Sheila Kelly, director of the Terry Scholars program at UT Dallas, said Nghiem and Taim exemplify the Terry Foundation's vision of giving back to the community.

"Terry Scholars giving back to the community is what Howard and Nancy Terry asked when they began this scholarship 30-plus years ago, and Jeannie and Ramzi have definitely lived up to that," Kelly said.

Since 2006, the Terry Foundation has provided more than \$19 million to the University's 340 scholars, who are selected for scholastic achievement, leadership and service.



Research associate
Luke Joyce with
UT Dallas freezer.

Cold Storage for Vaccines in Hot Demand

IN EARLY 2021, UT Dallas researchers stepped in to assist with a necessary resource for widespread COVID-19 vaccination efforts in North Texas — ultracold freezer storage.

Two of the available vaccines must be stored at temperatures well-below freezing, and as greater numbers of vaccines were being shipped to municipal and regional hubs for distribution, safe storage was critical.

"We participate in regular conference calls with regional emergency management partners," said Mariah Phipps, director of the Office of Emergency Management and Continuity Planning at UT Dallas. "During one of those calls, we mentioned that we might have resources we could make available, and we would be happy to provide support, if needed."

At the same time, members of the Office of Research at UT Dallas began contacting researchers across campus to get an idea of what inventory existed and to determine if any equipment would be appropriate for ultracold storage that met Centers for Disease Control and Prevention guidelines.

Not long after making sure freezers lent by the University would adhere to the CDC guidelines and needs for vaccine storage, UT Dallas was approached by the city of Grand Prairie. As a designated site for vaccination efforts, along with the city of Irving, city officials needed additional storage for the larger volume of vaccines they would be receiving.

Dr. Kelli Palmer, associate professor of biological sciences and Fellow, Cecil H. and Ida Green Chair in Systems Biology Science, volunteered one of her team's new freezers. Once it was cleaned and certified decontaminated, Grand Prairie officials picked it up from campus.

"We are fortunate to count on the support of our stakeholders that allows us to serve our communities in a time of need," said Chase Wheeler, Grand Prairie emergency management coordinator. "It's a testament to the value in building strong relationships before a disaster strikes."

Collin County personnel also asked UT Dallas officials about the possibility of lending a freezer. The Texas Biomedical Device Center at UT Dallas was able to assist.

"The Texas Biomedical Device Center was founded by a U.S. Marine and an Eagle Scout, so service to our community comes naturally. We are happy to have had the opportunity to serve by sharing our equipment during this crisis," said Dr. Michael Kilgard, the Margaret Fonde Jonsson Professor of neuroscience and interim executive director and chief science officer at the center.

Candy Blair, Collin County's public health director, said: "We are so deeply grateful to UT Dallas for lending Collin County Health Care Services an ultracold freezer. The freezer gives our facility the ability to store the lifesaving Pfizer vaccine. The addition of the ultracold freezer also allowed our vaccination planning to expand greatly, which in turn is providing additional help to Collin County residents."

UTSW Hosts Vaccine Clinic at UTD

AS VACCINES FOR COVID-19 became available to the public, UT Southwestern Medical Center opened several community vaccination sites, including one on the UT Dallas campus in March. The site provided vaccinations for both UT Southwestern patients and community members until early July.

"We are grateful to UT Dallas leaders who have generously opened their campus for the benefit of those who still need to be vaccinated," said Dr. Daniel K. Podolsky, president of UT Southwestern and holder of the Philip O'Bryan Montgomery, Jr., M.D. Distinguished Presidential Chair in Academic Administration and the Doris and Bryan Wildenthal Distinguished Chair in Medical Science. "This spirit of collaboration with a sister UT institution is a win for all North Texans."

UT Dallas President Richard C. Benson, the Eugene McDermott Distinguished University Chair of Leadership, said: "We are so fortunate to have partnered with UT Southwestern. Offering our campus as a vaccination site is clearly one of the most important things we could do for the community. Vaccinations provide the best route to normality in Richardson, Dallas-Fort Worth and the entire country."

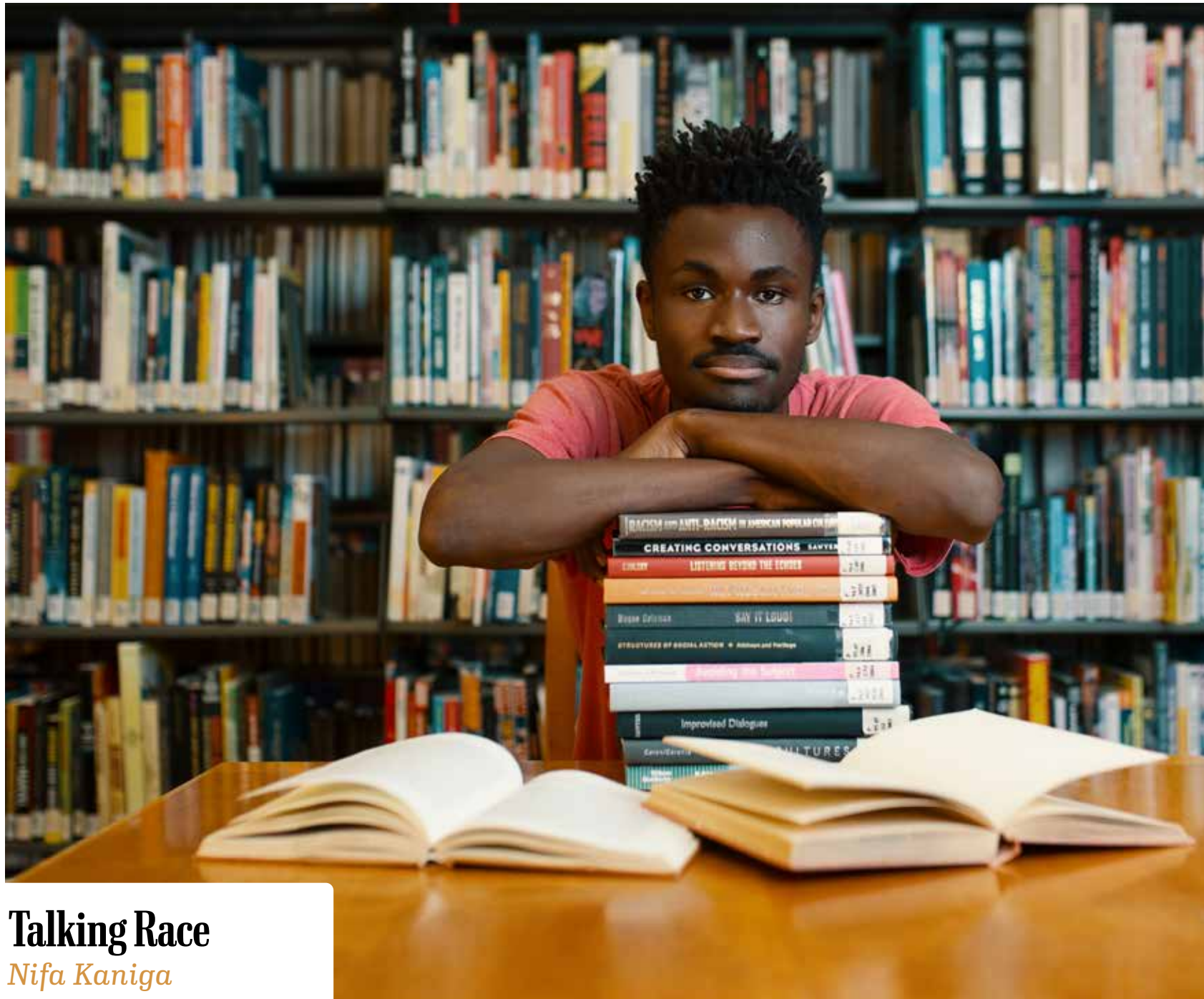
The UT Dallas site was set up at the Davidson-Gundy Alumni Center in the center of campus. UT Southwestern personnel checked people into the clinic and monitored them after they received their vaccinations. UT Dallas provided security and safety support, parking and traffic coordination, and hosts who guided people to the correct stations. More than 1,000 individuals volunteered at the site, where 49,151 doses were administered.

UT Dallas students who are members of the University Emergency Medical Response (UEMR) team were among those administering shots.

Approximately 60 students who are emergency medical technicians or paramedics worked five-hour shifts, providing vaccinations alongside health care workers from UT Southwestern. In addition, UEMR members staffed a medical standby station at the location.

The UEMR team also assisted Collin County Health Care Services with administering approximately 1,500 COVID-19 vaccinations in McKinney, Texas, and helped with proactive COVID-19 testing on the UT Dallas campus.





Talking Race

Nifa Kaniga

A LITERATURE SENIOR at The University of Texas at Dallas who was frustrated by the toxic rhetoric on social media launched a campaign last summer to engage people in face-to-face conversations about race.

Nifa Kaniga took to the streets for a week from noon to sunset in his mostly white and conservative community of Dripping Springs, Texas. He wore a sign that read “Ask Me Anything” and “Make Yourself Uncomfortable.”

The response was “very, very positive,” Kaniga said.

“I was trying to give people an opportunity to

learn rather than stay in the echo chamber that supports only what they believe,” he said. “There’s a lot of misinformation on social media. People hide behind their screens and post nasty comments about Black Lives Matter. And the other side responds with ‘That’s racist,’ or ‘That’s ignorant. Shame on you!’ People are a lot more behaved when you can talk to them in person.”

Kaniga grew up exposed to differences in how people think. He was raised in California, attended middle school in New Jersey and completed high school in Dripping Springs, where his parents still live.

His interest in learning how to engage people and understand different perspectives is one reason he chose UT Dallas and its School of Art and Humanities. When he visited campus, he liked what he saw: a pretty campus, close proximity to a metropolitan area, a diverse student population and plenty of skateboarding – a hobby he’s loved since second grade.

He credits his high school teacher and mentor Travis Crain, who had taught creative writing classes and put him in charge of the school’s literary magazine, for inspiring his career path of becoming a literature teacher.

“Our personalities just synergized. He taught me writing, leadership and how to finish that last year of high school well,” Kaniga said.

His favorite genres are science fiction and fantasy, and he ranks *Fahrenheit 451*, *The Maze Runner* and *The Giver* as among his favorite books. But he also loves classic literary fiction as well.

“I find it fascinating to explore different cultures over time. Literature, for me, is a way to study the human experience – what it is to be human. I find that to be very beautiful. You have to be able to understand how different people think. It’s motivated me to be a teacher even more,” Kaniga said.

He especially wants to encourage young people to close their screens and take up the “lost art” of reading.

“We’ve forgotten how to do that. Social media is easy to digest, and it’s a passive experience. You have to think harder when you’re reading a book,” Kaniga said.

His desire to engage people in critical thinking and more authentic conversation prompted his decision to take to the streets last summer after the death of George Floyd and reaction to mass protests across the country.

“George Floyd was the straw that broke the camel’s back for everybody. I just wanted to do my part,” he said.

No questions were off limits for Kaniga. The

Black Lives Matter movement, in particular, raised questions from those in his community. To encourage conversation, his sign included starter questions like “Why are people angry and rioting?” and “Why is everything about race?”

“It’s a platform to raise awareness of police brutality,” Kaniga explained to neighbors and passersby. “You can’t chastise anyone. It only makes them more ignorant. But after we talk, a lot will end up saying, ‘I never thought of it that way.’”

Kaniga’s unorthodox approach to engaging strangers in conversation around race issues garnered national media attention, as local television reports were carried by CNN. He shrugs off the extra attention.

“It’s been pretty interesting. I’ve seen a very rapid increase in followers on social media — I have about 25,000 on Instagram now. But I’m still me at the end of the day,” Kaniga said.

What was more gratifying was the response from people he met on the street.

“People of different political ideologies and races were coming over and having a discussion with me, and I was hearing them out. Most people are more confused and scared than angry, and this type of conversation pops that bubble they’re living in,” Kaniga said.

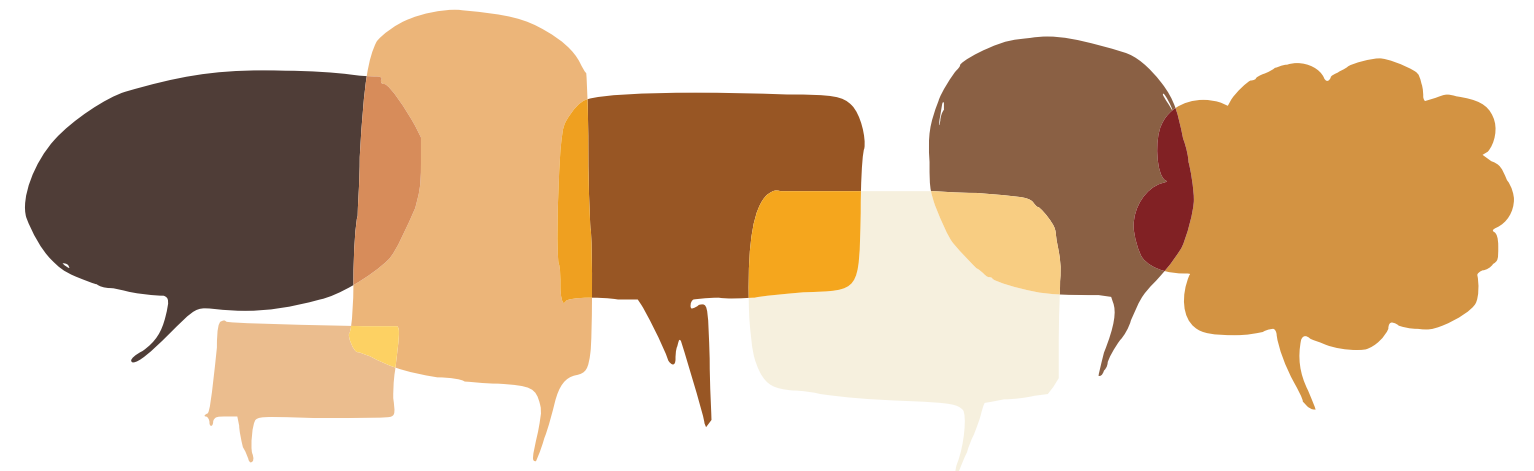
Kaniga said the summertime experience helped him gain skills in de-escalating a conversation around polarizing topics, not mirroring confrontational behavior and not becoming defensive. It also confirmed something he had always believed.

“People respond positively to a good conversation, even if it doesn’t change their mind,” he said. “The way we go about these conversations is more important than the conversation itself. Showing humility and respect is definitely something I will take with me in the future.

“I just want people to have these uncomfortable conversations. If we don’t talk about it, we won’t have empathy for one another, and we won’t move forward together.” —Robin Russell

“I just want people to have these uncomfortable conversations. It we don’t talk about it, we won’t have empathy for one another, and we won’t move forward together.”

— Nifa Kaniga





Forming Bonds

Mónica Rivas

MÓNICA RIVAS FOUND her passion for science through the lens of a beginner's microscope in her childhood home in Bogotá, Colombia.

That gift from her parents allowed her to “examine everything I could get my hands on,” Rivas said – an impulse that set the stage for her research at The University of Texas at Dallas.

Now a chemistry PhD student in the School of Natural Sciences and Mathematics, Rivas said it was her pursuit of a scientific career that brought her to the U.S. – first as a high schooler, then as a college student at the University of Central Florida (UCF), the University of Illinois at Chicago (UIC) and UT Dallas.

At UCF, she was sponsored by a program to include underrepresented minorities in science, technology, engineering and mathematics fields.

That program gave her the opportunity to present her research at the Annual Biomedical Research Conference for Minority Students.

“I befriended like-minded individuals during that transformational experience, which sealed my decision to pursue a career in science, focusing on research and mentoring,” Rivas said. “This decision was grounded in my passion for scientific research, fascination with chemistry and joy in conversation with the eventual mentors and mentees who have been instrumental in guiding my career path.”

With her bachelor's degree in hand, Rivas moved to Chicago, where she met her current mentor, Dr. Vladimir Gevorgyan, who joined the UT Dallas faculty in 2019 as the Robert A. Welch Distinguished Chair in Chemistry.

been fortunate to have an advisor who, aside from being an incredibly supportive mentor, is a world-class scientist who encourages me to become a better chemist every day.”

Scientists in the Gevorgyan lab at UT Dallas are focused on organic methodology research and are seeking new ways to put molecules together for novel purposes – from synthesizing medicines to designing new materials.

“The challenge is to break chemical bonds that do not want to be broken and make new ones using conditions that are less harmful to the environment and mild enough to be applicable to many classes of molecules,” Rivas explained.

Her research efforts earned Rivas the Ruth L. Kirschstein National Research Service Award Individual Predoctoral Fellowship from the National Institutes of Health. The two-year, \$91,000 grant, awarded in 2020, supports her work in developing novel molecules for use in high-precision positron emission tomography, or PET scans. This biomedical imaging technique uses small amounts of a molecule containing a radioactive atom to locate a target protein with precision.

“These radioactive atoms are in high demand, so we're always trying to expand radiochemistry – to find new and more efficient ways to synthesize and diversify them and to give them interchangeable parts,” Rivas said. “Then we can apply them in the early diagnosis of diseases like cancer or neurodegenerative diseases, as well as tracking how treatment is progressing.”

Her project is being carried out in collaboration with UT Southwestern Medical Center and the Advanced Imaging Research Center, a facility shared by scientists at UT Dallas, UT Southwestern and other North Texas institutions.

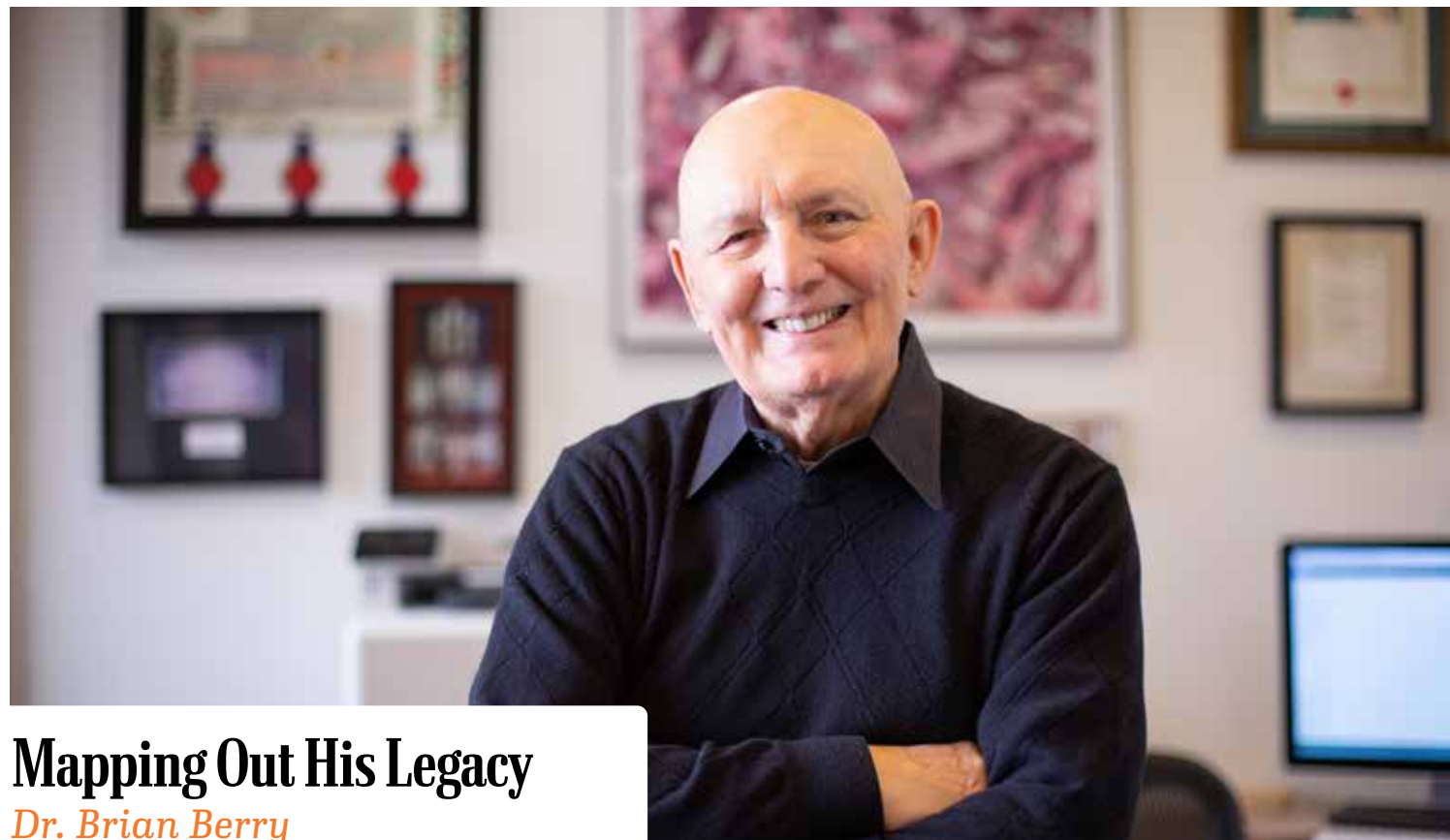
After completing her doctorate, Rivas hopes to find a postdoctoral research position to gain more experience as an independent scientist before seeking a faculty appointment.

“My dream is to be a professor and to continue to pursue the things I'm passionate about – mentorship and teaching alongside research,” she said. –*Stephen Fontenot*

“I have been fortunate to have an advisor who is a world-class scientist who encourages me to become a better chemist every day.”

–*Mónica Rivas*





Mapping Out His Legacy

Dr. Brian Berry

IN A CAREER that has spanned more than 60 years, Dr. Brian Berry has helped change the fields of geography and urban studies by focusing on quantitative analysis and geospatial information sciences (GIS).

At the same time, through his influential research and teaching, he also has built a legacy of excellence and leadership at The University of Texas at Dallas.

In 1986 Berry joined the faculty of the School of Social Sciences – now known as the School of Economic, Political and Policy Sciences (EPPS) – after a lengthy courtship by Dr. Alexander Clark, vice president for academic affairs.

Clark’s mission to lure Berry to the upstart university began in the 1970s. The two had become acquainted while Clark worked with the National Research Council. Berry’s early work helped spark the scientific revolution that occurred in geography and urban research in the early 1960s, making him the world’s most frequently cited geographer for 25 years.

“In the mid-’70s, Alexander followed [UT Dallas co-founder] Cecil Green’s example and traveled around the country looking for new PhDs to staff this new university,” Berry recalled. “He arrived at my doorstep at The University of Chicago. He wanted to talk to some of my new PhDs — he hired

two of them — and then he said, ‘Well, Brian, you’ve decided to leave Chicago after almost 20 years to go to Harvard. I don’t know why you’d want to go to Harvard. Why don’t you come down instead and help me build a new university?’”

While Berry opted for Harvard University, then moved to Carnegie Mellon University, Clark wasn’t deterred, and eventually Berry relented and came to UT Dallas, although he recalled that his first reaction to seeing the handful of Brutalist concrete buildings on the campus was, “What the hell have I gotten myself into?”

At the time, UT Dallas had more graduate students than upper-level undergrads. Freshmen and sophomores would not arrive on campus until 1990. The faculty consisted of about 100 educators. EPPS only had one PhD degree program — public policy. But one thing in favor for UT Dallas — which was only 17 years old at the time — was its youth.

During his 35 years with the University, Berry, who is the Lloyd Viel Berkner Regental Professor, has served as a valued mentor to both students and faculty. He also shifted his research focus to Kondratieff Waves, a theory regarding long economic cycles.

“No other geographer has had more of an impact on the field of geography and social science in

general than Brian Berry,” said Dr. Jennifer Holmes, EPPS dean. “The significance of his scholarship is matched only by the intensity of his work ethic.”

Although Berry once steadfastly opposed serving as dean, he held the post from 2005 to 2010 and helped rebrand the school as EPPS and introduced new PhD programs, such as economics, political science and GIS, which was the first doctoral program of its kind in the U.S.

“I’m very proud of helping create new programs that are among the national elite,” he said, “but I’m also proud of having our PhDs go out and get significant jobs in major universities.”

Berry’s accolades include winning the Vautrin Lud Prize, considered the “Nobel Prize for Geography.” He also was the youngest social scientist to be elected to the National Academy of Sciences. In addition, he received the Victoria Medal, the Royal Geographical Society’s highest honor, and was elected a fellow of the British Academy. Most recently, he received the Kondratieff Medal from the Russian Academy of Sciences, the 2020 Stanley Brunn Award for Creativity in Geography from the American Association of Geographers, and the 2021 University Consortium for Geographic Information Sciences Research Award.

While his list of personal milestones is long, he takes just as much satisfaction in his teaching achievements, including mentoring more than 150 doctoral students during his career.

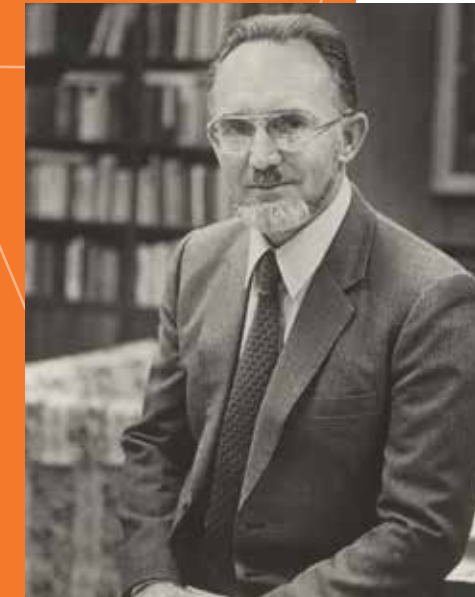
Sunny Uzuh MA’83, PhD’88 was among the first of them at UT Dallas, and he exemplifies the tremendous impact Berry has had on the University’s mission of education.

A native of Nigeria, Uzuh came to the U.S. in 1977 to study. In 1986 Uzuh was mulling whether to pursue a PhD to complement his master’s in political economy when the same name kept appearing in his research.

“Dr. Brian Berry, the famous economic geographer and urban planner — everywhere I read, this man was popping up,” Uzuh recalled. “Around this time is when there was news that he was coming to Dallas. I could not believe it.”

Uzuh earned a doctorate in political economy, with Berry as his advisor. Today, Uzuh and his wife are the founders of the Rosy Health Care Foundation.

“Dr. Berry took me in immediately and encouraged me,” Uzuh said. “It was two years of intensive work, but he treated me as a colleague. It was one of the best decisions I made in my life.”—Paul Bottoni



Breathing Easier

James Griffin, Dr. Peter Baek, Dr. Stacey Boland

IF THERE EVER was a time for ingenuity and teamwork, the COVID-19 pandemic has been it. The stress on health care providers and facilities treating patients has been especially daunting and gut-wrenching. University of Texas at Dallas alumni stepped up to help early in the crisis, using their time and talents to provide solutions during one of the nation's most difficult challenges.



James Griffin BS'18



Dr. Peter Baek MS'15

FROM SNORKEL MASK TO PPE

IN THE EARLY spring of 2020 — and the early days of the pandemic — two UT Dallas alumni designed and manufactured a valve attachment that can convert a snorkel mask into safety gear for health care workers in the event of a shortage of personal protective equipment (PPE).

James Griffin BS'18, CEO and founder of the health care software company Invene, worked with Plano, Texas, anesthesiologist Dr. Peter Baek MS'15 to create the adapter that connects a hospital-grade bacterial and antiviral filter to a full-face snorkel mask. The adapter can be sanitized to use again with a new filter. The masks have to be purchased separately. Similar efforts were carried out across the country.

The pair partnered with the University's UTDesign Studio and Emerson Automation Solutions in McKinney, Texas, to 3D-print the attachment at cost. Each part costs less than \$10 to manufacture.



"Basically, we added a valve to a scuba mask," said Griffin, who earned his computer science degree from the Erik Jonsson School of Engineering and Computer Science. "We're using filters already proven to stop viruses. The resulting mask actually replicates the functionality of an N95 mask. It's free — we just wanted to help doctors."

Griffin and Baek distributed about 300 of the attachments to health care workers in the early months of the pandemic.

After reading about similar solutions used by Italian physicians, Baek, who earned a degree in healthcare leadership and management from the Naveen Jindal School of Management, contacted Griffin. The two had worked together through the University's Venture Development Center, a business incubator that helped Griffin launch his company. Baek has experience mobilizing medical equipment under challenging circumstances. In 2005 he served as medical director of an Air Force expeditionary hospital at Baghdad International Airport.

Griffin, who received an OZY Genius Award in 2018, said he drew upon what he learned about entrepreneurship as a student at UT Dallas to develop, manufacture and distribute the valve rapidly.

"I started looking around to see if there are other ways that we as health care professionals can protect ourselves," Baek said. "I contacted James and said I needed to 3D-print an idea as proof of concept. Let's see what we can do and work together." —Kim Horner

NASA KNOW-HOW LEADS TO VENTILATOR

UT DALLAS ALUMNA Dr. Stacey Boland BS'00 is part of a team of dozens of NASA engineers that in just 37 days developed a new high-pressure ventilator.

The device, called VITAL (Ventilator Intervention Technology Accessible Locally), was developed in spring 2020 at NASA's Jet Propulsion Laboratory (JPL) in California to free up the nation's limited supply of traditional ventilators so they could be used on patients with the most severe COVID-19 symptoms.

The prototype, designed for rapid mass production, was tested at the Icahn School of Medicine at Mount Sinai in New York City and in late April 2020 received Food and Drug Administration approval for emergency use. VITAL can be built faster and maintained more easily than a traditional ventilator, and its flexible design means it also can be modified for use in field hospitals, according to NASA. In late May 2020, eight U.S. manufacturers were chosen to make the device.

Boland, a systems engineer at JPL since 2005, was the operations lead for VITAL. She was responsible for liaising with health care professionals to ensure their needs were met and that they could easily operate the ventilator. She also wrote the instruction manual on the fly.

"On any given day, I'd be talking to doctors, nurses, respiratory therapists, mechanical engineers, electrical engineers, software engineers, project managers, our regulatory team and visual strategists, communicating across and translating between all of these different disciplines to keep us on the same page — all while working remotely," Boland said. "It was an intense and amazing experience."

Boland earned her physics degree from UT Dallas and her Master of Science and PhD in mechanical engineering from the California Institute of Technology. She currently is part of a team developing NASA's Multi-Angle Imager for Aerosols (MAIA) instrument, which will characterize particulate matter in air pollution. —Amanda Siegfried



NASA's VITAL Ventilator



Dr. Stacey Boland BS'00

To read more about UTD's remarkable alumni, visit magazine.utdallas.edu/alumni-notes/.

In Memoriam

Dr. Richard Brettell: Distinguished Professor, Arts Leader

DR. RICHARD BRETTELL, 71, longtime professor of art and aesthetic studies and founding director of the Edith O'Donnell Institute of Art History at UT Dallas, passed away July 24, 2020.

"Rick was a remarkable scholar and educator and one of the leading voices in the world of art," said UT Dallas President Richard C. Benson, who holds the Eugene McDermott Distinguished University Chair of Leadership. "His charismatic lectures have introduced thousands to great art as has his work to build the arts culture in Dallas. No one better epitomized a life well-lived than our brilliant, adventurous friend."

Brettell was one of the world's foremost authorities on impressionism and French painting from 1830 to 1930 and was revered in the Dallas arts community for his leadership, vision and knowledge. Elected to the American Academy of Arts & Sciences and to the board of directors of the Hermitage Museum Foundation, he held the Margaret M. McDermott Distinguished Chair of Art and Aesthetic Studies and the Edith O'Donnell Distinguished University Chair. Before joining UT Dallas in 1998, he was the Eugene McDermott Director at the Dallas Museum of Art and the Searle Curator of European Painting at the Art Institute of Chicago.



Brettell was instrumental in developing the vision for an institute at UT Dallas that would be dedicated to the elevation of preserving and expanding the knowledge of art throughout the world. With a \$17 million gift from arts patron Edith O'Donnell, the art institute was created in 2014.

Under Brettell's leadership, the institute created a partnership with the Dallas Museum of Art, launched major international research partnerships with Nanjing University in China and the Museo e Real Bosco di Capodimonte in Naples, Italy, and collaborated with partner institutions to present symposia, exhibitions and publications. In 2018 the O'Donnell Institute inaugurated a new master's degree program in art history.

In 2017, with a generous gift from philanthropist Margaret McDermott, the University established the Richard Brettell Award in the Arts, a biennial honor recognizing established artists whose body of work demonstrates a lifetime of achievement in their field. *-Phil Roth*

Support for Brettell Creates a New Era for the Arts

FOR MORE THAN 20 years, Dr. Richard Brettell animated UT Dallas with his vision for a community united and enriched through artistic creation, education and appreciation. Following his death, longtime friends and partners came together to spur the realization of Brettell's dreams for the arts at the University.

Nearly 130 individual gifts have raised over \$479,000 for the Rick Brettell

Memorial Fund, which will name a reading room in Brettell's honor in the soon-to-be-constructed UT Dallas Athenaeum.

The Athenaeum project was Brettell's magnum opus in his final years at UT Dallas. Envisioned as an on-campus museum and performing arts complex, the Athenaeum will house world-class collections of art, including several gifted to the University in recent years: the Barrett

Collection, the Trammell and Margaret Crow Museum of Asian Art and the Carolyn Brown photography archives. Boasting classrooms and studios alongside traditional galleries, the Athenaeum will also be a meeting place where students, faculty and community members can collaborate across disciplines and cultures.

-Daniel Steele

Dr. John Hoffman: Stellar Space Scientist

DR. JOHN HOFFMAN, professor emeritus of physics and founding faculty member of UT Dallas, died Feb. 3, 2021. He was 91.

Beginning in the 1960s, Hoffman designed and built scientific instruments for satellites, planetary missions and other space probes for experiments that traveled millions of miles throughout the solar system. His mass spectrometers — instruments that measure the characteristics of atoms and molecules found in atmospheres



and soils — helped explore Halley's comet; accompanied Apollo 15, 16 and 17 astronauts to the moon and the Pioneer mission to Venus; and aided in the discovery of water on Mars.

In 1966 he joined the atmospheric and space sciences research group at the Graduate Research Center of the Southwest, which became UT Dallas in 1969. In addition to teaching, Hoffman was a member of the William B. Hanson Center for Space Sciences, which is part of the Department of Physics in the School of Natural Sciences and Mathematics. He retired in 2017.

"In the early days of space sciences at UT Dallas, John Hoffman built a large number of space experiments for operation at Earth, the moon, Mars, Venus and comets. He provided a foundation for the international reputation in space experimentation

that UT Dallas enjoys today," said Dr. Roderick Heelis, director of the Center for Space Sciences and Distinguished Chair in Natural Sciences and Mathematics.

As a member of NASA's Phoenix Mars Mission in 2008, Hoffman designed a mass spectrometer for the lander that analyzed gases from soil samples on the red planet, which shed light on Mars' atmosphere and climate history. He also designed mass spectrometers that flew on NASA's Atmosphere Explorer C and D satellites.

Hoffman served as head of the Department of Physics from 1978 to 2001. In addition to his teaching and research, Hoffman was very active in science outreach, participating in physics demonstrations and hands-on activities for children and the public on campus, in schools and in the community.

-Amanda Siegfried

"He provided a foundation for the international reputation in space experimentation that UT Dallas enjoys today."

- Dr. Roderick Heelis, director of the Center for Space Sciences

Dr. Louis "Bob" Hunt: Jonsson School Founding Professor

DR. LOUIS "BOB" HUNT, professor emeritus of electrical and computer engineering who conducted research for NASA and helped launch the Erik Jonsson School of Engineering and Computer Science at UT Dallas, passed away Jan. 28, 2021. He was 78.

Hunt was known for his pioneering work in the 1980s that paved the way for dynamic control systems that make operations such as automated flight control possible. Hunt, who retired in 2009, was a beloved instructor who in 2003 received a UT System Chancellor's Council Outstanding Teaching Award. He was also a fellow of the Institute of Electrical and Electronics Engineers (IEEE).

"Dr. Hunt was world renowned for his work in applied mathematics and nonlinear control theory," said Dr. Lawrence J. Overzet, department

head and professor of electrical and computer engineering (ECE). "He actively promoted the growth of ECE and was an extraordinary educator at all levels."

Hunt joined UT Dallas as a mathematics professor in 1984 and two years later helped form the Jonsson School. In addition, he served as department head of mathematical sciences from 1992 to 1994.

After his retirement, Hunt and others formed a company, Cirasys, through the UT Dallas Venture Development Center to develop technology they invented and patented to convert power from sources such as wall plugs or batteries into voltage needed by electronic devices. *-Kim Horner*



Edith O'Donnell: Philanthropist, Arts Patron



Edith and Peter O'Donnell

EDITH O'DONNELL, ONE of Texas' — and UT Dallas' — most generous philanthropists and a strong proponent of education, science and the arts, died Nov. 14, 2020, at the age of 94.

Over the past 60 years, O'Donnell and her husband, Peter O'Donnell, have contributed quietly and substantially to educational and arts establishments in Texas. At UT Dallas in 2013, the Edith O'Donnell Arts and Technology Building was dedicated in her honor. The following year, she made a \$17 million gift to establish the Edith O'Donnell Institute of Art History.

Known for their civic and business leadership, the couple established the O'Donnell Foundation in 1957. That foundation has played an enormous role in advancing education and scientific research. Their contributions over the years to UT Dallas alone total more than \$39 million.

"When UT Dallas honored Edith O'Donnell with the naming of the building, it was a reflection of our gratitude and esteem for her. Her foresight, along with that of her husband, Peter, has transformed the arts, higher education and scientific innovation not only at UT Dallas but also throughout Texas," said UT Dallas President Richard C. Benson, the Eugene McDermott Distinguished University Chair of Leadership.

Dr. Inga Musselman, provost, vice president for academic affairs and the Cecil H. Green Distinguished Chair of Academic Leadership, said, "Mrs. Edith O'Donnell's generous gift that created the Edith O'Donnell Institute of Art History set UT Dallas on a new path of expansion in the arts, complementing the University's strong foundation in science, technology and management."

Dr. Hobson Wildenthal, former provost and current Distinguished Scholar in Residence and professor of physics, said, "The O'Donnells have been committed to the development of UT Dallas'

academic programs throughout the University's history. Their support has been transformative and has contributed greatly to our success as a rising national research institution."

In addition to O'Donnell's signature gift to establish the first art history institute founded in the digital age, the O'Donnells made several multimillion-dollar donations to establish endowments to recruit and retain faculty for the School of Arts, Technology, and Emerging Communication.

For more than five decades, the O'Donnells have supported UT System institutions, including UT Dallas, UT Southwestern Medical Center and Edith O'Donnell's alma mater, UT Austin, from which she earned a bachelor's degree in psychology.

The O'Donnell Foundation primarily supports engineering, science and math education along with arts programs, and has donated more than \$780 million since its founding. Edith O'Donnell's passion for the arts has been evident in her support of the Dallas Museum of Art (DMA) — where she served as chair in 1992 and later as a trustee, the Dallas Opera, Dallas Symphony Orchestra, AT&T Performing Arts Center, Perot Museum of Nature and Science, Meadows School of the Arts at Southern Methodist University and UT Austin's College of Fine Arts. A gift to the DMA in 2013 ensured free general admission and enabled the museum to publish its entire collection online.

-Heidi Harris Cannella

