

Taking the Leap

Warning: looking at this photo may speed up your heart rate. The spectacular shot taken at Brighton Resort is a collaboration between two U alumni—photographer Adam Barker BA'04 and extreme skier Julian Carr BS'04—who met on campus 20 years ago. The duo garnered international attention earlier this year when this photo won gold in the X Games Aspen 2019 Zoom photography competition. Out of the thousands of photos taken together since their college days, this one, Barker says, is hands down his favorite. Carr agrees. "I'll be proud to show this one to my grandchildren someday."





This is the equipment needed to run the LUKE arm. Next step is a wireless option. See p. 28.



WEB EXTRAS

More available at magazine.utah.edu



Watch a video series recapping the history of the Huntsman Center—celebrating 50 years as home to some of the greatest moments in Utah Athletics history.



Be inspired by four masterpieces on temporary display at the Utah Museum of Fine Arts, including three on loan from the Smithsonian.



Hear from alum Tracy McMillan how her humanities degree has helped her in a career in news, TV scriptwriting, book authoring, and hosting her own talk show.



Check out unique artifact photos from the Natural History Museum of Utah's exhibit that celebrated the state's 29 counties. Left, a corrugated

Fremont pitcher found in 1912 near the town of Meadow in Millard County.

FEATURES

22

The Bucket List Alum Jeremy Pugh, author of *100 Things to Do in Salt Lake City Before You Die*, shares his top picks for unforgettable activities all U students should try at least once (yes, The Pie makes the list!)

ON THE COVER

Utah is pretty unique. U students not only have access to world-class professors and facilities but also to diverse arts and culture, city living, the outdoors, and much more. We asked illustrator John S. Dykes to help us capture that spirit of the U and Utah for our cover illustration.

28

A New Hope U researchers join human and machine with the new “Luke Skywalker” prosthetic arm. Not only are amputees able to move the hand with their thoughts, they also experience a sense of touch.



34

Big Data Graduation rates at the U have shot up dramatically, but that's not all. More scholarships and other financial aid, help from advisors, and added supports are making a marked difference in student success. What's driving all the changes? Data—lots of data.

DEPARTMENTS

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**THINGS WITH FEWER
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Traffic Signal

Garrett A. Morgan, 1923

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ERIC HANSON

On the Rise

As the U transforms, so does our magazine



has kept you connected to campus and to fellow alumni. Our new magazine will do the same, but with a name and look that more closely tie to the university.

In addition, *Utah Magazine* (for short) is bigger and better than ever, with captivating features and a refined focus on all that is fueling our momentum—world-class faculty, passionate staff, outstanding students, dedicated donors, and, to be sure, all of you.

Your university is also in the midst of a transformation. The U is on the rise, as measured by virtually every indicator, from graduation rates to research funding

and support from our private and public partners. We are committed to providing unmatched value in higher education and health care while making social, economic, and cultural contributions that improve quality of life.

A perfect example of this is the new LUKE arm being developed by U researchers (p. 28)—a prosthetic that is not only functional but allows users to feel. Another example is the U's centralized focus on using big data more proactively to support students and help them successfully complete their degrees (p. 34).

I hope you'll be as thrilled as I am with *Utah Magazine*. I appreciate the hard work of all involved in envisioning a new magazine that is insightful, celebratory, and representative of the best of the U.

PRESIDENT RUTH WATKINS

P.S. What's on *your* U bucket list? (p. 22)



Utah lacrosse goes Division I

Wow! Go Utes!! I was excited to hear about them stepping into NCAA DI lacrosse ["Crosse Fit," *Continuum*, Spring 2019], and I'm excited for the future. I'll continue to follow and one day perhaps will myself have a Ute playing in this program.

GRANT WOOD, TULSA, OKLAHOMA

Love the U! Love lacrosse! A perfect match. Thanks, Coach Holman, for bringing the right spirit to the program. Go Utes!

BRAD ANDREWS BS'81, KAYSVILLE, UTAH

Great article. I am excited about the Utes' venture, and it's great to see them lead the Pac-12. Hopefully, my grandkids who are now playing the game will get the opportunity to play for the Utes.

TEE MIGLIORI BS'62, LAGUNA NIGUEL, CALIFORNIA



We want to hear from you!

Join the discussion at magazine.utah.edu or email us at magazine@utah.edu. Comments may be edited for length and clarity.

U medical students recruit in rural Utah

I was very impressed with the article on the University of Utah's UROP program to encourage rural students to study medicine ["Rural Roots," *Continuum*, Spring 2019]. Thank you for the U's advocacy.

MICHAEL MCCLEERY BS'71 MBA'73, DISCOVERY BAY, CALIFORNIA

We need more native doctors and nurses in rural communities, meaning the Navajo Nation. I appreciate planting a mustard seed in these youths' minds to become a successful medical professional and to return to their roots with what they will learn.

BESSIE TSO BS'92 MSW'97, CHINLE, ARIZONA



Tips for picking a major

My advice for students is to take as many different classes as you can and remain open to pursuing areas that you find interesting ["Major Decisions," *Continuum*, Spring 2019]. Then, start building a network in that area; talk to the professors, interview professionals, attend conferences. Many people will be willing to offer their time to mentor students. Then plan your courses with the help of counselors and look for summer internships to test your continued interest in the subject. If this is the major for you, great! If not, don't be afraid to start the process again.

CHERYL ANDERSON BA'72, VICTORIA, BRITISH COLUMBIA

Dark skies in northern Utah, too

As spectacular as Utah's rural red rock country is, with the national parks and pristine nighttime skies ["Dark Skies," *Continuum*, Spring 2019], we need to remember there is also ample opportunity for excellent astro-tourism in Northern Utah. Antelope Island State Park is an IDA Dark Sky-designated park with equally stunning views of the Milky Way and the star-studded heavens. You can enjoy the breathtaking views of a dark sky and still be home in time for *The Late Late Show*.

SPENCE KINARD BS'66, SALT LAKE CITY

SOCIAL SPOTLIGHT

On his **Twitter page**, **Luke Skywalker** himself shared the story of a prosthetic hand that allows the user to sense touch. Read more about how the U is developing this technology, on p. 28.



"I never thought I would be able to feel in that hand again- It almost put me to tears" says recipient of LUKE Arm. Same here. I've had a Gibbon named for me, been a Pez dispenser, an electric toothbrush & Underoos-NOTHING is more satisfying than this.



SURVEY SAYS

What's your favorite Nintendo game series?

In honor of alum **Doug Bowser, president at Nintendo of America** (see p. 45), we asked U Twitter followers which Nintendo game series they like best. More than 1,300 folks chimed in, which isn't surprising since 35 percent reported playing up to 10 hours of video games each week.

The Legend of Zelda: **41%**

Super Mario: **23%**

Pokémon: **20%**

Mario Kart: **16%**

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REJOICE
CHEER
DINE
ENERGIZE

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SHOP
LIVE
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News from the U

ROUNDUP



The U launched a Master of Business Creation degree that combines the best of a graduate business degree program and startup accelerator. The nine-month program provides students with the know-how, mentoring, and support they need to launch a company and create their own job.



The U is now part of the Common App, an online platform that lets candidates streamline college applications. They fill out one form and have access to nearly 900 institutions around the world.

A new philosophy of science undergraduate major provides students with a technical grounding in a scientific discipline of their choice; core knowledge in ethical, analytical, and logical reasoning; and highly developed verbal and writing skills.



Just two years old, the U's esports team emerged from a pool of 550 college teams from around the country to take second at the 2019 ESPN Collegiate Esports Championships.

The Black Cultural Center celebrated its grand opening this past September. It will advocate for students, faculty, and staff, as well as serve as a gathering place for them to connect with one another and nurture a shared cultural identity.



Left: The safety of everyone who comes to campus, from students to patients, remains a top priority for the U.

A Safer Campus

The U is investing millions in safety improvements

The U committed this fall to invest more than \$6 million on campus safety initiatives over the next several years, from hiring more security officers for health sciences buildings to installing new security systems in older residential buildings.

Approximately \$1 million will be spent to implement recommendations of the Presidential Task Force on Campus Safety. At the top of its more than two dozen proposals: Hire a chief safety officer to coordinate and oversee safety initiatives on campus. That individual is expected to be in place by spring semester.

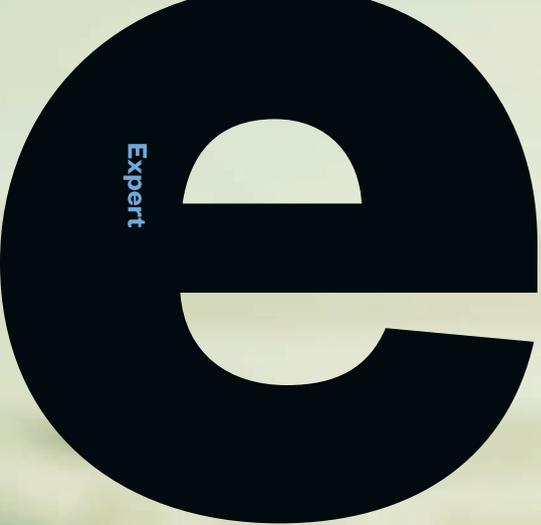
"Safety is a top priority for our campus, and the task force brought forward many good ideas," says President Ruth Watkins. "We are determined to make this institution as safe as it can be."

Other changes made or in progress include giving students access to many parking stalls and lots adjacent to buildings after 3 p.m.; clustering evening classes in six general "neighborhoods" and aligning

these areas with mass transportation, our courtesy escort service, and campus security patrols; and expanding emergency mass communication to alerts mounted on the interior and exterior of buildings. The U also has launched a new initiative to advance research on best practices for preventing violence against women. More than 30 faculty members are already participating in this project.

In response to many student requests, Commuter Services this fall also introduced SafeRide, an on-demand evening shuttle service. Students, faculty, and staff can use the TapRide app on their cell phones to request a ride from and to any campus location between 6 p.m. and 12:30 a.m.

This service complements the existing shuttle bus and courtesy escort services. "I think the program demonstrates to students that meaningful changes are happening on campus," says AnnaMarie Barnes, ASUU student body president.



Baking Tips from an Anesthesiologist

Richard Sperry BA'79 MD'83 MS'94 PhD'95 could share expertise about all kinds of things. He's a professor of anesthesiology; an adjunct in economics, political science, and family and preventive medicine; and he's written two textbooks on neurosurgical anesthesiology. But his expertise doesn't end in the operating room or the classroom. Sperry is an avid baker and has been a member of the Bread Bakers Guild of America for more than a decade. Last year, he even baked at the prestigious Fête du Pain bread festival in Paris.

Sperry got his start baking after returning from religious service in Austria, where he fell in love with the baked goods. "It was just bread; I thought. 'How hard could it be for me to make my own?'" Turns out, it was difficult! But he thinks that after 20 years baking, he's just about able to replicate some of those European loafs. And over the years, as he's honed his craft, he's noted a few tips to help the amateur baker have more success with an oven.

DOCTOR'S ORDERS FOR BETTER BREADS

- 1. No cutting corners.** Read the recipe all the way through before starting. Make sure you have all the ingredients and follow all the directions.
- 2. Don't be afraid of the dark!** Dark crust can add layers of flavor and caramelization.
- 3. Baking takes time.** Anything that's done quickly isn't likely to have good flavor unless it's laden with butter and sugar.
- 4. Refresh a loaf of bread** that begins to feel or taste stale by wrapping it in aluminum foil and baking for 10-15 minutes in a 350-degree oven.
- 5. Keeping bread frozen** extends its life. To thaw, wrap in aluminum foil and bake at 350 degrees for 40 minutes.

 UNIVERSITY OF UTAH
HEALTH CARE

Richard J. Sperry, M.D.
Anesthesiology



Reversing Photosynthesis

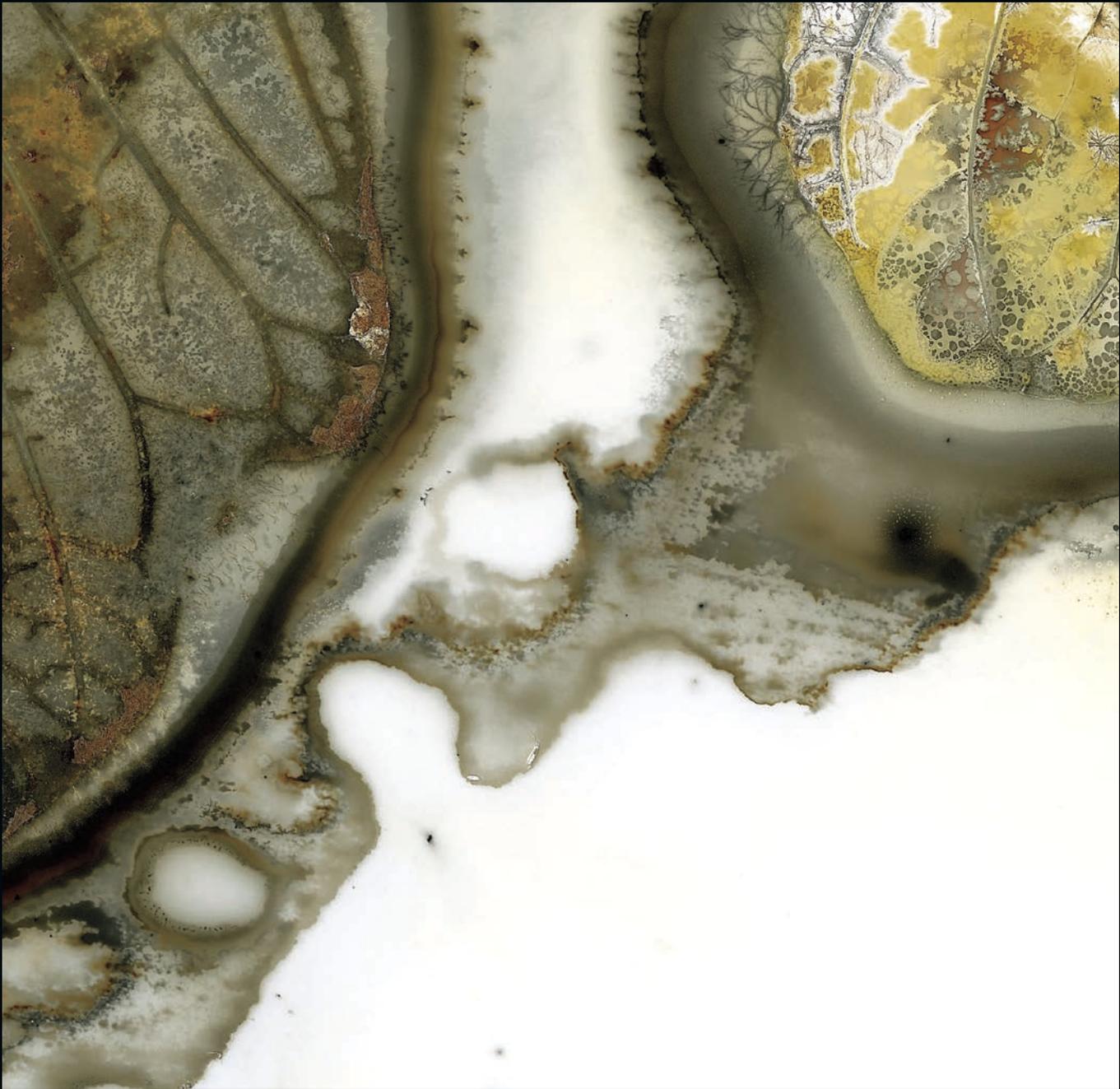
Billions of years ago, ancient bacteria first evolved photosynthesis, a cellular revolution that transformed our planet's atmosphere into one filled with oxygen. Today, plants use photosynthesis to capture sunlight and produce the chemical energy found in the food that fuels every organism on Earth.

In this stunning series of photographs, Edward Bateman MFA'03, associate professor in the Department of Art & Art History, has captured photosynthesis photographically. And he did it without direct interaction with light.

Bateman placed leaves on light-sensitive photographic paper and then left them in total darkness for days or even months to document the change. "Leaves absorb sunlight and convert it to sugars, which they store in their structures," he explains. "Removed from plants and trees, these leaves began a slow process of death." The images formed, he says, as the leaves broke down and leaked their stored light out to expose the paper.

Bateman, whose printmaking and photography work has been shown in more than 25 countries, says this series is a new direction for him, one he says reflects his own aging process and sense of mortality. "For me, this is a shift from the virtual to the tangible as perhaps a way to hang on to the fleeting substance of life."





Asia Campus Turns Five

Thirteen students. That was the size of the first cohort at the University of Utah Asia Campus when it opened five years ago in Incheon, Korea. But the chance to enroll in some of the same courses and earn the same degree as any student on the Salt Lake campus has since attracted hundreds of eager learners. And now more than 330 students—

including 39 from the U.S.—are enrolled in five undergraduate and two graduate programs.

The world is smaller than ever, and the U has an obligation to help students think on a global scale, says Chris Ireland, interim chief global officer. “We’re a pioneer state. That culture of exploration and innovation is woven into who the University of Utah is. And thinking globally is a part of that pioneer spirit.”

Number

다섯



How honest is your neighbor?

If you lose your wallet, how likely is it a stranger will return it? Well, it turns out that may depend on where you live, according to a global study by U management professor David Tannenbaum. For the study published in the journal *Science*, he and his co-authors dropped more than 17,000 wallets in 335 cities across 40 countries. Each wallet contained three business cards and a key. The wallets also contained

either no cash, the equivalent of about \$13, or up to about \$94. People were more likely to return the wallets if there was cash in them, and overall 51 percent of wallets with cash were returned. But that varied widely by location.

The most honest nations? At the top end of the scale, more than 70 percent of the wallets were returned in Switzerland and the Scandinavian countries. Around half of the wallets in the United States were returned. And only about 15 percent of wallet finders came clean in China and Morocco.



Web Extra

See the full country list and return rate at magazine.utah.edu/campusnews



The Healing Power of Melodies

Researchers are leveraging music's powerful effects to treat dementia and pain



Ever get chills listening to a particularly moving piece of music? You can thank the salience network of the brain for that emotional jolt. Surprisingly, this region also remains an island of remembrance that is spared from the ravages of Alzheimer's disease. Researchers at U of U Health are looking to this area of the brain to develop music-based treatments to help alleviate anxiety in patients with dementia and recently published a paper in *The Journal of Prevention of Alzheimer's Disease*.

For three weeks, U researchers helped participants select meaningful music and taught the patient and caregiver how to use a portable media player loaded with the song collection. "Music is like an anchor, grounding the patient back in reality," says Jace King BS'10 MBA'14 PhD'18, now a postdoc at the U and first author of the paper. "When you put headphones on dementia patients and play familiar music, they come alive."

Researchers used an MRI to produce images of the parts of the brain that lit up when patients listened to music, then compared those images to scans taken without music. They found that music activates the brain, causing whole regions to communicate. "People with dementia are confronted by a world that is unfamiliar to them, which causes disorientation and anxiety," says Jeff Anderson, a U radiologist and contributing author on the study. "We believe music will tap into the salience network of the brain that is still relatively functioning."

In another study, U researchers found that music can also be used to help lessen pain. Mice in the study were separated into two groups—the control group was exposed to ambient noise, while the music-intervention group listened to three three-hour segments of Mozart for 21 days. When paired with music, ibuprofen reduced pain responses by 93 percent more compared to the drug alone.

"There is emerging evidence that music interventions can alleviate pain when administered either alone or in combination with other therapies," says Cameron Metcalf BS'01 PharmD'08, a pharmacology researcher at the U.

Eventually, along with traditional painkillers, doctors could suggest apps with music therapies for patients, says U researcher Grzegorz Bulaj. "The holy grail is to combine the right drug with this new paradigm of music exposure, so we do not need as much drug for analgesic effects," says Bulaj.

PICTURE



Web Extra
See all four paintings at magazine.utah.edu/campusnews

Now's the chance to be inspired by four masterpieces on display at the Utah Museum of Fine Arts through October 2020. *La ofrenda*, 1931 (right), by Mexican artist Diego Rivera, is on loan from a new foundation called Art Bridges. And three other paintings by American artists Georgia O'Keeffe, Thomas Moran, and Alma Thomas come from the Smithsonian.



BY THE NUMBERS

#1 

Employer in Utah America's Best Employer by State, *Forbes*, 2019

TOP 50

Public Universities Up 12 spots from last year, ranked 44th best public university in the country, *U.S. News & World Report*, 2019

Up 63 Spots

Jumped from 189th to 126th for **best college in the world**, *Wall Street Journal/Times Higher Education World Rankings*, 2019



#1 **Best College for LGBTQ Students in Utah** *BestColleges and Campus Pride Index*, 2019

#8 

Environmental Law Program *U.S. News & World Report*, 2019

TOP 10 FOR 10

For a decade straight, **U of U Health** has been ranked in the top 10 in the nation for quality, *Vizient*, 2019



DOROTHEA LANGE, 1939 / NYPL DIGITAL ARCHIVES

Boy, oh Boy!

A new study shows fewer males born during hard times

It's a girl! Or at least during times of hardship, more likely than not it will be. Fewer male babies are born in the United States during periods of environmental and ecological stress, according to new research published in *Nature Scientific Reports*. Researchers at the U and East Carolina University analyzed 100,000 births over a 21-year period, from 1918-1939. That time frame includes the Spanish Flu (1918-20), the Roaring '20s (1925-29), and the Great Depression (1932-36). They found that far fewer sons were born during the Spanish Flu and the Great Depression, and more

males were born during the Roaring '20s, with no discernible trend emerging during the other years.

"Quite clearly what we find is that during bad times, we see many fewer boys being born than during the good times," says Ryan Schacht, a researcher from East Carolina University and formerly at the U. "During the Roaring '20s, this is where we are seeing big spikes—117 boys born for every 100 girls." Historically, males have higher mortality rates and in general are more frail than females. Now there is evidence that among humans this frailty extends in utero.

How should higher-ed institutions prepare students for an automated future?



Suresh Venkatasubramanian, professor in the School of Computing

Artificial intelligence and machine learning are changing the way we make decisions. But they're also doing more—changing the very DNA of our society, affecting our laws, our politics, our interactions, and even how we know what we know. What our students need more than ever is a new kind of education that blends humanistic and mechanistic thinking: that helps us understand what it means to be human and live in society in an algorithmically mediated world.



Matthew Sigman, Peter J. Christine S. Stang Presidential Endowed Chair of Chemistry

Everyone should have a basic understanding of computer science and statistics. We have to start thinking about a core curriculum, such as a junior level course on, say, data science and chemistry with general features of the types of algorithms and the types of statistical questions we should be asking. I don't understand all of the mathematics behind it. I don't think you necessarily have to. You have to understand, though, what the algorithms actually are doing.



Arul Mishra, David Eccles Professor of Marketing

Higher-ed institutions need to stop treating AI within the confines of specific departments or schools and start thinking of it as a second language—a language that is now being used to answer questions in areas as diverse as literature and astronomy. If AI becomes a second language, it will not be taught separately but integrated into existing curriculum. This approach will prepare students for a future where more and more tasks across all professions will be performed by AI algorithms.



Dan Reed, senior VP for academic affairs and former corporate VP at Microsoft

Every student, regardless of background, needs to understand how to extract basic insights from sets of data and how to appreciate and assess the validity of common statistical arguments. Put another way, data literacy is now an essential skill, a peer with quantitative reasoning and communication skills. These skills are necessary to appreciate whether learned models and AI yield ethical, valid, and trustworthy predictions and behaviors.



S

Stats

NAME Julia Richter

SPORT Nordic skiing

SKIING SINCE Age 4

HOMETOWN
Sayda, Germany

CLASS Sophomore

MAJOR
International Studies

FAVORITE COURSE
European Politics

LANGUAGES
German, English,
Russian

WORKOUT
When there is snow:
two ski sessions a day
+ weights. No snow:
lots of roller skiing,
running, hiking,
sprinting + weights.

FAVORITE FOOD
Grandpa's *glitscher*
(a German potato
pancake) and anything
grandma bakes

MUSIC Country, which
she fell in love with
watching *Nashville*

HOBBIES
Baking bread, reading
historical fiction

SEASON GOALS
Qualify for the NCAAs
and the U23 World Ski
Championships

CAREER GOALS
Become a professional
skier, get a master's
degree, live in Norway

National Champ

In the final stretch of last year's NCAA Skiing Championship 5-km freestyle race, freshman Julia Richter had one more hill ahead. "It's the last thing you have to do for the day, just get to the finish!" she told herself. Without realizing it, she made up nearly 10 seconds and crossed the finish line to the sound of an ecstatic crowd—winning the NCAA race's individual title and helping the U's ski team win its 12th NCAA championship. "I love training to get better," she says. "But most of all, I really, really love to compete!"

SPORTS BRIEFS



U gymnast MyKayla Skinner is going for Olympic gold. The two-time NCAA title winner is competing for a spot on Team USA for the Tokyo 2020 Summer Games. Don't worry: she plans to be back with the U's Red Rocks for the 2020-21 season.



A new home for soccer and lacrosse opened just in time for the 2019-20 season. The field with seating for 900 in the stands and up to 600 on the grass is west of Wasatch Drive, near the softball stadium.



Ric Mortera is the new head coach for women's tennis. He comes to Salt Lake City after a year as the head coach at Fresno State and three seasons as associate head coach at Texas Tech.



U student Alex Hall, a 2018 Olympian, took home his second X Games gold medal

this year with a win in big air skiing in Oslo. In the Ski Big Air event, athletes drop down a 130-foot-tall slope and perform a series of tricks.



Uswimmer Rahiti De Vos won a gold medal for his native

Tahiti in the 5K open water event at the 2019 Pacific Games.

Gary Henderson joins the U's baseball program as associate head coach. He brings 30 years of experience coaching at the University of Florida, Oregon State University, University of Kentucky, and Mississippi State.



Ugolfer Kyler Dunkle has been named to the Division I PING

All-America team. He finished tied for 28th at the 2019 NCAA championships and was the first Utah golfer to play at the NAAs since 2006.

Utah Athletics inducted gymnast Kristina Baskett BS'09, skier Torin Koos BS'04, distance runner Jeff Simonich BS'00, the 1981 and '82 gymnastics teams, and the 2004 football team into its Hall of Fame on Sept. 27.

A Golden Ticket

New One Pass is nearly all-access to U Athletics events

U sports fans have a new way to catch the action from their favorite teams. The new Utah Athletics One Pass includes general admission access to all home volleyball, soccer, women's basketball, baseball, lacrosse, softball, gymnastics (upper-bowl seating), and men's basketball non-conference games. The One Pass is \$100 for adults and \$25 for youth (12 years and under). The pass is a hard-stock ticket and lanyard for the corresponding events in 2019-20. Purchase your One Pass tickets at utahtickets.com/onepass or call the Utah Ticket Office at (801) 581-8849.

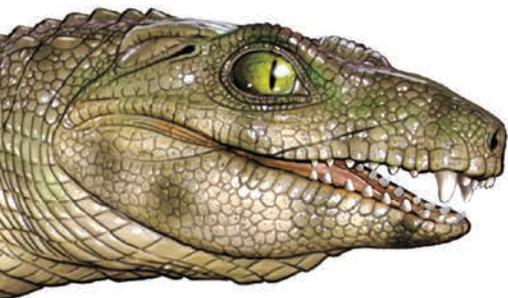
And as a friendly reminder, don't forget the clear bag policy in place for Rice-Eccles Stadium and Huntsman Center events. Fans can bring only one clear bag per person. Go Utes!



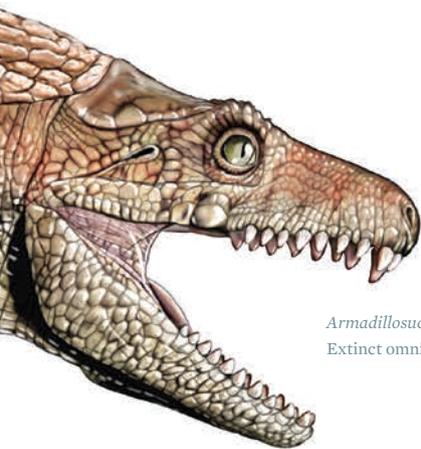
PICTURE



The largest single gift in Utah Athletics history—\$17.5 million from the Ken Garff family—will help fund a renovation and expansion of Rice-Eccles Stadium. The Ken Garff Performance Zone will be erected in the south end zone, adding improvements including new and upgraded seating to increase capacity by more than 5,600 to 51,444. Construction on the \$80 million project began after the last home football game this fall and is scheduled to be completed for the 2021 football season.



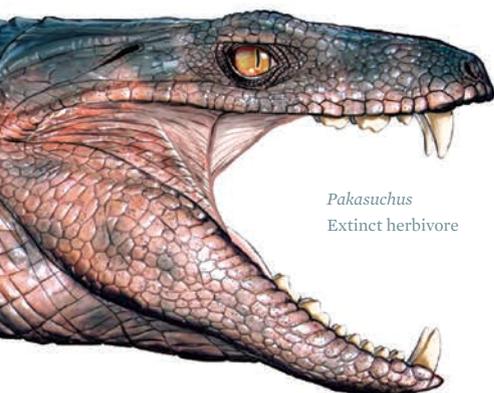
Notosuchus
Extinct carnivore



Armadillosuchus
Extinct omnivore



Chimaerasuchus
Extinct herbivore



Pakasuchus
Extinct herbivore

ILLUSTRATION BY
JORGE GONZALEZ

The Tale is in the Teeth

Research reveals that some crocs of the past were plant eaters

Dinner time for some ancient crocodylians may have involved a lot more flowers and plants than fish and game. Researchers at the U used complex 3-D scans and casts of different extinct crocs from around the world and found that vegetarianism evolved at least three separate times throughout history.

U graduate student Keegan Melstrom and Natural History Museum of Utah chief curator Randall Irmis took highly detailed digital scans of 146 teeth and mapped them like miniature mountains, measuring the complexity of each tooth shape. Studies of modern mammals and reptiles have shown that the more complicated the teeth are, the more plant material the animal eats, Melstrom says, and so the crocodile teeth results were interpreted based upon what we understand about living species.

The researchers' results are published in *Current Biology*. Contrary to the common perception that crocodylians have gone along unchanged since their origin more than 200 million years ago, Melstrom and Irmis found further evidence that crocs of the past were extremely varied and would have looked strange to us. Although there were semi-aquatic ambush predators during the age of dinosaurs (Mesozoic Era), there were also crocodile relatives that lived on land and were more omnivorous in their tastes. There were even some that primarily dined at the prehistoric salad bar. "The most interesting thing we discovered was how frequently it seems extinct crocodylians ate plants," says Melstrom.

These herbivorous crocodile relatives drag out a mystery. What led to the repeated evolution of plant-eating crocs? Though it might be tempting to think that these herbivorous reptiles evolved

in places where plant-eating mammal relatives were absent, the fossil record doesn't bear out that idea. The herbivorous crocodylians lived alongside plant-eating mammal relatives, potentially picking from a similar bill of prehistoric fare. "What this says to me is that you don't need a single special environment for this to happen," Melstrom says. "It's a dietary strategy that's really successful."



Web Extra

See more artifacts from around Utah in the online gallery at magazine.utah.edu/campusnews

PICTURE



The Natural History Museum of Utah treats visitors to a treasure trove representing millions of years of the state and region's natural history. Celebrating its 50th anniversary this year, the museum houses more than 1.6 million objects. Shown above is a tiny Fremont figurine found in Emery County—just one of many pieces that toured the state for two years in the "Traveling Treasures" exhibit to celebrate Utah's 29 counties.

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The BUcket

By Jeremy Pugh

Illustrations by John S. Dykes

College life is about more than just books and all that, yawn, learning. Okay, that's really what it's all about, but the years spent at the University of Utah are also about making memories and friends, and expanding worldviews. We asked local expert and U alum Jeremy Pugh, the author of *100 Things to Do in Salt Lake City Before You Die*, to help us out with a list of must-dos before leaving the U.



1 Sign the wall at The Pie
It's like The Pie has always been there, in its dark brick-walled lair just off campus. It's as much a part of student life as the Union or the library. Join the generations of grads who have spent many late nights blearily chowing down on pizzas and calzones and who have left their mark on the walls layered with student-crafted graffiti. Psst. The Pie has a secret menu item; order the Italian Special to discover it.

2 Watch the sunset from 'The Living Room'
A spider's web of trails spreads across the foothills above campus, a popular area used by trail runners, dog walkers, and mountain bikers. The Living Room hike will take you up to a set of rocks arranged like a sofa and chairs from *The Flintstones*. If you make the hike at sunset, remember headlamps for the walk down.

3 Join a service project with the Bennion Center
Founded in 1987 and named after Lowell Bennion BA'28, the center is the hub for student volunteerism. The monthly Saturday service projects are a great way to meet new friends and learn more about the community. The center also offers longer-term, more involved opportunities to enrich your years at the U.

5 Play flag football on the hallowed turf of Rice-Eccles Stadium
Each spring, The MUSS (Mighty Utah Student Section) plays flag football on the same field where they cheer on the Utes. It's a chance to live out their own football fantasies. And most years, coach Kyle Whittingham is on the sidelines cheering on the game.

4 Go see the Great Salt Lake's Spiral Jetty

American artist Robert Smithson built *Spiral Jetty* in 1970. The giant sculpture on the tip of the Great Salt Lake is what it says it is—a curly rock jetty that goes out into the lake. During wet years it's covered with water, but of late the beautiful stones are bone dry with a salty patina.

List



What are we missing?
Add your ideas to the list at magazine.utah.edu/bucketlist

6 'Feed' the dinosaur at the Natural History Museum of Utah

A favorite of little kids (and kids at heart), the animatronic dino at the museum's entrance collects 25-cent donations and puts on a rip-roaring show as thanks. But the real show is the exhibits that walk you through life in Utah—from rocks on up to the flora and fauna. And then there are the REAL dinosaurs, *lots* of them, and other impressive fossils and skeletal giants from way, way back.

7 Visit the heart of the Marriott Library

Next time you need a study break at the library, skip the nap. Instead, take a walk to the fourth floor and explore the Special Collections. The vast archive of rare books, objects, maps, manuscripts, photographs, and posters that document the region's history are a treasure trove for the curious mind.

8

Have a mindful moment at Red Butte Garden

There isn't a better place on campus to clear the mind than at Red Butte Garden, located above Fort Douglas. It is a carefully preserved open space showcasing the state's exquisite plant life and consists of more than 21 acres of gardens and five miles of hiking trails. Best of all, it's free with a student ID.

9 'Study' at the Union Pool Hall

Yeah, yeah, your chemistry final is tomorrow, but how about a quick game of cutthroat with your study buddies? Just one. Okay, maybe two. Pool is basically physics, so that's a kind of science, right? The pool tables in the Union are a monument to the best kind of procrastination and distraction. One more game?

10 Snag rush tickets at Pioneer Memorial Theatre

Boasting the grande dame of professional stages here in Utah, the Pioneer Theatre Company presents an annual season that ranges from Shakespeare to musicals to challenging works by Chekov. And tickets are cheap. Thirty minutes before curtain, students can get a discount at the box office.



11 Take a lap on the Bonneville Shoreline Trail

This trail traces the former shoreline of prehistoric Lake Bonneville, which once filled the Salt Lake Valley. It's easy to access and offers great views. If you only have time for part of the trek, start at the trailhead near the Jewish Community Center north of campus and ride until you reach City Creek Canyon, then head downtown and catch TRAX back to the U.



12 See a show at Kilby Court

This all-ages venue is an SLC institution. Many bands have passed through on their way up the indie music ladder (Iron & Wine, Death Cab for Cutie, Neon Trees). The small space, hidden down an alley on the west side, is a great place to discover new music.

13 Put meat on your meat

Crown Burger is a beloved local chain featuring chargrilled patties and home to the famous pastrami burger: a quarter-pounder topped with a wad of smoky meat. Meat on meat, if you will. Warning: this mouthwatering burger can create lifelong cravings. Just ask our alumni.

14

Take an Olympic bobsled out for a spin

The one-minute blast down the official bobsled track of the 2002 Winter Olympics in Park City can be described as "one minute of terror." This is a true bucket-list item like skydiving or bungee jumping. Do it. Once. We dare you.

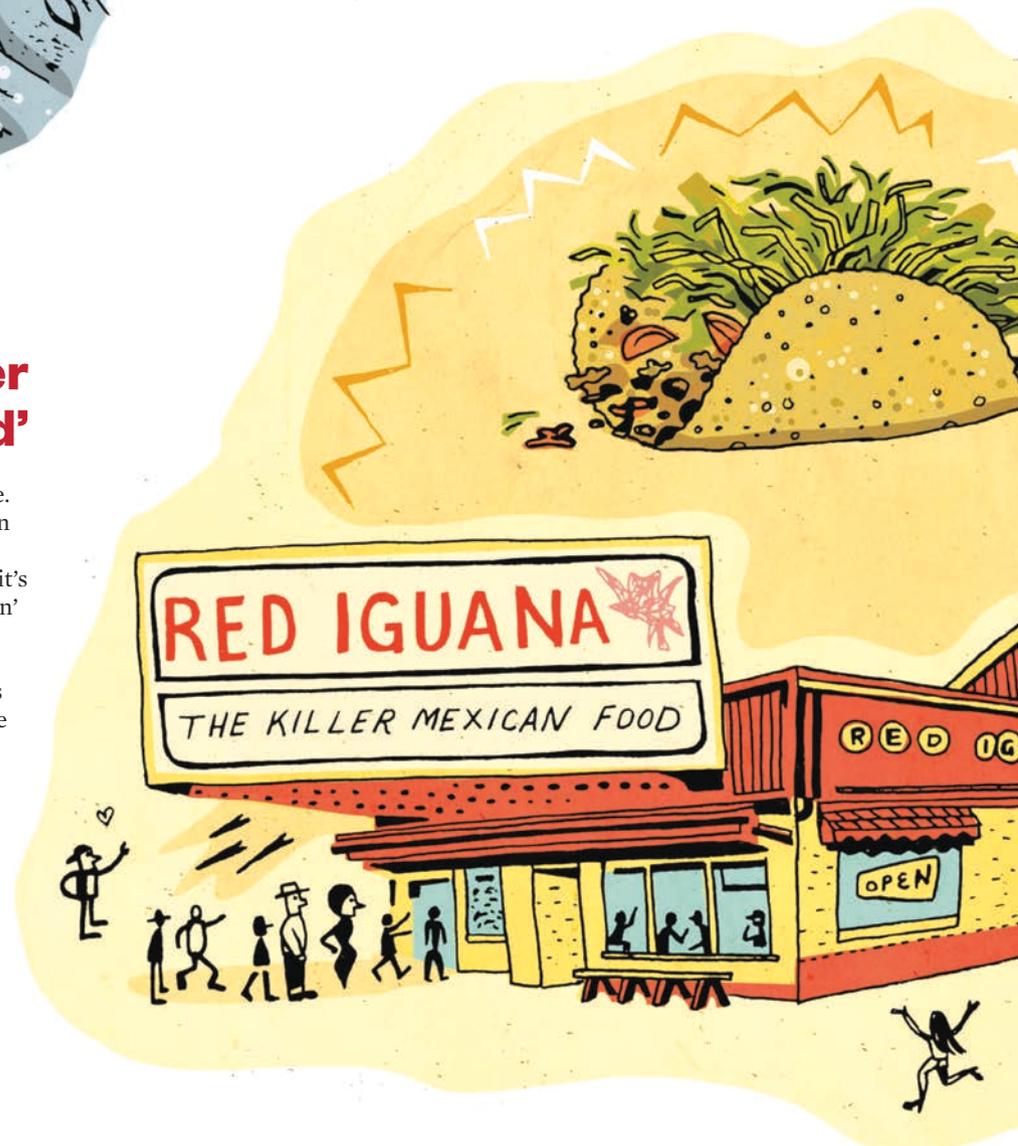
Eat at the home of 'Killer Mexican Food'

Red Iguana lives up to the hype. The hot spot serves up Oaxacan cuisine in a wild environment. Lined with punky bric-a-brac, it's been known as a stop for rock 'n' rollers passing through—Lady Gaga once ordered 90 tacos to go for her crew. And don't miss the selection of moles made the hard way, every day.

15

16 Ski the Greatest Snow on Earth

Salt Lake is the base for six (six!) world-famous ski resorts, all less than 45 minutes from the city. Attending college in Utah and *not* skiing or snowboarding is like living in California and never going to the beach. We've got a skier on our license plates, for heck's sake.



17 **Catch *Rubin and Ed* at the Tower Theater**

At the Tower, you can watch all the foreign films, esoteric documentaries, and period pieces you'd ever want to see. The theater also collects rare DVDs. Do yourself a favor and rent *Rubin and Ed*, an out-of-print movie filmed in Utah in the early 1990s. The oddball buddy flick is about, umm, two guys going to the desert to bury a frozen cat.

18 **Tell your story at The Bee**

Inspired by The Moth in New York City, each night features 10 local storytellers whose names are drawn at random. The stories must be true and be told without notes in under five minutes. Guest judges in the audience score the stories, but the competition is really just a side note to the wonderful amateur storytellers. Be brave and tell your tale.

19 **Stroll through Gilgal Garden**

Gilgal Sculpture Garden was the backyard of Thomas Battersby Child Jr., a businessman and mason who died in 1963. His bizarre folk-art sculptures dot what is now a tiny park nestled in a Salt Lake neighborhood. The themes are often LDS-centric, notably the giant sphinx bearing the likeness of LDS Church founder Joseph Smith. The park is open to the public daily.

21 **See the famous Tabernacle Choir**

There is no sound quite like them—the iconic Tabernacle Choir at Temple Square. You can listen to their stirring vocals Sunday mornings at a live devotional broadcast called *Music and the Spoken Word*. Most of the year, the program is at the historic tabernacle; it moves to the larger Conference Center for summers and around the winter holidays. Tickets are free; brunch downtown after is not.

22 **Spend an afternoon at the ballpark**

A lazy afternoon, the crack of the bat, the quiet murmur of the crowd, and a cold beverage. Salt Lake has one of the best minor league ballparks in America, home of the Salt Lake Bees. And here's a secret: the Sunday day games are pretty well empty (and tickets are cheap). Sit in the sun and relax while the boys of summer chase their major league dreams. **U**

Jeremy Pugh ex'92 is a local freelancer. He recalls his own years on campus as a mix of lectures, study, and a few ditched French classes to play le pinball in the Union.



20

Take a selfie in your grad gown with the Block U

You are planning on graduating, right? Well, when you reach that milestone, make sure you take a portrait in front of the giant red U by the Union. Of course, you can do this without a degree, but it's so much sweeter to savor that moment from the perspective of a newly minted (and *so much* smarter) graduate.



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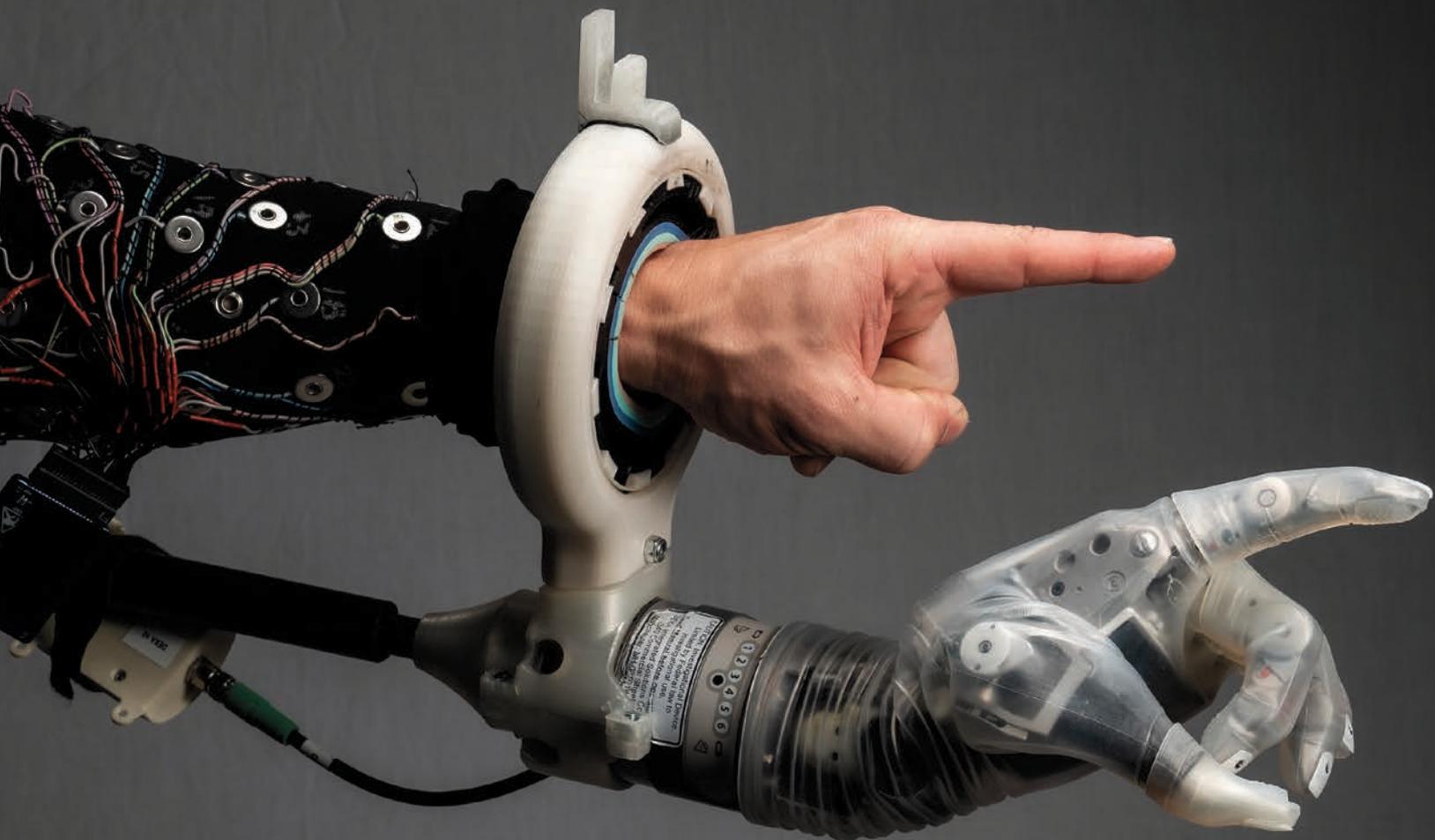
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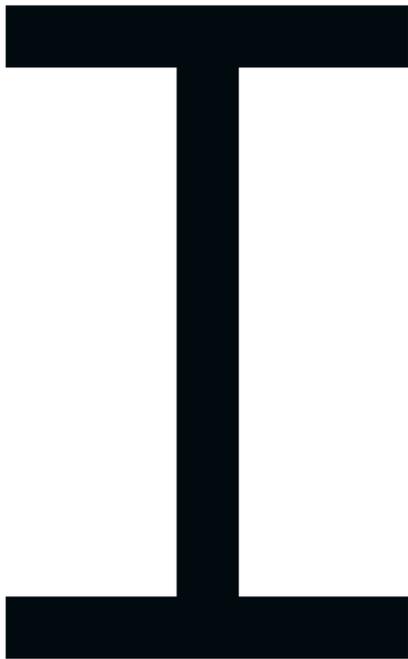
HEALTH
UNIVERSITY OF UTAH



A NEW HOPE

IN A BID TO MAKE UPPER-LIMB AMPUTEES FEEL WHOLE AGAIN, U RESEARCHERS JOIN HUMAN AND MACHINE IN THE NEW 'LUKE SKYWALKER' PROSTHETIC ARM.

BY STEPHEN DARK
PHOTOGRAPHY BY DAVE TITENSOR



In the shadows of his North Salt Lake garage, Matthew Beckstead uses the ends of his arms to cradle the conduit pipe that almost killed him. These aren't stumps, he says. "A stump is the end of a tree. I call them my arms."

He points with his chin to the grooves in the metal. "Here's where my fingers melted into the pipe," he says. Beckstead was just 19 when he lost his arms below the elbow in 1998 while working on a billboard in Ogden. He was holding the conduit pipe he now keeps as a souvenir when an illegal power line sent 27,000 volts through his hands. He fell in flames to the ground, only for the impact to restart his heart.

The double amputee says he had to relearn how to put on his socks, bathe, go to the bathroom, and make food, as well as how to fish, hunt, mow the lawn, and care for his wife and three children. Despite his relentless pursuit of self-sufficiency, the dream of one day getting his hands back, as opposed to using the most up-to-date commercial prosthetics currently languishing in his closet, remained just a dream.

That is until 2016, when he took part in tests led by Gregory Clark, associate professor of biomedical engineering at the University of Utah's College of Engineering. These tests seek to electrically connect the user's remaining arm nerves and muscles to a sophisticated artificial arm called Life Under Kinetic Evolution, or LUKE. Made by DEKA Research & Development Corporation, the arm is named after Luke Skywalker,

who lost a hand in a light saber duel in the Star Wars classic *The Empire Strikes Back*. U emeritus professor of biomedical engineering Richard Normann and colleagues have developed a neural interface called the Utah Slanted Electrode Array (USEA) that functionally joins the volunteer's severed nerve ending to the LUKE arm.

"Our job is to connect the arm to the person so they can move it just by thinking about it," Clark says. And by communicating back a sense of touch and movement, he notes, the limb feels real. In essence, their brain tells them they have their arm back.

The U's multidisciplinary team—drawing on neuroengineers, materials scientists, electrical and computer engineers, surgeons, and rehabilitation specialists—has been pushing the boundaries of the relationship between human and technology under the umbrella of the Department of Defense-funded program Hand Proprioception and Touch Interfaces (HAPTIX), with additional support from the National Science Foundation.

Beckstead was the fourth of seven volunteers, all amputees. After U hand surgeon Douglas "Hutch" Hutchinson implanted two USEAs, each with 100-point electrodes, into Beckstead's nerves,

they're working on, on the screen," he says, with the same passion and pride similarly expressed by the other volunteers who have helped turn the Skywalker arm from prosthesis to dexterous hand.

THE GIFT OF ONESELF

Losing a hand is akin to losing a family member, one volunteer told Clark. "Emotionally, to get back the sense that their hand is actually alive again—which is something we can begin to do—is very, very meaningful to them," Clark says.

"If we can give them some sensation, then they start to feel it's theirs and they'll use it," adds Hutchinson.

With each volunteer, each piece of the puzzle, Clark and his team get ever closer to reuniting people with, in some senses at least, their own hand, although it's far more than that. "I want people to have their sense of self restored, to feel whole again," Clark says.

In 2015, the U received the first part of a \$4.8 million federal grant that funded the most recent round of testing, carrying the neural interface program from virtual reality to volunteers testing a wireless arm both in the lab and on campus grounds.

The involvement of U amputation rehabilitation specialist Christopher

"THEIR BRAIN TELLS THEM THEY HAVE THEIR ARM BACK."

researchers hooked him up to a computer to see if he could manipulate a virtual hand with his mind. While lab technicians busied themselves, Beckstead thought about bending his pinkie, then his thumb, then his finger, only for the screen hand to respond to his thoughts. One of the technicians looked over his shoulder, wide-eyed. "Is that you?"

The resultant hullabaloo among Clark's team made Beckstead marvel at never having seen so many people get so excited in all his life. "I was the first person in the world to control the hand

Duncan focused in part on "taking them from basic science, watching a computerized hand on a screen moving through a range of motions, to real space." He began by printing 3-D open-source hands and implanting sensors that meant volunteers could start to control the prosthetics with their thoughts. These accomplishments were a bridge to the LUKE hand, says Clark.

The team has high hopes for the impact of the HAPTIX program. Duncan recalls how one double-amputee hadn't felt anything with his hands in 20 years.

Opening photo: A U researcher shows the sleeve and bypass socket the team designed to test how the LUKE arm responds to muscle activity.

Right: The LUKE arm gives amputees a sense of touch, allowing them to feel how firmly or softly they are holding an item.





The volunteer had withdrawn from society to a nocturnal life of video games, which he played with his toes. But as he spent more time at the lab, “we saw him blossom,” says Duncan. “He was positively ecstatic he could feel things.”

HOLDING HANDS

As Keven Walgamott talks about the accident that claimed his left hand, he repeatedly massages the end of his arm where the hand was amputated. The Twin Falls, Idaho-born realtor was pulling a submersible pump out of a 20-foot well on his property when an arc of electricity from overhead high voltage lines struck his pole as he raised it. The electricity went in through his left hand, through his body, blew half his left foot off, and knocked him unconscious.

His prosthetist recommended him for Clark’s studies. “I thought it would be helpful if they could improve the prosthesis,” Walgamott says. “I don’t wear one now because it’s so impractical.”

After Hutchinson implanted several arrays of electrodes into the nerves and muscles in his forearm that help control the hand and wrist, Walgamott underwent tests in Clark’s lab. His amputated left arm was hidden on one side of a small barricade, but he was able to control one of Duncan’s 3-D printed hands, which was in front of him.

Once the experiments for the day concluded, Suzanne Wendleken, a student researcher, asked Walgamott if there was anything he’d like to do. “I’d like to clasp my hands together,” he said.

Clark’s ears pricked up. Not clasp the prosthetic—but “my hands.” Walgamott reached out with his intact biological hand and gripped the prosthetic. “I really felt like it was my hand,” he recalls. “For a split second, it was remarkable to be able to clasp hands again.”

In the second half of Walgamott’s 14 months with the lab, the team brought in the LUKE arm and conducted the tests all over again, but this time with the more advanced LUKE arm electrically connected to Walgamott’s motor and sensory systems. He was the first person to try the sensorized LUKE arm this way. “Not only did it move, but I felt things when I touched them, too. I hadn’t felt anything on my hand in 12 years,” he says.

Walgamott turned to his wife, and she took his left hand—his LUKE hand—and shook it. Perhaps more than any other volunteer, he highlighted that “what you do when you love somebody, you touch them,” adds Duncan.

ON THE CHOPPING BLOCK

Perry Pezzarossi’s contribution to HAPTIX began in late August 2017, when his primary doctor in Louisiana referred him to U of U Health to find an answer to the chronic pain in his right hand. For many years, since shattering his wrist in 1993 on active service, he had been forced to live with excruciating pain. He faced one solution, albeit not one he wanted to act on: amputation.

flexion and extension movements of a virtual arm. Ultimately, “Perry was able to accomplish multiple sophisticated activities of daily living both inside and outside the lab.”

Three months post-surgery, Pezzarossi started wearing the LUKE arm, quickly learning he’d have to retrain his brain to use it. “It doesn’t feel like this feels,” he says, holding up his left hand. “I had to learn what the

“I FELT THINGS WHEN I TOUCHED THEM. I HADN’T FELT ANYTHING ON MY HAND IN 12 YEARS.”

Pezzarossi met with Clark, and the researchers connected the LUKE arm to him. His wife handed a ball to the LUKE hand, and Pezzarossi tossed it back to her with his thoughts—even though his biological hand couldn’t move because of his shattered wrist. “That’s it,” he said. “Chop and swap. I’m in.”

Because he lived out of state, U researchers hadn’t been considering Pezzarossi as a possible test subject. In addition, unlike the six previous volunteers who had lost their hands a decade or more before their involvement, Pezzarossi still had to go through the removal of his damaged hand before he could participate. “If I prevent one person going through what I have, then I win,” he says.

Hutchinson amputated Pezzarossi’s right hand to help reduce his chronic pain and make it possible to attach a conventional prosthetic arm. He implanted three electrode arrays in Pezzarossi’s arm nerves and 32 electrodes in his remaining forearm muscles.

Pezzarossi’s long disuse of his broken, twisted hand, its aberrant movements (called dystonia), and arm-muscle atrophy all raised questions for the research team about how soon he would be able to control the arm post-surgery. They needn’t have worried. “He was very successful, right off the bat,” Clark says, controlling up to 16 different

new feeling was going to be. It’s tough, it’s great, but it’s not easy.”

In total, Pezzarossi had implants for a record 17 months, the first of the volunteers to use the LUKE arm beyond the lab’s confines. When he tested the hand under supervision outside the campus lab, he said, “I’m thinking ‘OK, it’s real, it can really happen. I’m proving right now it can be done.’”

While Clark and his team await approval from the U.S. Food and Drug Administration to begin testing a new wireless version of the program that would allow volunteers to take the LUKE arm home, those who’ve helped to bring HAPTIX to this point inevitably wonder what their life would be like if they had their own LUKE arm.

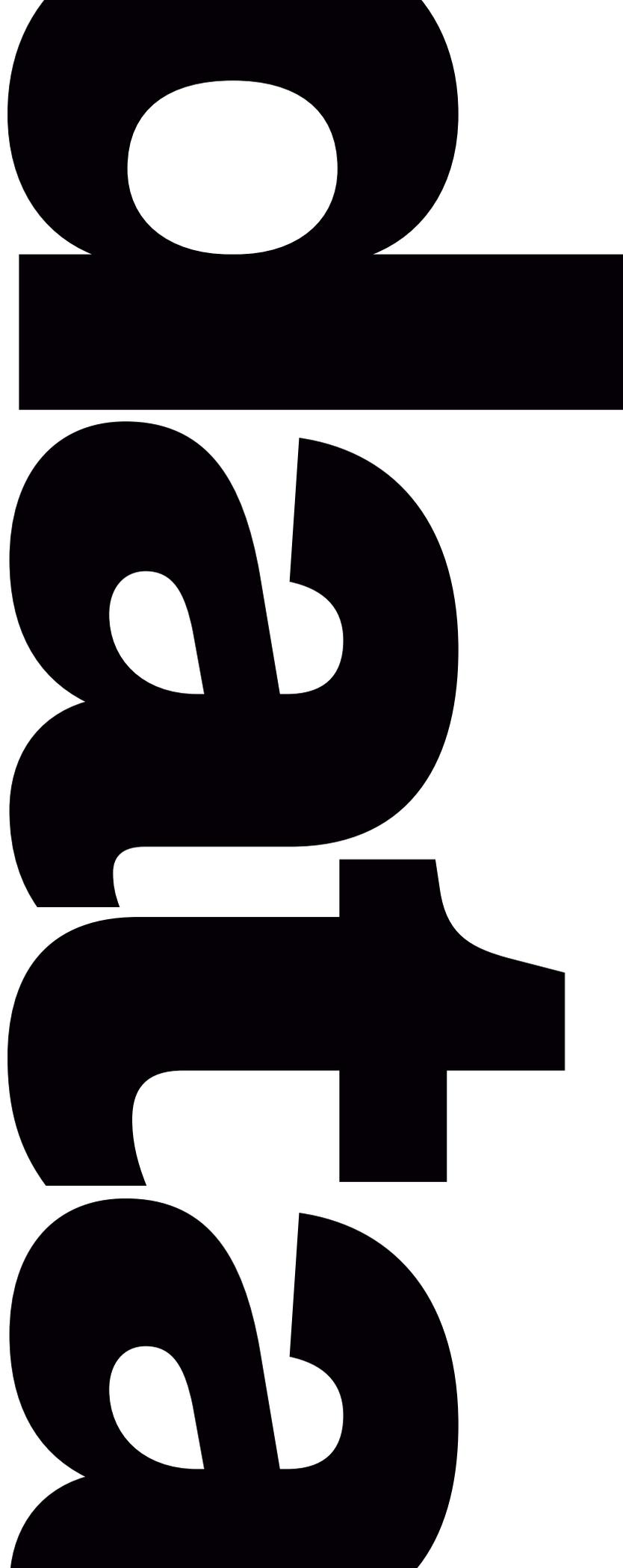
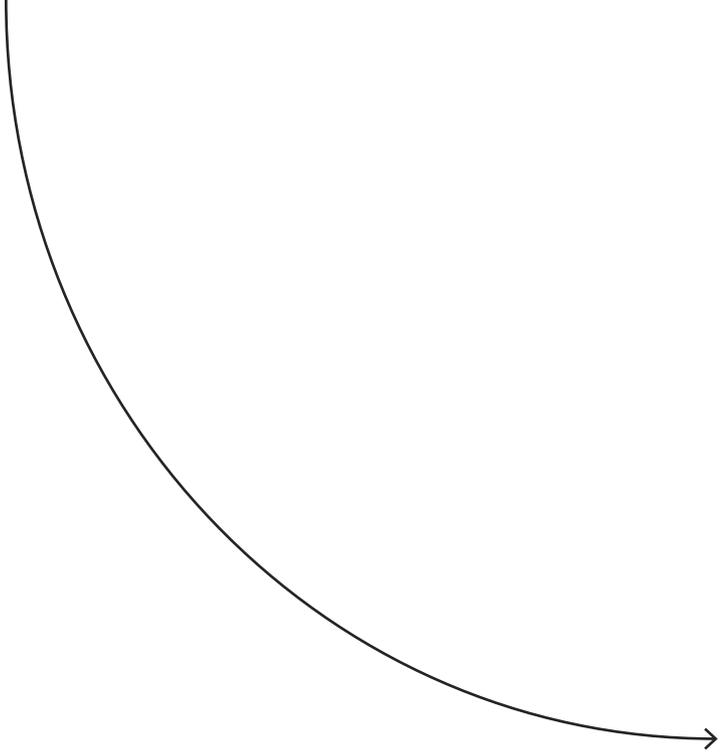
Like many others, Walgamott says he doubted a dexterous prosthetic arm would be accessible in his lifetime and hoped at least future amputees would benefit. But when he got to briefly test the arm in the lab, he did things he hadn’t been able to do for years, such as pulling on a pillowcase and hammering a nail. He marvels, “These things are closer than I ever knew they were.”

Then he expressed something Pezzarossi and Beckstead also wanted passed along. “If they need another volunteer, please contact me again.” **U**

Stephen Dark is a writer for University of Utah Health.

Left: Using motion capture sensors, a U researcher demonstrates how they test dexterity and calibrate a virtual reality arm using movements of an intact hand.

Big



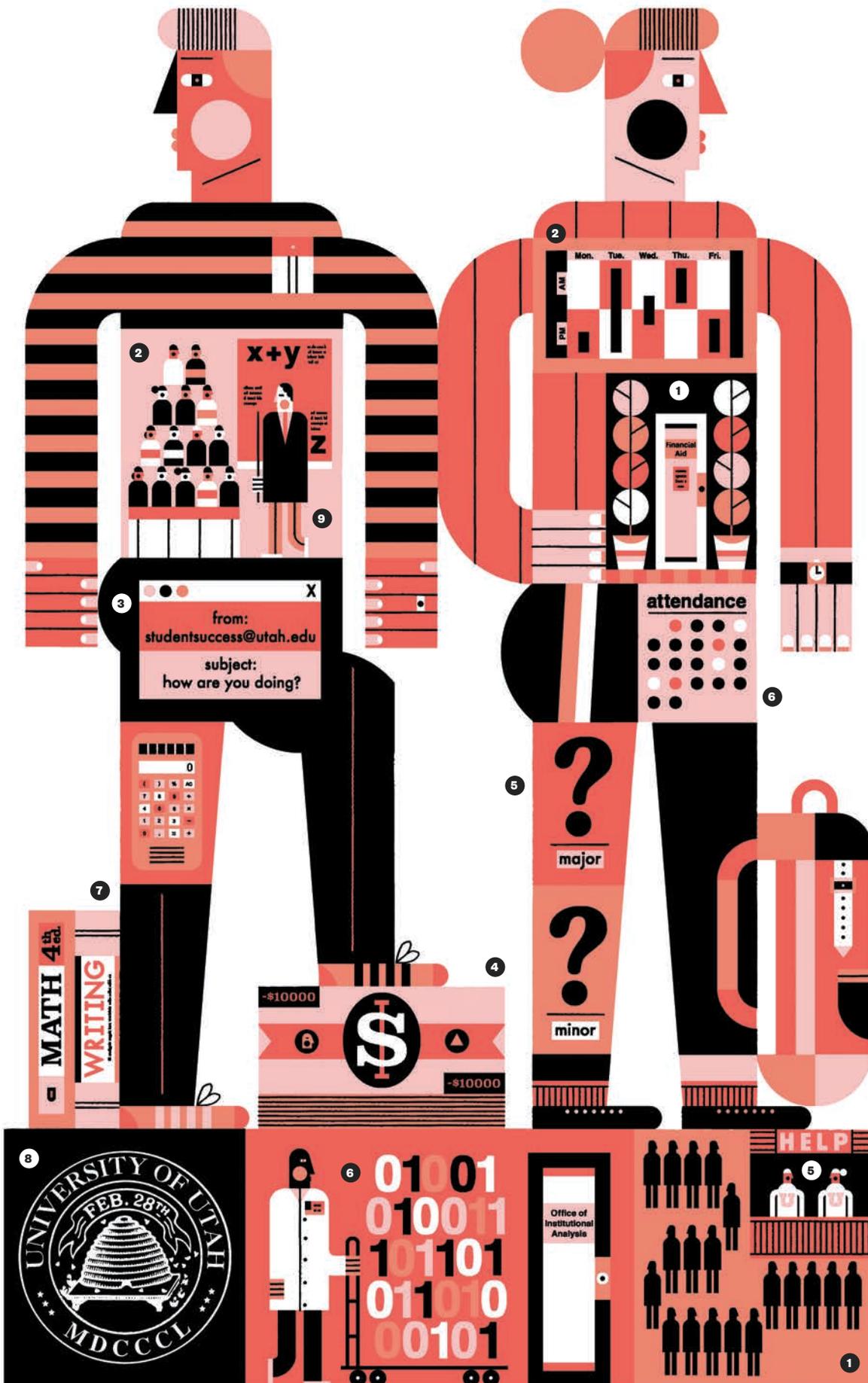
How the U is humanizing analytics to better support students and improve graduation rates.

By Christopher Nelson and Seth Bracken

ILLUSTRATIONS BY RAYMOND BIESINGER

input

DATA-DRIVEN DECISIONS



- 1 No appointment? No problem. Started an **open-door policy** for financial aid counseling.
- 2 Removed **common obstacles** that can delay graduation—not getting into required courses, running out of money, poor planning, etc.
- 3 Formed a **“strike-force team”** to swoop in, meet students where they are, and help connect them to campus resources.
- 4 Launched a one-stop shop for **scholarships**. Gone are the days of hunting around campus and filling out heaps of applications.
- 5 Hired more **academic advisors**—upping the student-to-advisor ratio by 20%. And, the U expanded mandatory advising for all students.
- 6 **S.O.S.** Advisors can now use real-time data to find students who need a helping hand before their grades slip or they drop out.
- 7 No more procrastinating: advisors emphasize **math and writing** for all first-year students. Data shows they’ll have better academic success if they don’t wait.
- 8 Location, location, location! Students who live **on campus** are more likely to graduate quicker. It’s one reason why the U is investing in new housing!
- 9 A home away from home. The U is helping students make **stronger connections** with faculty mentors and find jobs on campus.

DATA SCIENTIST MIKE MARTINEAU doesn't use a crystal ball to predict if a freshman will graduate in six years or less.

His not-so-secret method for foretelling student success? Has the student (1) completed math and writing during first year, (2) met with an academic advisor to identify and declare a major as soon as possible, (3) stayed in school full time, (4) found a "sticking point" on campus (faculty mentor, work study, internship, etc.), and (5) met with a financial aid counselor to come up with a plan to pay for college.

But Martineau BA'08 MS'12 PhD'13 and his team in the Office of Institutional Analysis are doing a lot more than just predicting a student's likelihood to graduate. They're using real-time data to identify students who might need extra support along the way. And this approach has produced some extraordinary results. Most notably, the six-year graduation rate has skyrocketed from 55 percent to 70 percent since 2011. The U is just one of two research universities in the country to see such a jump. "Improvement like this is truly outstanding," says Martineau. "It puts us at the forefront of a national movement."

Opposite Page: Student Success Advocate Christine Contestable and student Oliver Perez. SSAs are front-line advocates who offer personalized support to students.

Below: Data Scientist Mike Martineau leads a team of analysts who dive into big data and help identify students who might need extra support.



Access to college without completion is a hollow promise.

Martineau credits a meeting he had with then-provost Ruth Watkins as one of the driving forces for the change. After reviewing the data his office had been collecting, she challenged them to use it for meaningful and systematic change—to help more students graduate and do it more efficiently. "Her mantra has always been that access to college without completion is a hollow promise," he says.

What followed was a fundamental cultural shift in how the U views big data—from reactive to proactive. Martineau puts it this way: "When it comes to decision making, we've gone from looking in the rearview mirror to seeing out the front windshield."

advising

A NEW APPROACH

It's a daunting challenge. To take vast amounts of data and serve up actionable insights for advisors was a complete shift of perspective, says Martha Bradley BFA'74 PhD'87, dean of undergraduate studies. "We needed a new, more analytics-informed approach to student advising," she says.

First, they identified institutional roadblocks that could slow graduation. For instance, they could see which courses were filling up fastest and creating registration bottlenecks, so they added more of those sections, including online. The data also pointed to the value of academic advisors—who help students not only identify and declare a major and but also chart a personal course to graduation. In response to the data, the U expanded its number of advisors and key advisory milestones: before students register for the first time, before their second semester, and during their sophomore year.

Next, the data helped Martineau's team identify student behaviors that

might indicate a risk for not persisting—using what they call dashboards. Connecting to the university's robust data sets, these dashboards congregate and visualize data to show overall trends, and even drill down to the individual student level. They track more than 200 indicators, such as when students register for classes and how often they log into the online learning system compared to their classmates.

But what makes these dashboards so powerful is their ability to distill hundreds of indicators from tens of thousands of students and serve up the most important and actionable information. "Instead of a one-size-fits-all approach to advising, we can say, 'These are the students who need us right now,'" says Beth Howard, associate dean of the Academic Advising Center. All of this information is a way to start conversations and will never replace human interaction, adds Amy Bergerson PhD'02, associate dean for undergraduate studies. "It's a way to aid responsible human decision making—never a substitute."

nudges

BEFORE IT'S TOO LATE

Timing is of the essence. Rather than reaching out at the end of a semester, when a student may have already failed or dropped out, advisors can now offer support sooner to those who are missing class or whose grades drop dramatically over the course of the class. They do this through email "nudges." Since 2011, a whopping 65,000-plus nudges have been sent to students. "These nudges communicate everything from friendly reminders that it's time to register for the next semester, to direct messages encouraging students to reach out if they need additional support," says Howard.

And when a student needs support beyond academic planning, the U's

Student Success Advocates (SSAs) step in. Think of this team as a “strike force” of front-line advocates for students. They don’t have offices; instead they’re out and about on campus helping connect students with resources such as scholarships and job opportunities, and even during food or housing crises. And the SSAs stay

executive director of the Office of Scholarships and Financial Aid.

“Students’ first concern shouldn’t be how they’re going to pay for school,” she says. “They should be able to focus on coming to school, going to classes, and getting the education and experience they need to go out and be successful after they graduate. And they should



busy. They’ve interacted with upwards of 9,000 students more than 30,000 times.

When Oliver Perez received a nudge from the SSAs his freshman year, he asked for help. The first-generation student studying the philosophy of science says that text changed the course of his education. His advocate, Christine Contestable PhD’10, met with him that very day and listened to his concerns. She walked with him to the financial aid office to meet with a counselor. They still text regularly and meet about once a month. “I didn’t know much about the basics when it comes to college,” says Perez. “I honestly don’t know how I’d do school without her.”

financial aid

SHOW ME THE MONEY

It doesn’t take big data to know that if students run out of tuition money, their degree is at risk—no matter how many nudges they get or when they take math. That’s why the U is expanding its focus and offering additional resources to help students cover the cost of attending school, says Brenda Burke,

have access to a variety of financial aid resources when determining how to cover the cost of college.”

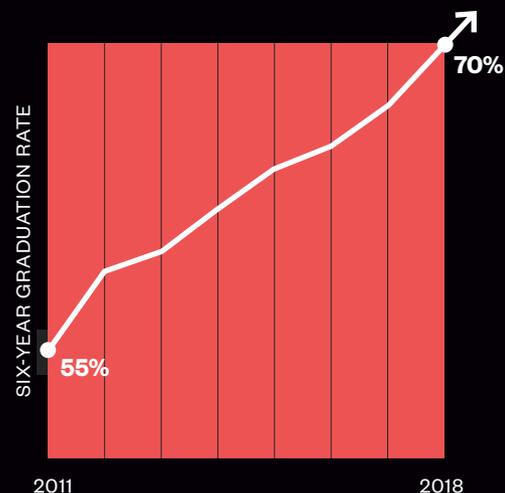
Burke has helped oversee a staggering increase in scholarship and federal funding going directly to students. Much like how the U views big data, these improvements came from changing culture, she says. More outreach was key, which led her office to having a new outreach coordinator, who will coordinate more than 50 financial aid and scholarship workshops around campus and the surrounding community this year alone.

In addition to going out to the community, financial counselors are making themselves more available than ever. Before, students had to make an appointment—sometimes weeks or even months out. But now, the office has an open-door policy, which has made a huge difference. Annual visits to the counselors have increased from 400 to more than 7,000 over the past few years.

One of the first steps to receiving financial aid and need-based scholarships is to fill out the Free Application for Federal Student Aid (FAFSA) form, which provides guidance on what types

GETTING TO GRADUATION

Only two public Research I institutions in the U.S. have increased the graduation rate by at least 19 percentage points in the last decade—and the U is one of them.



WHY SIX YEARS

Why focus so much on graduation rates? Shouldn’t students study as long as they’d like? Well, nationally, one in three students who start college will never get a degree, and more than half don’t finish in six years. And that’s only compounded for lower-income students and those from other underserved populations.

As students stay in school longer, they rack up more debt and lose out on earning potential. Each year a student stays in school can cost \$70,000 in expenses and lost income potential, according to a study by Complete College America.

Martineau points out that the benefit of a degree versus just some college is immense. “A university degree is still the best signaling mechanism to employers that someone can meet deadlines, work collaboratively, complete objectives, and think critically.”

So why is six years the magic number? In 1990, Congress passed the Student Right-to-Know Act that required colleges to disclose six-year graduation rates, which is equal to 150 percent of the normal completion time of a bachelor’s degree. This has become the national reporting benchmark for colleges and universities to compare. And for those wondering about U students who take a two-year sabbatical for religious reasons—that is accounted for in the graduation rate.

of grants, scholarships, loans, and work study options are available to students. The state of Utah has the second-lowest completion rate of the FAFSA form in the nation; just 38 percent of students fill it out, leaving an estimated \$40 million of potential grants on the table. Since the open-door policy went into effect at the U, total FAFSA completion has improved by nearly 30 percent, and total financial aid dollars awarded increased by nearly 20 percent.

But students don't have to physically go to the office to benefit from the improvements. Now, the U has a new

investing

THE FINAL STRETCH

But data shows that easier access to scholarships and other financial aid isn't enough for all students, particularly for juniors and seniors. After federal aid and scholarships come through, many students still struggle to pay for those last few semesters. To compensate, they work more, take fewer credits, and delay graduation. And that's where an income share agreement, a new financial aid option, was born.

In its first year, the Invest in U program lets seniors in selected majors get up to

media, and national groups a week who want to learn more."

Invest in U is a statement of confidence for the U, says Martineau. "It makes us put our money where our mouth is," he says. "We're so sure that if you get a degree from us that you'll be able to get a well-paying job that we're willing to put the money up front."

All these resources are leading to better graduation rates, more financial aid, and less student debt. In fact, fewer than half of undergraduates (40 percent) from the U graduate with any student debt at all. That's the best percentage of any public institution in the state.

goals

WHAT COMES NEXT

Not the types to rest on their laurels, Bradley, Bergerson, Burke, Howard, Martineau, and their teams are already setting an ambitious new goal—to take the six-year graduation rate even higher, up to 84 percent. So how do they keep building on nearly unprecedented growth? They use big data, of course.

For example, they now know that students who live on campus are 12 percent more likely to graduate in six years or less, so more dorms are being built. And to help students find those "sticking points," the U is growing its campus workforce and putting renewed emphasis on internships and work-study programs. And the Invest in U initiative is slated to roll out on a much larger scale. They're also working on getting more data in the hands of faculty. And, while *Utah Magazine* was at press, the U hosted a national College Completion Summit, in partnership with Lumina Foundation, that brought together leaders from public universities around the country to share best practices for increasing college completion rates, showing the U as a leader in using data and innovation to help more students graduate.

It's not just a single lever that makes a difference. Whether it's improving access to financial aid, sending nudges, or hiring more academic advisors, the U is committed to helping students reach their highest potential and get a meaningful return on their investment, says Bradley. "Understanding data helps us develop individualized approaches. It's a guide, not the solution." **U**

Christopher Nelson is the U's communications director. Seth Bracken is the managing editor of University of Utah Magazine.

"These are the students who need us right now."

scholarship database that consolidates most department and college scholarships into one central online location. Instead of searching the web for hours, students can fill out one application, along with interests, background, etc., and they are notified by email when new opportunities open. All these efforts are having an enormous impact. Over the last five years, scholarship dollars awarded at the U have shot up by an astounding 93 percent.

\$10,000. But instead of paying interest as with a traditional loan, students will pay 2.85 percent of their monthly income over a three- to 10-year period, depending on the amount and major, says Courtney McBeth, who oversees the program. And payments will go back into Invest in U, creating a perpetual fund to help future students. "We haven't seen a new financial tool in decades, until now," says McBeth BA'01 MS'05. "We're contacted by at least a dozen other universities,



Right: Student Emery Vigil hands out FAFSA information at a financial aid workshop at the U. More than 50 similar events will be held this year alone.



- 1 Always welcome. Annual visits to the **financial aid office** jumped from 400 to 7,000, and financial aid increased by 20%.
- 2 Smoother sailing. The U added **new sections** of required courses, more online offerings, and inventive ways to pay for school.
- 3 Staying in touch: **Student Success Advocates** have interacted with 9,000 students a total of more than 30,000 times.
- 4 Congratulations! **Scholarship dollars** to students has increased 93% in the last five years.
- 5 I do declare. Four out of five first-year students have **declared a major**, up 12% in the last five years.
- 6 Before it's too late: 65,000+ **data-inspired nudges** sent to students who might need extra support, most before the end of the semester.
- 7 Fewer cases of "math atrophy" as 78% of students now take their **arithmetic requirement** within their first year.
- 8 Vacancies ahead. New **on-campus housing** to open fall 2020 with 990+ new beds, bringing the total to more than 5,000.
- 9 Now hiring! The U is growing its **student workforce**: 24% of undergrads now hold an on-campus job.

Chris Holt is the founder of Campman, an online purveyor of high-quality outdoor gear, and an Eccles School alum.

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DAVE MEKLE

New SLC Alumni Club Unites Wasatch Front

Salt Lake City alums, rejoice!

A new club opened earlier this year for alumni in Salt Lake City and surrounding communities. Take advantage of the opportunity to stay connected with the U, meet fellow alums, network, volunteer, and expand our U community.

“Our club is looking to provide opportunities for Salt Lake-area alumni to connect with one another at networking events, a speaker series, and through community service projects,” says club co-VP Jon Bernal BS’01 MED’14. “We especially want recent U graduates to get involved. This club isn’t just for those who graduated 10, 15, 25 years ago—this club is for everyone.”

Sixteen former Emeritus and Young Alumni board members were selected to serve on the SLC Club Board. Marsha

Apgood MEd’84 and Daniel Young BA’06 JD’09 serve as co-presidents.

The club’s first event was the free game-watch party for the victorious Utah vs. BYU football game this past August. More than 1,000 U fans attended the family-friendly event featuring food trucks, prizes, giveaways, lawn games, music, and a visit from Swoop.

The club has many additional exciting events planned for alums living near the U. If you are a Salt Lake-area alum and are interested in joining the club or assisting with events, visit the Alumni Association’s website at alumni.utah.edu and search for “Salt Lake City” under “Alumni Clubs.” You can also stay up to date with club activities by joining the U’s Alumni-Salt Lake City Facebook group.

Above: The Wasatch Front is home to more than 120,000 U alumni. The new SLC Club aims to connect them through networking, service, and family-friendly events.

ROUNDUP



DC Alumni Club: Wreaths Across America Saturday, Dec. 14, 8 a.m.–noon

DC Club members participate each year on National Wreaths Across America Day by laying evergreen wreaths on veterans’ graves at Arlington National Cemetery. To see other upcoming alumni events, visit alumni.utah.edu.

Alumni Association Scholarship Deadline Friday, February 7, 2020

Next year, the Alumni Association will award more than \$800,000 in scholarships to recognize students’ achievements, involvement, and potential. To see scholarship opportunities, visit alumni.utah.edu/scholarships.



U License Plates U alumni can show pride in their alma mater while contributing to scholarships for deserving U students—helping them complete their education. For more info, visit utahplate.com.

Let’s Get Social! Follow @utahalumni on Twitter, Instagram, and Facebook for the latest on alumni events, news, happenings, and discounts.

ALUMNIFIRE for the U Network with U alums, join U Alumni Communities, post jobs—or look for a new one. Alumni can mentor students or fellow alums. Join at uofu.alumnifire.com.





Picks from 'King Koopa'

Twitter exploded last February when Doug Bowser BS'84 was named the next president at Nintendo of America. For the nongamers out there, it helps to know that he shares his name with the biggest Mario nemesis of all time—Bowser, a spiky-shelled, fire-breathing turtle (aka King Koopa).

Reflecting on his years at the U, Bowser (Doug, not the turtle) says, "I learned so many lessons—some of them tough—but they helped shape who I am today." He chuckles when he recalls being teased for playing too much *Donkey Kong* at the Union. "There were lots of 'Where will video games ever get you?' comments," he says. "Well..."



Video games

My favorite game of all time is *Myst*—a deep, immersive, problem-solving game with very little dialogue. The graphics just amazed me. I finished the first three editions. My favorite game now is *Super Mario Odyssey* for Nintendo Switch. I'm very close to completing it and collecting all the Moons.

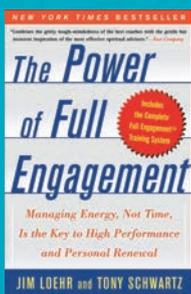


Movie

The Sound of Music. As a young child, I lived in Germany, and my parents would take the family to Switzerland and Austria for vacations. I loved the area. I guess that is one reason I came from New York to Utah for college. I'm also a sucker for Julie Andrews' voice!



This is the other Bowser, the one who kidnaps princesses.



Book

The Power of Full Engagement by Jim Loehr and Tony Schwartz. As an athlete and executive, the concept of an energy management training system intrigued me—and it works.

College sports

I am a huge Utes fan. I follow skiing (12 national championships!), basketball, and football. Although football season in our house is a bit tough: my wife and son are Washington Huskies, and my daughter is an Oregon Duck. Lots of smack talk in the fall!





Writing to Learn

With a U journalism degree in tow, Tracy McMillan BA'89 left Salt Lake for a job at *NBC Nightly News*, followed by 15 years writing and producing TV news. She then transitioned to writing film, books, and television, including the hit show *Mad Men*. Most recently, you'll catch her giving relationship advice to engaged couples as the host of the reality series *Family or Fiancé*. We caught up with McMillan to ask her about her trade.

You've said you'd keep writing even if you won the lottery. Why do you love it so much?

Writing is learning. It's a way of diving deep into the psyche to understand and make sense of the human condition. When you take events, ideas, and emotions and organize them into a story, you are literally structuring *life*. It's like domesticating the chaos of being alive using symbols.

What tips do you have for aspiring writers?

Know what you are here to say. Have a larger narrative for your work. Hint: it's going to be something you really need to work out within yourself. For me, it's relationships. Beginning with my mother giving me up at age three months, and continuing through foster care and multiple marriages, it became clear that my journey is sort of the extreme sports version of what we're all trying to do: find secure attachment in this world. Everything I do in my career touches on this in some way.

How do people react when you tell them you graduated from the University of Utah?

Saying I went to the U of U never fails to start a conversation! People are interested in Utah; they don't know much about it. I always start with my love for Salt Lake City. Then, I boast about how I got a great education with access to wonderful internships for a reasonable price in a safe city with a relatively low cost of living. I talk about the beauty and the nature and the people. And when I'm done with all that, I tell them about fry sauce!



Web Extra

For a video and more Q&As, visit *magazine.utah.edu/asktracy*

Class Notes

'50s



Spence Eccles

Junior Achievement USA honored alum **Spencer F. Eccles** BS'56 with a National Centennial Leadership Award. Eccles—a visionary Utah Man who recently celebrated his 85th birthday—has supported JA for more than 30 years.

Don Gale BA'58 MA'60 PhD'86, former president of the U Alumni Association board and former chair of the U's National Advisory Council, published a memoir, *Magic Moments*.

Kenneth "Larry" DeVries BS'59 PhD'62, emeritus U Distinguished Professor of mechanical engineering, was awarded the Lifetime Achievement Award from the American Society for Engineering Education.

'60s

Everett E. Murdock MS'69 PhD'70 MA'81 published a new book, *The Robots of Cottage H*, a psychological novel that explores three versions of reality created by a young man's troubled mind.

'70s

JJ Perry BA'72 MD'76 released a science fiction novel, *REAP 23*, about a program searching for potentially habitable moons or planets following an Earthwide pandemic.

U School of Computing professor **Robert R. Kessler** BS'74 MS'77 PhD'81 received the IEEE Computer Society Computer Science and Engineering Undergraduate Teaching Award.

Herm Olsen JD'76 was elected to serve as president of the Utah State Bar. Olsen advises clients at Logan-based law firm Hillyard Anderson Olsen.

G. Daniel Ellzey MBA'77 was appointed director of the South Carolina Department of Employment and Workforce by Gov. Henry McMaster.

Don Rabern BS'79 was named dean of the College of Engineering and Applied Science at the University of Colorado, Colorado Springs.

Larry Wall BS'79 was honored by the Utah Sports Hall of Fame for his career in high school athletics. He coached Bountiful High's football team for 31 seasons.

'80s

Jan Morse MA'80 PhD'81 PhD'81 was awarded an honorary doctorate from Francophone University-University Laval in Quebec City, Canada.



Akhlesh Lakhtakia

Penn State professor **Akhlesh Lakhtakia** MS'81 PhD'83 was one of eight honorees who recently received the Alumnus of the Century in Making Award from the Indian Institute of Technology, Varanasi, where he received his undergraduate degree.

Jon W. Tuttle BS'82 published *The Trustus Collection*, a series of six plays he wrote that were performed at the Trustus Theatre in South Carolina over a 14-year period.

David Baker PhD'83 was featured in the *New Yorker* for his recently published book *Swift*, a collection of new and selected poems.

Sally B. McMinimee BS'83 JD'88 was named the Utah State Bar Family Law Section's 2019 Family Law Lawyer of the Year. McMinimee is of counsel at Ray Quinney & Nebeker.

Deborah Dugan JD'84 is the new president and CEO of the Recording Academy, famous for its Grammy Awards. Dugan was most recently CEO of the nonprofit AIDS organization (RED).



Megan Marsden

Megan Marsden BS'84, one of the most iconic names in collegiate gymnastics, has retired from coaching. A remarkable former U gymnast, she had been a member of Utah's gymnastics coaching staff since 1985 and remains an ambassador for Athletics.

John Goldhardt MPA'85 is the new superintendent of New Hampshire's Manchester School District.

Kirk Davies BUS'86 JD'89 was named U.S. District Court clerk for the Middle District of Tennessee.

USA Today best-selling author **Inge-Lise Goss** BS'86 has published a new novel, *Diamonds and Lies*, a thriller about a planned heist that goes awry.

'90s

Scott Wyatt JD'90 was named Cedar City Man of the Year by the city's Chamber of Commerce. Wyatt is Southern Utah University's 16th president.

Myk Watford ex'93 co-stars in the film of DC Vertigo Comics' *The Kitchen*. Watford has a recurring role on the HBO series *True Detective* and also plays in a rockabilly band.

Rohit Verma MS'93 PhD'96 has been appointed the founding provost of Vin University, a newly established nonprofit in Vietnam. Verma was most recently a dean at Cornell and remains on the faculty there.

James Bramble BS'94 JD'97 was hired as general counsel of Washington state-based eXp World Holdings.

Kristen Rogers-Iversen MFA'94 won a Sigurd F. Olson Nature Writing Award for her book *Interwoven: Junipers and the Web of Being*.

University of Nevada, Reno, biology professor **Jennifer Hollander** BS'95 won the 2019 Nevada Regents' Teaching Award.

Matthew Wilson BA'95 BS'95 has been named Missouri Western State University's fifth president. Most recently a professor of law at the University of Akron, he served as its president from 2016-18.

Jason M. Conder BS'96 MPA'02 has been appointed a district court judge for the Ninth Judicial District serving Fremont County, Wyoming.

The Utah State Bar named **Paul C. Burke** JD'97 their 2019 Lawyer of the Year. Burke is a shareholder, director, and general counsel at Ray Quinney & Nebeker.

Matt Daly MA'97 published his first book of poems, *Between Here and Home*, which stitches together a narrative of an imagined rural valley in the American West.

Nevada high school teacher **Kathy Durham** BA'97 was honored with a Jean Ford Democracy Award, which recognizes citizens who have been key in promoting participatory democracy in the state.

Oscar Antillon BS'98 is Moab's new public works director. Previously, he was project manager for the NASA Research Park in California.

Scott Brown BS'98 MAR'00, a founder of DesignCell Architecture, received the U's Alumni Leader Award for his support of U alumni and students in the Las Vegas area. Brown was recognized at a 2019 alumni reception with President Ruth Watkins.

After nearly 15 years as a producer on the long-running KUER talk show *RadioWest*, **Elaine Clark** MA'98 is now managing editor for news at KUER public radio.

Kevin Dyson BS'98, a former wide receiver for the Tennessee Titans and Carolina Panthers, was named principal of Grassland Middle School in Franklin, Tenn.

Tracy Harding BS'98, a teacher from San Ramon Elementary School in Novato, Calif., was selected as a National Endowment for the Humanities Summer Scholar to participate in the institute "Teaching Native American Histories."



Elaine Clark

SPOTLIGHT



Mario Naves BFA'84 helped design a mural for permanent display at 601 Lexington Avenue in New York City. He worked alongside two other teacher-artists and a group of NYC high school students to create the piece. Naves (pictured far right) is also an art critic and the recipient of a National Endowment for the Arts award. He teaches at Pratt Institute, Brooklyn College, and Hofstra University.

Jeff C. Herring BA'98, chief human resources officer at the U, was recognized in *Utah Business*'s 2019 HR Achievement Awards, noting, "Mr. Herring has made big changes at the University of Utah, including adding an option for employees to take paid paternal leave."

Michael J. LaMonte PhD'98, research associate professor at the University at Buffalo, was appointed to the Subcommittee on Physical Activity of the American Heart Association's Council on Lifestyle and Cardiometabolic Health.

Shelby Raebeck PhD'98 recently published *Sparrow Beach*, a novel focused on preserving eastern Long Island against the tide of development.

James Shill MBA'98 is the new CEO of Heritage Medical Associates, one of Nashville's biggest physician groups.

Anthony Godfrey MEd'99 EdD'07 is the 12th superintendent of Utah's Jordan School District.

Salt Lake City School District teacher **Jenny Nicholas** HBA'99 has been appointed to the board of the National Council for History Education.

'00s

Justin del Rosario BA'00 is founder and executive director of Gay Hockey DC, an inclusive gay-straight hockey team in Washington, D.C., aiming to promote skills and sportsmanship while fighting homophobia.

Arie Sithichai Mobley BS'00 PhD'07 published a new book for undergraduates, *Neural Stem Cells and Adult Neurogenesis*.

Tracy Sjostrom MEd'00 is the new principal for Mary W. Jackson Elementary in Salt Lake City.

Jon Lindberg BS'02, of Utah's Lehi Junior High, received a 2019 Excellence in Teaching Award from the Utah Edu-

cation Association, as well as the Huntsman Education Award for a Teacher in Special Education, which comes with a \$10,000 prize.



Rosemarie Hunter

Rosemarie Hunter PhD'04 is the new dean of the School of Leadership Studies at Gonzaga University. Hunter is a former associate professor, special assistant to the

president, and director of University Neighborhood Partners at the U.

Margot Singer PhD'05 authored *Underground Fugue*, a novel shortlisted for the Sami Rohr Prize for Jewish Literature.

Abigail Hunter BS'06, of Los Alamos National Laboratory's Computational Physics Division, received the Presidential Early Career Award for Scientists and Engineers.

Nubia Peña BA'06 JD'16 won the National Juvenile Justice Network's 2019 Youth Justice Emerging Leader Award. Formerly with Utah Juvenile Defender Attorneys, she is now director of the Utah Office of Multicultural Affairs and the training specialist for the Utah Coalition Against Sexual Assault.

Neelam Chand BS'08 has been named senior vice president for diversity and inclusion for Zions Bank.

Valerie D'Astous BS'09 MS'11 MS'12 was awarded a grant from Utah State's Center for Persons with Disabilities. Her autism employment training program will be funded \$100,000 per year for three years.

Lianna Kinard BS'09 is the 2019 recipient of the Rising Star Award, given to an outstanding David Eccles School of Business alum under 40. Kinard is vice president of marketing for Buckner Company.

SPOTLIGHT

The documentary *Quiet Heroes*—created by **Jenny Mackenzie** PhD'99, **Amanda Stoddard** BA'01 MFA'15, and **Jared Ruga** JD'16 MBA'16 MA'16—won a Daytime Emmy Award. The film explores how U physicians **Kristen Ries** and **Maggie Snyder** MS'91 partnered with an order of Catholic nuns to create a safe haven for patients in Utah during the height of the HIV/AIDS crisis.

Richard Medina PhD'09, professor of geography at the U, and U researcher **Emily Nicolosi** collaborated with the DIGIT Lab to develop a unique app for reporting incidents of hate.

USANA Health Services appointed **Brent Neidig** BS'09 MBA'13 chief officer and managing director of the company's presence in China.

'10s

Two U academic advisors claimed top spots at the National Academic Advising Association 2019 Global Awards. **Tracey Farnsworth** BS'13 MPA'17 received the Outstanding Advisor, Primary Category award. And **Elizabeth Perez** BA'07 BA'08 MEd'11 received the Outstanding New Advisor, Primary Role award.

Katarina Felsted MS'10 PhD'18 received the Rising Star Early Career Faculty Award from the Gerontological Society of America, recognizing teaching and/or leadership that stands out as impactful and innovative.



Rob Lea and Caroline Gleich

Professional adventurer **Caroline Gleich** BS'10 and her then-fiancé, Rob Lea, summited Mount Everest together in May. The two were married in Salt Lake's Little Cottonwood Canyon in August.

Lei Talamaivao BS'11 is the new football defensive line coach at Idaho State. Talamaivao played defensive line for the Utes from 2007–11 and spent the last two seasons as a graduate assistant and quality control coach at the U.

Dr. John Langell MBA'13 is the new president of Northeast Ohio Medical University. The longtime surgeon, educator, and researcher was founder and executive director of the U's Center for Medical Innovation.

Macy Lewis BA'13 published her first novel, *Fevered Hearts*, a romance-thriller set amidst the 2014-15 Ebola crisis in Liberia.

The Academy of Neurologic Physical Therapy has elected **Heather Hayes** PhD'14 to a second three-year

SPOTLIGHT



Andrew Merryweather MS'07 PhD'08, a mechanical engineering associate professor at the U, directed the design of TetraSki—the world's first independent alpine sit-ski for any physical disability—which was profiled on NBC's *The Today Show*. The ski was designed and built by undergrads as a senior design project for Dr. Jeffrey Rosenbluth and the U's Spinal Cord Injury Acute Rehabilitation program. The prototype was further developed by mechanical engineering grad **Ross Imburgia** BS'14.

term as chair of its Stroke Special Interest Group. An assistant professor at the U, Hayes was also recently awarded a grant from the National Institutes of Health and a Center for Health Services Research Faculty Fellowship.

Signed to a four-year contract this spring, punter **Mitch Wishnowsky** BS'18 made his debut with the San Francisco 49ers in August. Wishnowsky says he and fellow Aussies often excel as punters thanks to playing Australian rules football. "We grow up trying to kick 60-yard goals."

Jessica Baynes BFA'19, now an associate instructor at the U, was selected as a 2019 TEDxSaltLakeCity speaker. Her talk, on rehabilitative ballet for those with neurological conditions, took place in September at Kingsbury Hall.



Jessica Baynes



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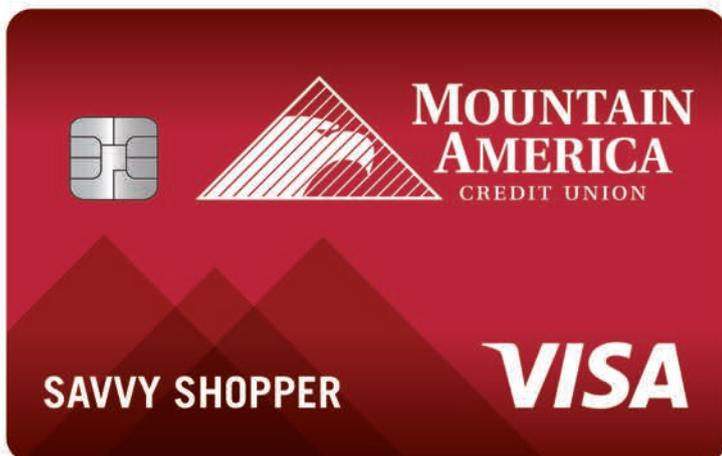
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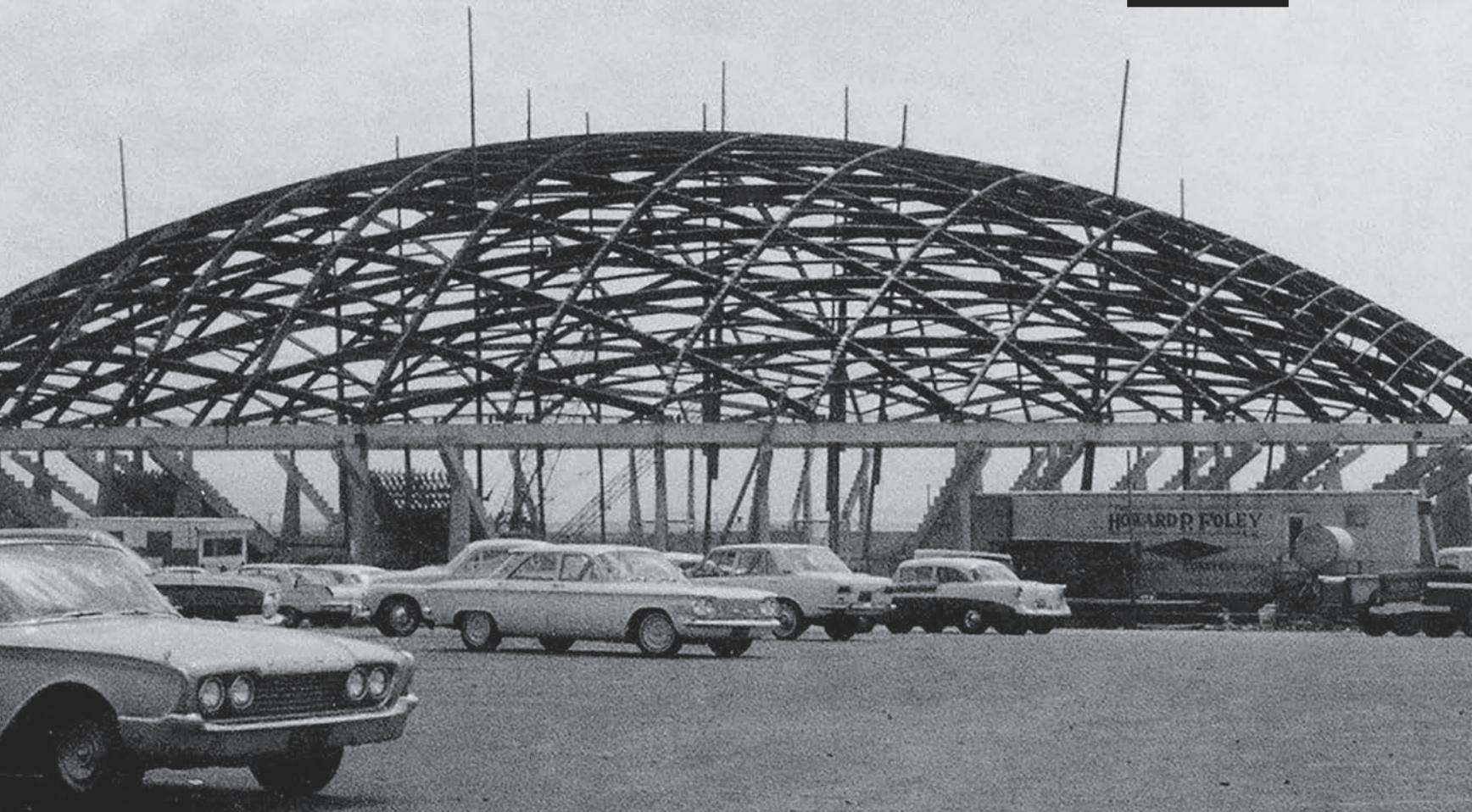
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Celebrating 50 Years

What do Elton John, the Dalai Lama, President Gerald Ford, and tens of thousands of U graduates have in common? They've all either performed, spoken, or received diplomas in the Jon M. Huntsman Center, which is celebrating its 50th anniversary this year. Millions of basketball, volleyball, and gymnastics fans have also celebrated spectacular victories and commiserated on agonizing losses since its opening as the Special Events Center in 1969. Visit utahutes.com/huntsman50 for more history and trivia, and share your favorite Huntsman Center memory on social media with the hashtag #Huntsman50.



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