CAS CADE

THE INTERNET OF THINGS

YOUR COMPUTER CAN CONTROL YOUR STUFF. NOW WHAT?

AT THE TRAILHEAD FOR LIBERAL ARTS, AND LIFE

PLANS TAKE SHAPE FOR TYKESON HALL—THE COLLEGE AND CAREERS BUILDING

What a difference a year makes. When I first reported on the College and Careers Building in winter 2015, it was just an idea—but an idea that had major funding from our lead donors, Don and Willie Tykeson, whose generous $10 million gift, coupled with $17 million in state funding, will make this remarkable facility a reality.

Now that we are well into the planning process, I can share with you what Tykeson Hall will do in a concrete way—literally—to place our students on track for lifelong success.

Situated in the heart of campus, this 55,000-square-foot facility will house key components of the College of Arts and Sciences and the UO Career Center, creating a hub where students can connect their academic and life interests to a rewarding education and career path. The College and Careers Building represents a new concept in university education—a trailhead where students begin their guided journey through the liberal arts and discover the tools and passion that take them to a lifetime of personal and professional achievement.

In this building, students from across 46 majors of the college will:

- develop fundamental communication and reasoning skills.
- apply critical reasoning skills to issues in the university, the community, and the world.
- integrate their passions and interests with their academic and career choices.
- find an academic home within a large college.

How will we do this?

First and foremost, we must "activate" the building. We'll do this by bringing our introductory composition classes—

W. ANDREW MARCUS, INTERIM DEAN

taken by 6,000 students per year—and many of our introductory math classes—taken by 3,000 more—into the building. In these classes, they will gain skills that are fundamental to any liberal arts education: good communications and quantitative reasoning.

But students will see far more than instruction devoted to writing and mathematics. On their way to these introductory classes, they will see numerous career-related activities that will engage them through the remainder of their undergraduate education and beyond.

For instance, in this building they will be able to sign up for real-world experiences that draw so many of our students in their junior and senior years. Internships, undergraduate research programs, and the community literacy initiative (to name a few) will be housed in Tykeson Hall.

Of course, central to the name of the building—College and Careers—will be Career Center activities. Career Center staff and programs will be integrated with academic advising and programs. For example, a general-education cluster focusing on global health

will have advisors close to Career Center staff who specialize in health occupations. Advisors to language and literature majors will share office space with experts in jobs for those with language, communication and other interests.

We will also have incubator spaces for new academic programs within the college, such as disability studies and the environmental humanities. These areas will encourage faculty collaboration with one another, and with students.

We hope to break ground in one year, a schedule that will be dictated in part by raising the remaining funding that will bring this project to life.

Ultimately, however, I realize that anything I write about Tykeson Hall will not compare to what Robert Frost accomplished in his poem, "Two Tramps in Mud Time." In the writing, perhaps he envisioned this building:

But yield who will to their separation,
My object in living is to unite
My avocation and my vocation
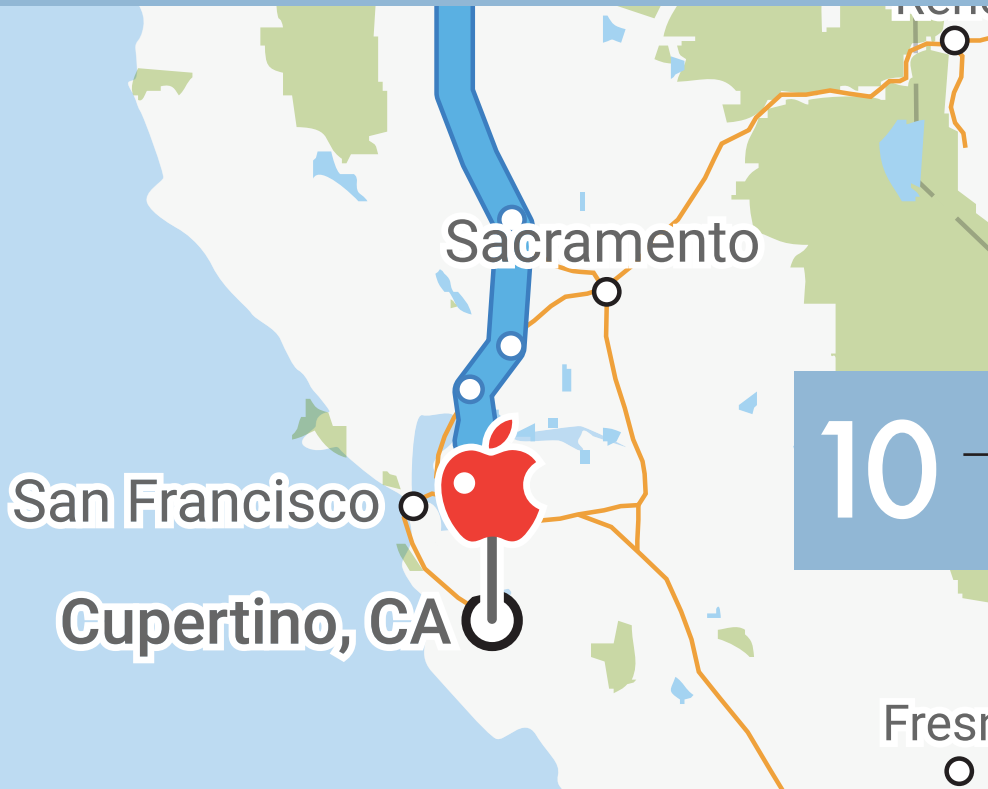*As my two eyes make one in sight.*

W. Andrew Marcus is Interim Tykeson Dean of Arts and Sciences. He is a professor of geography and proud parent of two UO graduates and three current UO students, all in the arts and sciences.

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BEING HUMAN

Viewing medical debates through lens of bioethics

INTERVIEW BY MATT COOPER

G ENETIC ENHANCEMENT. Abortion. Assisted suicide. Informed consent.

These are among the most contentious topics in medicine, because they force us to ask ourselves, "What does it mean to be human?" When does human life begin, and end? Do we have the ultimate authority to dictate how and when our lives come to a close? What if we're incapacitated? Could that render us less than human?

These questions keep presenting themselves to Nicolae Morar in new contexts.

Morar, an assistant professor of environmental studies and philosophy, specializes in bioethics—the study of ethical issues emerging from advances in biology and medicine. His exploration of the philosophical arguments underlying life and how we care for it has taken him from UO biology laboratories to bedside at the largest hospital in the region.

Morar has been selected to receive a prestigious UO teaching fellowship— the Robert F. and Evelyn Nelson Wulf Professorship in the Humanities—which he will use to design a new course in clinical ethics. This 10-week program will take students into Springfield-based PeaceHealth Sacred Heart Medical Center at RiverBend to explore, in a clinical setting, ethical dilemmas as they emerge in real life.

Q What abuses led to the founding of bioethics?

NICOLAE MORAR: Bioethics emerged in part as a response to some of the most morally egregious cases of human experimentation, not just during the time of the Nazi camps but also the Tuskegee (Alabama) syphilis experiment, where physicians were experimenting on human beings under absolutely deplorable ethical conditions. Bioethics offers a position from which we will always protect human dignity and personal autonomy.

Generally, people understand bioethics as medical ethics. But it also tracks relations between humans and their environment—for example, how living around sources of pollution affects health or how human impact could irremediably destroy nature. I'm part of a group advocating for an environmental understanding of bioethics as well, to think of questions of health more holistically, from human to ecosystem health.

Q What's been in the news lately that intrigues you?

NM: It's very interesting how the assisted suicide debate evolves. If human life is a gift from God, then it's probably not something over which I should have the final decision of how to dispose of it or what to do in those final moments. But if we think of human beings as rational entities that can self-determine their behavior, that takes you in a different direction. And physicians—their vocation is to heal and to "do no harm," but what's harm? Isn't there harm in letting someone go through months of suffering when the quality of life is diminished?

Q What will your students be doing in the clinical ethics course?

NM: The goal is to provide students ways to think about bioethical dilemmas and then expose them to real cases in the hospital. When we talk about stress in the medical profession, they'll talk directly to a nurse because nurses experience that every day. When we talk about emergency medicine, we'll hear from the physician who says, "Yes, we've got 30 patients coming in, it's very hard for us, I'm always trying to do the moral thing, here's how I try to think critically about these decisions."

With my students, if we're talking about assisted suicide or informed consent, they relate rationally to the cases, but it's very different when you start relating emotionally. You cannot understand bioethics until you face the suffering that goes on in a hospital—then you can say, "Yes, informed consent truly matters." Until you see a family completely split over the decisions to be made for a patient, or how difficult it is for health-care personnel when a cousin and a mother go in completely different directions regarding consent, you don't realize what informed consent is.

This course starts in winter 2017—a 10-week program, one week in the classroom, one week in the hospital, alternating. It would not be possible without the help of John Holmes (the hospital's director of ethics) and the Oregon Humanities Center.

Q **I understand your thinking about human health has expanded to include microbes?**

NM: Historically, we have thought of the human organism as made only of human DNA—half from my mom, half from my dad, and the way I function is supported by this cellular material. That's the concept that I came to the UO with, and then I met microbiologist Brendan Bohannan. And he said, "That's probably false." (Morar laughs). He showed me that in terms of biological diversity, what makes us human, in a lot of ways, is the number of genes that *microbes* are adding to us—adding to our body, microbes on our skin and especially in our gut.

We are mainly made of microbial cells. Most digestion is done by microbes, and the ways in which they achieve this affects who you are as a human organism. Which ones are in your gut, for example, really matters as far as whether or not you're at risk to become obese.

I thought, "This is amazing, the question of what it means to be human comes back to me in one of the most interesting and challenging ways." Microbiologists are saying, "Stop thinking of microbes just in terms of germs that you fight; they do more good for us than you can imagine." If we think of our microbes as an organ, that could affect therapies. If you have heart failure, we'll try to find you a heart transplant; if you have a failure with the function of your microbiome, there is now a procedure to "transplant" microbiota into your system. The notion of health is much more dynamic than we thought previously.

Q **How does the human microbiome relate to philosophy?**

NM: Scientists often believe there is an overarching framework that explains the whole story about a certain phenomenon, such as the human microbiome. Philosophers can highlight the assumptions that scientific knowledge is based upon and show the limitations of certain scientific claims. As a result, there are five or six competing views that explain our relationship with the microbes that have made a home of our bodies.

Brendan and I are evaluating those concepts and the ways in which each fails, in some way, to tell the whole story. We're saying, "Don't rush this process." There are numerous concepts trying to capture this phenomenon—that shows the complexity of the phenomenon and that no single framework could capture it on its own.
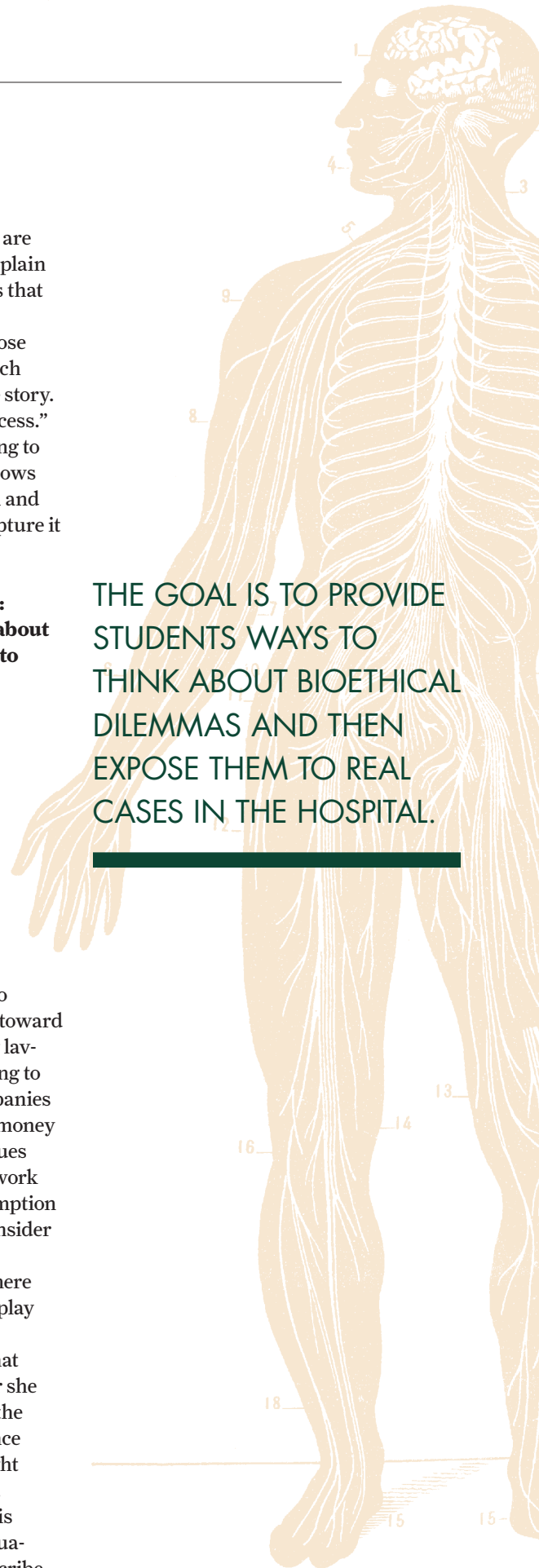
Q **Another medical debate: What have you learned about Big Pharma giving gifts to physicians?**

NM: In an effort to promote drugs, pharmaceutical companies invest tremendous amounts of money in gift-giving to physicians. Working with Natalia Washington (of Washington University in Saint Louis), we asked, "Why have legislative restrictions against physicians for receiving gifts had zero—or limited—effect?"

Physicians have been required to report gifts over a specified value, toward discouraging them from accepting lavish gifts that would be embarrassing to disclose. But pharmaceutical companies continue to spend more and more money on gift-giving—the practice continues unabated. The restrictions didn't work because they're based on the assumption that, as rational beings, we will consider the pros and cons of our actions.

Social psychology tells us that there are other parts of our cognition at play here. For example, if a physician is repeatedly presented small gifts that carry the label of a new drug, he or she is more likely to decide that that's the best drug, even without the evidence to support that belief. Those thought processes are largely unconscious. Physicians need to know that this is how the brain functions in that situation, and that they're likely to prescribe those drugs disproportionately. ◾

THE GOAL IS TO PROVIDE STUDENTS WAYS TO THINK ABOUT BIOETHICAL DILEMMAS AND THEN EXPOSE THEM TO REAL CASES IN THE HOSPITAL.

THE INTERNET OF THINGS

COMPUTERS CAN CONTROL EVERYTHING FROM THE THERMOSTAT TO THE FAMILY CAR—FOR BETTER OR WORSE

BY MATT COOPER

MAGINE: IT'S A WINTER snowstorm and you're driving in the mountains, late at night. You approach a narrow bridge—is it safe to use? Is there ice on it? You can barely make out the other side—could something be coming the other way?

Fortunately, this is no ordinary bridge. It's a smart bridge. Sensors in the cement monitor cracks and stresses; they can send data to engineers via the wireless Internet. These sensors can detect ice on the bridge and communicate with your car, which has sensors of its own—if there's a hazard ahead, on the ground or in your path, you'll be instructed to slow down. Someday soon, maybe the car will even slow down for you.

This Internet-age scenario comes from futurist and author Daniel Burrus, and there are scores of others: using an app to preheat the oven while you're still in rush-hour traffic, or stopping to grab a gallon of milk because your refrigerator texted your cell phone that you're out. Such conveniences are sure to lower your stress levels—those improved physiological readings will be sent automatically to your doctor via the heart-monitoring strip you wear on your chest.
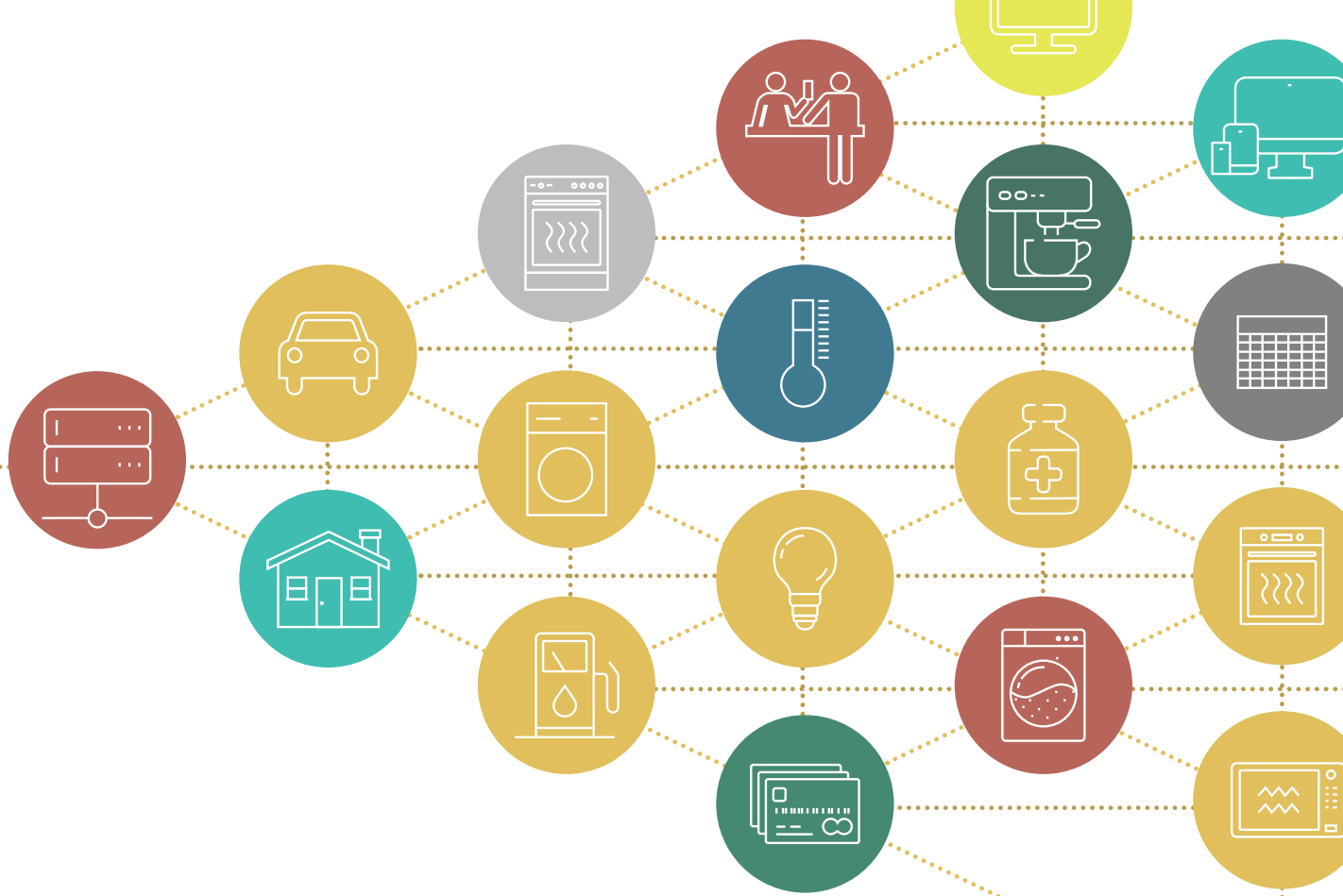
There is a name for the next tidal wave of technology: Internet of Things, or IoT. Place the emphasis on "things"—Internet of *things*—because that's the key piece: everything from your car to your thermostat to your dog and, yes, even you, could one day be wirelessly connected to the Internet to transmit and receive information and, theoretically anyway, improve quality of life.

"This is not something that's brand new," said Stephen Fickas (left), a professor in computer and information science at the UO. "It's just that enough people are getting their head around it to call it something. 'The Internet of Things' refers to the proliferation of computers into every nook and cranny of daily life."

Some predict 2016 will see an explosion in IoT applications and related jobs such as data-communications analysts and network-system experts. Hype around IoT might even understate its potential, which could bring an economic impact of $11.1 trillion annually by 2025, the McKinsey Global Institute reported.

Fickas isn't waiting to see if the predictions come true. Known for an innovative approach to education, he has

launched a course that gives students—inside and outside computer science—basic skills in programming, networks, and data analysis. The CIS department has seen the future: they believe it's one in which UO graduates must be able to speak "IoT"—regardless of whether they plan to be a software specialist or a Shakespeare scholar.

POCKET-SIZED BUT POWERFUL

On a recent morning in the Colloquium Room, an expansive setting in Deschutes Hall with blue couches and wall-length windows, freshman Sierra Battan clapped her hands for all she was worth: "CLAP! CLAP-CLAP-CLAP! CLAP-CLAP!"

On the desk before her, a dime-shaped sound sensor connected to a palm-sized computer recorded each instance and reported it, via the Internet, to the laptop computer of classmate Carson Hauth, sitting next to Battan. On Hauth's screen, each "clap" showed up as a data point like this:

192.168.0.100 [18/Nov/2015 18:14:04] "POST / HTTP/1.1" 200-

Battan had learned to write code that instructed the tiny computer to assign a value to each clap based on its volume.

Hauth, meanwhile, had written code directing the same computer to send a message—"Got Em"—and trigger a buzzer once Battan and classmate Jordan Blackburn had reported a specified amount of data.

The coding language is called Python. It's named for the British comedy group, Monty Python, and it's one of the hottest languages in the industry because it is both powerful and easy to learn. Fickas likes Python because it's "scalable"—blocks of coding can be easily grafted onto existing instructions to dramatically boost the computer's capability.

The computers themselves are also advanced: the class uses a half-dozen UK-made Raspberry Pis, which retail for about $35 each and can fit into your pocket, yet have enough oomph to provide an entire high school with a wireless Internet connection.

COME TOGETHER

This combination of cheap, powerful computers and an easy-to-grasp coding language enables Fickas to put undergraduates in computer science classes in an unfamiliar but invaluable setting: working together to solve problems.

"The way computer science is taught in schools, it's stand-alone," Fickas said. "You're on your laptop, I'm on my desktop, and we're building webpages and websites and so forth.

"The world is moving away from that," he continued. "The world is heading to 'distributed systems'—distributing the work among many computers. That's IoT. We need a sea change in the way we teach the introduction to computer science to capture this whole trend. This course is a pilot, in some ways."

As Fickas teaches it, the Internet of Things includes three elements: sensors in the field, capable of collecting raw data on everything from river temperatures to the location of a wayward herd of cows; a series of small computers that collect and transmit this data; and a powerful, central bank of computers—sometimes referred to as "cloud computing"—to analyze reams of information, produce answers, and even trigger actions.

Fickas' course, which he developed and taught for the first time a year ago, is a practical exploration of this increasingly computer-connected, computer-dependent world—both how it operates and what it means for society.

Working in groups, students program

Hauth (left) and Battan learned to write code that enabled a tiny computer to read and process loud noises and bright lights.

the small computers and link them together through a network of wireless and wired connections. They write code that enables the computer and its sensors to capture the activity around it—the sound of someone clapping or a bright light shone from a cell phone—and convert it into data that can be analyzed. Then, the students use the computers to analyze the data; with more coding, they instruct the computers to cull through thousands of data points to produce averages, means, and standard deviations.

By the end of the term, students are dreaming up theoretical applications for "smart cities"—think: how to program traffic signals to get commuters through rush-hour traffic—and fending off cyberattacks launched by Fickas himself.

NO COMPUTER SKILLS NEEDED

Fickas, who was honored last year as a UO Williams Fellow for his commitment to creating academically engaging classes, teaches the course in a "flipped" style, wherein students receive lectures at home via videos or electronic documents and class time is reserved for working on problems. The approach gets rave reviews: "I love this course to my core," one student wrote. "This is the way all college courses should be taught."

But the real innovation is that Fickas has modeled the class on the interconnected world that will await his charges once they graduate. With students such as Hauth acting as managers and others such as Battan and Blackburn

assuming the roles of data reporters, the class approximates the IoT relationship between a central computer and the numerous smaller computers in the field that must work together to send, receive, and analyze data.

None of the three students began the course with a shred of programming experience—making them precisely those Fickas hoped to draw.

Hauth, an international studies major, isn't sure what his career will be. But regardless, he's assuming that computer skills will be "a large advantage to finding a job."

"There are so many things you can code your Raspberry Pi to do," Hauth said. "I'm just starting to get a sense of that. When I chose this class, I was just

thinking, 'that sounds like something cool.' Now, I could definitely be into the actual coding of things. It's very fun to be able to solve problem coding or even make programs that do something."

Asked what kind of computer skills she had before the IoT course, Battan smiled and shook her head.

"I knew how to go to a website, (or do) word processing," she said. "Now I know how to write code, how to fix it, what integers and (programming) strings are. I know how to connect to a different computer and how to have computers communicate with each other. I know how to collect and analyze data."

Like her father, who works in information technology, Battan has always been good at math. But she never really

> GRADUATES MUST BE ABLE TO SPEAK "IoT"—REGARDLESS OF WHETHER THEY PLAN TO BE A SOFTWARE SPECIALIST OR A SHAKESPEARE SCHOLAR.

understood his job, and she teased him whenever he lapsed into geek-speak—say, describing his projects by their IP address (that's Internet protocol address, which is the numerical label assigned to any device using the Internet for communication).

On the strength of the IoT classes alone, Battan is now essentially following in her father's footsteps. She has decided to major in "MACS"—math and computer science, a combined discipline that gives students the tools to analyze complex problems and compute the answers to them.

Under the MACS program, Battan will learn how to become a team player in a tech occupation. Her experience in Fickas' course has already sparked in Battan interest in careers where she might use IoT approaches to help companies improve how they operate.

"I want to do some kind of real-world application," Battan said. "Take data and manipulate it to help you find what you're looking for."

Fickas encourages his students to engage in this kind of theorizing about

DIGGING DEEP INTO DATA

NEW COMPUTER SCIENCE MINOR WILL BUILD NUMBER-CRUNCHING SKILLS FOR ANY FIELD

JOE SVENTEK HAS BEEN talking to employers across Oregon, and he keeps hearing the same thing: give us graduates who can work with data in our field.

"I've talked to a lot of people who want to hire people who can do the data analysis—in their (business) domain," said Sventek, head of UO's computer and information science department. "Right now, they have a choice between hiring someone with a computer and information science degree who doesn't know anything about their domain, or someone who knows their domain and knows nothing about computing."

Said Sventek: "It's easier to teach the 'domain scientist' enough about computing and data analytics to help them make inferences from raw data, than to take a computer scientist and train them all about, say, medicine."

That's the basis for the data science minor that the department plans to introduce this fall.

We're living in a world where our ability to collect and analyze data is expanding exponentially. The minor will guide computer science students and non-majors alike through the management of data, cleaning it up—that is, eliminating anomalies, redundancies, and errors—and conducting meaningful analysis.

In short, students will learn how to dig into the numbers to identify trends and patterns, a skill that would be useful for almost any employer.

"There isn't a single discipline in the university where people aren't confronted with larger and larger volumes of data," Sventek said. "I want to help students take these data analysis tools and use them. It's like 40 years ago, we all had to know how to use a slide rule."

Stephen Fickas, a CIS professor, includes a data-science component in an innovative course called the Internet of Things, or IoT, which explores the advance of computers into almost every aspect of modern life.

"I echo Joe's experience that local industries are calling for many more data-science graduates," Fickas said. "They are also calling for those with skills in IoT. If some subset of students that we graduate have skills in both, I guarantee they will be in high demand."

Data mining is valuable to disciplines ranging from chemistry to classical literature. The digitization of books, for example, means that instead of studying four or five novels at a time, humanities scholars might study 10,000, looking for trends across time or continents.

At the UO, professors are developing a course in which students from computer science and the humanities will use data mining to analyze Mary Shelley's *Frankenstein.* They'll learn how to present their results visually and to make discoveries, said coordinator Heidi Kaufman, an associate professor of English.

"Data mining and digital humanities are not replacing more established patterns of research," she added. "They're opening new interdisciplinary doors and expanding methods of inquiry in humanities fields."

—MC

Fickas (below, with Hauth) launched cyberattacks that his students repelled by using secret words embedded in their computer messages.

NONE OF THE THREE STUDENTS BEGAN THE COURSE WITH A SHRED OF PROGRAMMING EXPERIENCE— PRECISELY THOSE FICKAS HOPED TO DRAW.

possible applications for IoT. In fact, he requires it: the final project of the term is to devise ways that an elaborate system of sensors and small computers could improve the quality of life in Eugene.

It was easy for Sophia Gossard, a freshman majoring in architecture, to dream up some ideas—as a daily biker, she's encountered numerous situations that could be improved with the emerging technology.

Bike theft, for example: Gossard proposed putting sensors in bike locks that could send a text to the owner if the lock is being jimmied or broken. Cars could be equipped with sensors that indicate when a biker in the blind spot is close to the car; in the event of a collision, the bikes themselves could carry impact sensors that send an emergency text to the police and paramedics, complete with the bike's location.

"Before this class, I had no idea what 'the Internet of Things' meant," Gossard said. "There are so many ways that you can use this technology to gather infor-

mation and then distribute it."

WHEN TEACHERS ATTACK

On a Wednesday morning near the end of the 10-week term last fall, Fickas introduced Battan and the rest of the class to the flip side of the Internet of Things— namely, its vulnerability to attack.

Working from his laptop, Fickas was able to eavesdrop on data messages that the student teams were sending one another. Then, he injected faulty information and commands into the communication, corrupting how the students' computers performed their tasks.

"Aaaaaah," Battan muttered—"no, no, no . . ." Her network had been invaded, and now the sensors connected to her computer were producing line after line of fraudulent data.

"Your goal is to stop me from doing this," Fickas said, chuckling—"other than throwing my laptop out the window."

The students were instructed to come up with a secret word and include it in

the coding used to make their computers perform tasks and talk to each other. Then, by directing their computers to recognize only messages and commands carrying that word, they were able to repel Fickas' attacks.

Battan was a quick study: within minutes, she had set up an effective defense and could watch with amusement as Fickas—posing as her partner, Carson Hauth—tried and failed to hijack her computer. "He's trying to hack me, but my computer is not running," she said, smiling. "It's waiting for the real Carson, not the fake Carson."

Fickas calls these man-in-the-middle attacks. It was clear from the laughs erupting every time a team repelled his advances that this lesson in online security was a big hit.

But where IoT is concerned, the real lesson is that there's no such thing as a perfect defense.

"It's a cat-and-mouse game," Fickas said. "You can stop a certain type of attack, but another one always springs up." CAS

A DRIVING DILEMMA

Should your car make life-or-death decisions?

Self-driving cars are coming. They're expected to dramatically improve traffic flow and eliminate as much as 90 percent of accidents.

There's just one problem: if you're in one and a crowd of people suddenly appear in your path, the car might decide that the moral thing to do is swerve into a wall, saving many and sacrificing one—namely, you.

That's a scenario that Azim Shariff, an assistant professor of psychology, used to test the willingness of people to buy "autonomous vehicles," which use radar, global positioning systems, and the Internet

PSYCHOLOGISTS FOUND PEOPLE WANTED TO SEE *OTHER PEOPLE* BUY SELF-DRIVING CARS, RATHER THAN PURCHASE ONE THEMSELVES.

to sense their surroundings and maneuver down roads without driver assistance. The Google Car, for example, has already covered thousands of miles of test driving.

Working with colleagues in France and Massachusetts, Shariff (left) found that people generally support programming self-driving cars to minimize an accident's death toll. But the picture changes when the car owner's life is at stake: people generally wanted to see other people buy self-driving cars, rather than purchase one themselves.

"What we observe here is the classic signature of a social dilemma," the researchers reported. "People mostly agree on what should be done for the greater good of everyone, but it is in everybody's self-interest not to do it themselves."

It's for this reason that respondents felt manufacturers won't even make cars that might one day choose to claim the life of the person behind the wheel. This feature is not exactly a selling point when you're kicking tires on the lot. One maker, Tesla Motors, requires the driver to activate the "automated overtaking" function, toward reducing the company's liability for choices

that the car makes.

The decision-making that guides self-driving cars will be dictated by "moral algorithms"—formulas that will be based on society's expectations for what should occur in any given situation. Shariff's team argues that psychologists need to be at the table, defining the algorithms and basing them on tests in experimental ethics involving self-driving cars and unavoidable harm.

"It is a formidable challenge to define the algorithms that will guide self-driving cars confronted with moral dilemmas," the team reported. "These algorithms must accomplish three potentially incompatible objectives: being consistent, not causing public outrage, and not discouraging buyers."

The work has generated considerable interest, not just among academics and researchers, but also the lay audience—the team even heard from car maker Renault.

"There has been a lot of media attention and interview requests," Shariff said. "We also heard from a philosopher who works on the issue."

—MC

Eugene, OR

🚗 **8 h 43 min**
566 miles

🚗 **9 h 12 min**
565 miles

Redding

🚗 **1**
670 m

ENTER
DESTINATION:
APPLE

Five alums with advanced skills in digital mapping land jobs with the innovative tech giant

BY MATT COOPER

Sacramento

San Francisco

Cupertino, CA

EARLY IN HIS FOUR years at the University of Oregon, as Neal Horner began to contemplate careers, his dad mentioned an emerging field—geographic information systems, or GIS—as an opportunity his son might want to consider.

They didn't speak in any detail about mapping services like Google Maps or in-car navigation devices or any other type of well-known GIS application. It was just a tip, father to son. But that was enough.

Horner, a geography major, started poking around. "Emerging field" scarcely captured it. GIS seemed to have an integral role in a vast range of potential professions: archeology, city planning, environmental monitoring, forestry, homeland security, law enforcement, health and human services, real estate. Public sector, private sector, profit, nonprofit—thousands of jobs in almost every field imaginable had some sort of need for location-based data.

Horner was sold. He started loading up on classes that would eventually earn him a specialization in GIS to augment his geography degree. He knew he liked computers. He knew GIS would dovetail nicely with his interests in land management and the environment. And he knew there were good GIS jobs out there.

But he didn't imagine that he would step, straight from graduation in June 2015, into an opportunity with one of the most innovative employers in the world: Apple Computer. Nor did he imagine that the Cupertino, California-based tech giant would also scoop up four of his classmates from the UO GIS program, in the span of a year.

SWORN TO SECRECY

Horner, along with Adam Oldenkamp, Riley Champine, Carolyn Gilchriese, and Emily Nyholm, are now a cohort of five newly minted Ducks, living under one roof in suburban Silicon Valley, pinching themselves each day they go to work and geeking out each night at home, trading the latest hot examples of digital mapping.

Today, they are all GIS technicians for Apple—Nyholm, BS '14, is a full-fledged employee and the other four, all 2015 graduates, are under contract with the opportunity to follow in her footsteps.

Apple, being Apple, has sworn them to secrecy about their work, so none of them are free to discuss the exact nature of their employment. But what they can talk about, in detail and with much enthusiasm, is how their GIS training at the UO—in the classroom and in the renowned InfoGraphics Lab—prepared them to land jobs immediately after graduation with a Fortune 5 technology leader.

The UO Department of Geography—

Neal Horner, '15
Horner found that thousands of jobs in almost every field imaginable—public sector, private sector, profit, nonprofit—had some sort of need for location-based data.

ranked among the 10 best nationwide—offers geographic information science as a distinct track, on equal footing with traditional specializations such as physical geography. In the GIS track, students get both mapping and data-analysis skills through a twin-pronged education that prioritizes both the classroom and the laboratory, both learning and doing.

"The geography curriculum set me up for success in the lab, which set me up for landing this position," Riley Champine said. "I had no inclination to do geography—I didn't know what geography was as a discipline until I took a GIS class the spring term of my freshman year.

"Now I realize some of my first geography professors were just really passionate about what they did," he added. "I fed on that energy and it drew me into the major."

A DIFFERENT WAY TO LOOK AT DATA

The GIS field breaks out into two areas: data analysis and mapping.

At a minimum, this means working in the two dimensions of latitude and longitude, or X and Y coordinates. Then there are the endless ways to assess any

given spot: weather conditions, food supply, income levels, soil composition, traffic patterns, cancer rates, population figures, and a hundred other variables, a list limited only by the reach of technology and one's imagination. As a result, GIS sometimes means working in three dimensions, professors say. Sometimes four.

Carolyn Gilchriese still remembers her first reaction to the oceans of data used in GIS: *wow*.

For Gilchriese, interest in the field built as she was taught how to manage huge data sets and present the results in a clear, attractive manner. Even at the introductory level, she learned to map an area and assign values to, say, a vineyard, identifying the best spots for growing grapes based on pH levels, soil density, and microclimate.

"I was blown away—'Wow, we can do all these things,'" Gilchriese said. "It was a different way to look at data—instead of Excel and bar graphs, it was very spatial and visual. It's very hands-on, working with these (GIS software) programs. Doing things like that in a classroom creates a passion in the student to move forward."

THE BIGGER THE BETTER

In upper-level courses, students learn the latest tools and techniques for finding relevant information themselves, cleaning it up, analyzing it, and drawing meaningful conclusions. That's where Adam Oldenkamp began using GIS to solve problems.

He acquired a skill called "scripting"—issuing commands in a computer language that directs a "script" or program to run tasks that would otherwise

Carolyn Gilchriese, '15
"It's very hands-on. Doing things like that in a classroom creates a passion in the student to move forward."

be done (much more laboriously) by a human. The popular scripting language Python, for example, can be used with ArcGIS, a geographic information system that creates and uses maps, compiles geographic data, and analyzes mapped information.

Said Oldenkamp: "You can take huge quantities of data, run complicated formulas on it, and come up with this elaborate visualization that, had you done it without any aid, would have taken a really long time."

It starts with collection: upper-level students are taught how to tap information repositories run by governments and other entities where computer programs and the codes that run them are free and available to the public.

Students are trained to work with big data sets, Oldenkamp said—the bigger the better. With scripting, he was able to electronically sift through massive data banks on topics such as climate or census figures, posing questions, finding patterns, and drawing conclusions.

The process ends with what Oldenkamp calls "the aesthetic"—presenting results in an appealing way, through maps and infographics.

"It's 'how do I highlight what's important, how do I stay fair to the data, what story am I telling, and how do I present

Adam Oldenkamp, '15
"How do I highlight what's important, how do I stay fair to the data, what story am I telling, and how do I present that in a visually effective manner?"

that in a visually effective manner?'" Oldenkamp said. "There is a panoply of skill sets, any one of which could become a career opportunity after graduation."

IT'S ALL ABOUT DEPTH

Much of the geography department's approach to teaching GIS is about breadth—for instance, giving students a taste of the ever-growing array of software tools used to crunch data and present it visually.
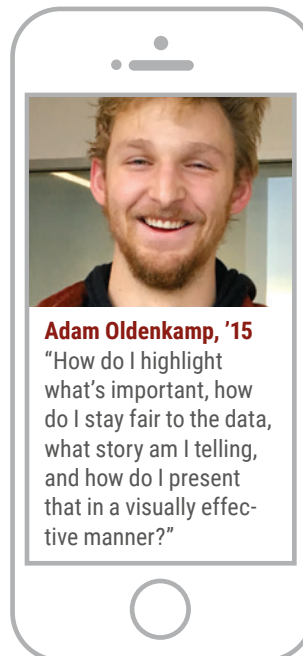
But when it comes to mapmaking, Riley Champine can tell you, it's all about depth.

The upper-level advanced cartography course, for example, starts with map design and production methods, then moves into use of color, cartographic visualization, graphing, and data graphics theory. It culminates with the integration of GIS and graphics tools.

At its heart, the course asks of students what Champine called a "deep academic question": can you develop a data-driven map from scratch, moving it from an original idea to a finished product?

"The vast majority of the course was dedicated to that single project, with the expectation that the map you're going to create—and you're getting graded on—is going to be the most aesthetically pleasing map," Champine said. "It's seven weeks not just of point-and-click, but thoughtful development into making the best design possible."

In his project for the class, Champine, a soccer fan, told the story of professional soccer in America. He charted the league's growth in attendance and mapped each team's location, market reach, attendance, and facilities. The

Majoring in
Space and Place

NEW GEOGRAPHY FOCUS SERVES GROWING TECH INDUSTRY

WHEN CHRIS BONE looks out at the students in one of his geography classes, increasingly there is a new group looking back at him: computer science students.

It's no surprise, given the course. Our Digital Earth covers the countless ways that technology allows us to use information tied to a geographic location. It's all about smartphones, social media, mapping software. It's as much computer science as geography.

The course, also taught by department head Amy Lobben, is an introduction to the exploding industry of spatial data and technologies, and students with backgrounds in both computers and geography are particularly well-positioned to succeed here. That's not lost on those computer science students in Bone's class.

"Before, we were explaining to students the importance of location-based services and geography," said Bone, an assistant professor. Today, "they already know that. There are a lot of students who want to become computer and information science majors who are *so* interested in this whole world of spatial data and technologies. They see this connection between geography and computer science."

The geography department is accommodating them by launching a new major: spatial data science and technology, which will teach students how to capitalize in an arena where the collection of data and the uses for it are expanding exponentially. Students can start taking courses now that count toward the major.

The focus, Bone said, "is to make students competitive in an industry that is calling for a lot more geographers."

The major will serve students who want to learn the coding to run location-based computer programs. It will also cater to students drawn to spatial data analysis—that is, using location-based information to tell a story or find an answer. Everyone will get a taste of the latest spatial analysis software applications, which seem to emerge daily. And

technologies seem endless.

Facebook leads the crush of social media- and Internet-based companies asking us to check in wherever we might be at any particular moment.

Census information shows where in the city incomes are highest or crime is lowest. Climate change? Analysts use spatial data and technology to tell you who is most vulnerable given where they live and what the conditions are today—or what they will be 100 years from now.

EVERYONE WILL GET A TASTE OF THE LATEST SPATIAL ANALYSIS SOFTWARE APPLICATIONS, WHICH SEEM TO EMERGE DAILY.

computer science students will have an easy avenue to a double major.

Students will learn what Bone calls "spatial thinking": the ability to understand the heart of a geography-based problem, how to solve it, and—always an important question for scientists—how to present it clearly to the public.

Chris Bone

"Companies have their software engineers," Bone said. "Our students will have had enough exposure to programming to communicate with them. They can tell the programmers and engineers, 'You need to develop this kind of application to solve the problem.' We want our students to become the problem-solvers in these environments."

The applications of spatial data and

Business? What company *doesn't* want to know where its customers live or where they go, day-to-day?

One of the biggest growth areas for spatial data and technology is humanitarian applications. Satellites show advocates which regions in the world are experiencing conditions—environmental or political—that could lead to conflict. Aid organizations, meanwhile, use social media and mapping software to speed disaster relief to victims able to tweet their locations or post to Facebook.

In such life-or-death situations, success or failure can hinge on one's ability to quickly grasp the lay of the land. But that's what geography is, of course.

Said Bone: "Geographers have a cultural and environmental awareness that, coupled with knowledge about location-based data, make them very useful for applying these technologies in different parts of the world."

—MC

map took first place in a nationwide contest run by *National Geographic*.

The gift of the course, Champine said, is that it makes students as detail-driven as any working cartographer.

"To really excel in that class, you're delving into the details so much, you're obsessing about what the font is going to be and what color the background is going to be and you change it 600 times before you're satisfied," Champine said.

"In print cartography, that's what people do. You have to be obsessed with it," he added. "And that's where the geography department succeeded for me—it made me obsessed with it."

WORKING WITH CLIENTS

The UO InfoGraphics Lab is a special-projects lab inside the Department of Geography. It pairs students and professional staff to complete real-world projects for UO faculty, campus offices, and outside government agencies. Projects range from the creation of regional atlases to the development of iPhone mapping applications; all of them share the focus on integrating GIS and graphic-design tools with cartography.

For Emily Nyholm and her four fellow alumni now at Apple, there's no way to overstate the role the lab played in where they are today. Simply put, the lab gives students experience working with clients.

Nyholm—along with Champine—participated in an innovative, data-rich project with the University of Wyoming to produce an atlas for the migratory patterns of that state's hooved animals.

Scheduled for release in 2017, the *Atlas of Wildlife*

Riley Champine, '15
"That's where the geography department succeeded for me—it made me obsessed with the details."

Migration: Wyoming's Ungulates will cover more than 70 migration topics, ranging from ecology to conservation and management, illustrated with maps, graphics, and photographs. It will serve as an authoritative reference book, and migration stories in the atlas will be accessible online in an interactive format, with animations, interviews, and other links.

As student cartographers working with the professional team under James Meacham, executive director of the InfoGraphics Lab, Nyholm and Champine designed and laid out pages, including maps, charts, and graphs. With a wealth of data at their fingertips—some of it geospatial, some of it specific to mule deer and other animals—the two had the daunting but rewarding opportunity to help decide how to tell the story of the animals' amazing cross-state journeys.

A POWERFUL PORTFOLIO

"That was really exciting—it's like, 'All right, we want to do a page on bison, so what kind of story in these two pages do we want to tell?'" Nyholm said. "'What is their lifecycle, their migration pattern?' It was really interesting to say, 'Here's one topic and all of these different things that we can look at using spatial data—can we answer multiple questions in one chart?'"

Emily Nyholm, '14
"There are so many variables in GIS. You have to ask the right questions to make sure you get the right answer, the right priority."

On one level, the benefit to Nyholm was tangible—the pages she helped design became her portfolio. That proved to be a valuable and uncommon asset during job interviews, given many college graduates seeking their first job haven't yet established a body of work.

Perhaps more important, though, Nyholm experienced GIS in practice with an actual client, contributed to a major project, and adhered to a work schedule for meeting a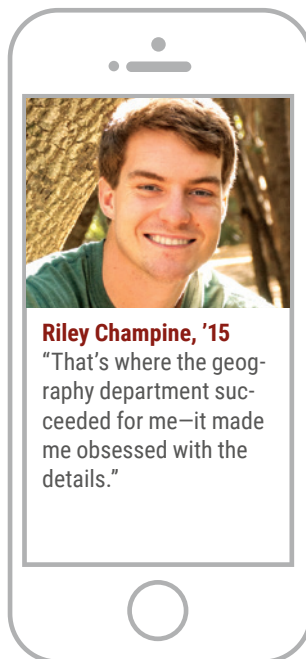 series of deadlines. She saw firsthand how GIS professionals organize a job, divide duties, and work closely with clients to sharpen the focus of an undertaking into an achievable product.

"It helped me a lot to figure out—when I'm working with other people—that I need to ask the right questions," Nyholm said. "You need to be able to communicate really, really well: 'I need more information to make sure I understand what you're expecting.'"

"There are so many variables in GIS," she added. "You have to ask the right questions to make sure you get the right answer, the right priority."

Adaptability is the currency of GIS, according to Chris Bone, assistant professor of geography and a GIS specialist. It's a skill he saw these five students hone in class and in the lab.

"Most important is this idea of 'spatial thinking,'" Bone said. "Given a problem, they know the type of data they need to collect and a suite of analytical methods that can be applied to generate solutions. Essentially, they're becoming the problem-solvers in GIS environments." CAS

MAPPING OUT A CAREER

DATA SCIENCE MEETS CARTOGRAPHY

IF YOU MAJOR IN geography, you are likely to get this reaction at some point during your education:

"Oh, you're into geography? You must be good with state capitals."

Senior Julie Stringham rolled her eyes. She's had more than one opportunity to field this. "I tell them, 'I'm a data scientist,'" Stringham said. "'Spatial stuff is what I'm into.'"

"Spatial stuff"—or geospatial information—is any data that describes the location and names of features beneath, on, or above the earth's surface.

It's the bread and butter of the InfoGraphics Lab. In this nationally recognized arm of the geography department, promising students such as Stringham work with professionals on actual geospatial mapping projects for clients—and gain marketable skills while they're at it.

On a recent Friday morning, Stringham sat at a desk facing two computer monitors. On the right one was a digital map of campus with small flags showing the location of commemorative trees, plaques, benches, and art. On the left one, line upon line of computer coding—basically, instructions a computer followed to build the map.

Stringham decided to change the color of the art flags, which were turquoise. With a couple keystrokes, she entered the value for the color red—#de2d26—on a line in the coding on the left monitor and, just like that, the flags turned red on the map to her right.

It was a simple task, but that's the point: computer programming skills are becoming imperative for working with the latest mapping software and geospatial data, because changes can be made with the press of a button.

Historically, if changes were necessary for Stringham's online map—say, a new

> ## "WE'RE NOT TRYING TO TEACH YOU HOW TO USE A MAPPING APPLICATION— WE'RE TRYING TO TEACH YOU HOW TO MAKE ONE."

As quickly as Stringham learns one tool of the geospatial trade, she dives into another.

tree had been planted somewhere on campus—she would have had to take the time to electronically draw the feature, taking care to find the precise spot at which to locate the new tree.

But Stringham's mapping application was drawing its information from the department's database, which keeps the latest data on the location of commemorative trees. To relocate a tree's position on her map, she would need only to change that value in her mapping program, and the tree would appear in the proper spot on her map.

"We have two data sources happening here," Stringham said. "We're drawing data from our database—those are the features on the map. And the rest"—that is, the map itself—"draws from a web-based data source that hosts the map."

For this map application, Stringham used a computer-programming language called Javascript, a digital mapmaking tool called Leaflet and a mapping data source developed by the lab's Campus GIS and Mapping Program.

But if Ken Kato has anything to say about it, with the next assignment Stringham will use yet another programming language and another mapping application. And so on, with each new project.

Given the ever-expanding landscape of new GIS tools and methods, Kato, the lab's associate director and director of the mapping program, emphasizes the value in practicing new approaches for solving the same problems.

"The more tools they can bring to bear, the better," Kato said. "We want Julie and others to get the same experience in solving a campus problem that an employer would ask. We're not trying to teach you how to use a mapping application—we're trying to teach you how to make one."

For a capable student such as Stringham, the goal could be building an advanced mapping tool such as Mongoose. The lab built the mapping application for the university's incident-management team, which wanted a way to share the status of issues during events such as home football games and the 2012 Olympic Team Trials in track and field.

Drawing from a variety of spatial data sources maintained by the mapping program, Mongoose enables safety officials to communicate and share critical information during an event. Using an iPad, for example, an official could place a flag on a digital map of Autzen Stadium to show the location of a burst water pipe during a football game; the flag would pop up on the screens of other officials using the map, and all communications tied to resolving the issue would be attached to that flag.

As geospatial technologies continue to evolve, the ability of geographers to solve problems such as this one will be bound only by their proficiency with the latest mapping tools.

"Mongoose exemplifies the ability to deviate from the methods and software we've used in the past to come up with new ways of carrying out a task," Stringham said. "I'm excited to become more familiar with this process."

—MC

SPANGLISH SPOKEN HERE

Washateria Lavanderia

Innovative program serves Spanish speakers who grew up with the language

There's no other way to say it: Spanglish is *una lengua muy importante* for getting by in the United States.

Believe it or not, the sentence construction above does not make Claudia Holguín Mendoza cringe. In fact, the assistant professor of Spanish welcomes the blending of the Spanish and English languages spoken by a growing number of Americans, not to mention Ducks.

Holguín Mendoza is tearing down stigmas and stereotypes associated with those who use Spanglish—chief among them, perhaps, that these speakers are somehow engaging in a lesser form of communication. She sees Spanglish as an important and rich linguistic practice in America, and she's teaching a new course that redefines what it means to be bilingual.

In Spanglish (SPAN 248), students explore Spanish and its variations as integral to American culture. While teaching the course, Holguín Mendoza mixes English and Spanish, sometimes blending the two in sentences, sometimes in words (a favorite example of hers: "washateria," for a laundromat).

It's called code-switching—alternating between two or more languages in a single conversation. It can help one learn both languages, Holguín Mendoza says, and it's done by most bilingual speakers the world over.

As America's largest minority, the Hispanic population reached 55.4 million in 2014, or about 17 percent of the total population. That growth is reflected in Spanish classes at Oregon: two courses on Latino heritage have doubled in size since their inception in 2012.

Many of the students in these classes have a special history with Spanish: they're "heritage learners," with a personal or familial connection to Spanish. They're typically US-born kids who hear Spanish at home and English everywhere else; although fluent in two languages, they've often been discouraged from using both.

"I was exposed to Spanish all my life, and I was always taught that there was a separation between Spanish and English," said Yesica Meza, a major in Spanish and international studies. "But as I would talk with other students who were also exposed to Spanish and English, that wasn't the case—we knew no separation. There was always that matter of if it was right or wrong for us to do that."

For students such as Meza, Holguín Mendoza and colleagues in 2011 launched the Spanish Heritage Language Program, which serves heritage learners and others with courses on heritage, Spanglish, bilingual communities, and the role of Spanish in the media, the US, and the world. The program just got a vote of confidence from the College of Arts and Sciences, which is supporting additional courses for students who want to improve their reading and speaking Spanish without taking upper-division language courses.

"Students are spreading the word and saying, 'You know, these Spanish classes are different, they don't penalize you if you don't speak standard Spanish,'" Holguín Mendoza said. "The goal is to make them aware of the richness of their culture and the skills they already possess. They should not feel embarrassed for speaking Spanish, and if they code-switch and someone looks at them, 'Well, that's the way I do it, this is being American.' If they just realize that, you are changing a life. You are changing a person."

With the program, Holguín Mendoza also hopes to reach non-Latino minorities and whites who appreciate the challenges facing minorities.

Helene Barkhuizen, a major in psychology and family and human services, places herself in that second group. With roots in South Africa, she said, "I get what it's like to have separate identities."

As an employee of Dutch Bros. Coffee, Barkhuizen enjoys switching to Spanish when serving Spanish-speaking customers—but occasionally, she has to switch back. She's starting to realize there's nothing wrong with that.

"I can hold a conversation with them in Spanish, but I will find myself speaking English, too—'Do you want a straw?'" Barkhuizen said. "(Holguín Mendoza) is showing us that it's okay to combine languages, to combine cultures, because that's the reality of the United States and our world, in general."

—MC

GET INTO THE GAME

VIDEO GAMES AS VEHICLE FOR LITERARY ANALYSIS

The lights were dimmed in a meeting room of Global Studies Hall on a recent Saturday night. It was quiet, a dozen people transfixed by the 10-by-10-foot projection screen on the wall. A pale-blue flickering glow illuminated their faces and a palpable tension filled the air.

A call to battle shattered the silence.

"Grab the flamethrower!"

The two players contorted, twisted, and grimaced as they used handheld controllers to guide characters to seize weapons and avoid getting fricasseed by foes in this video contest called *Duck Game*.

"Nooooo!" the group cried out in mock sympathy, as one player's duck met its untimely demise.

Welcome to Think.Play, a club that spends as much time discussing video games as playing them. But the members aren't trading tips on how to climb the ladder in *Donkey Kong*—instead, these students use video games to explore ideas about art, representation, narrative, and culture straight from the English department.

As video games continue to shape and reflect modern culture, the department is using the medium to introduce students to topics that apply to literature and culture—critical analysis, character development, and gender, among them.

Students started the group in 2011, not just to play video games, but also to interpret them academically. The English department took note, recognizing that the group was essentially breaking down video games as you would a classic text; the club is now affiliated with the English Undergraduate Organization and the department helps promote activities.

"The English department looks at film, they look at books," said senior Ana Lind, a digital arts major.

"Video games are just another one on that list."

Think.Play members explore mythology and other storytelling devices in video games, and how effectively these devices move the player through the action. Members analyze characters, storylines, and the extent to which the games reflect society or politics.

These are all skills that can be applied to most any literary topic.

During a recent session, Think.Play deconstructed *Fallout*, a popular game set in a postapocalyptic world.

in sociology. "Things that wouldn't change even in a world-altering event."

The group's members hail from disciplines as disparate as economics and music. Think.Play is also open to those who are simply interested in video games or work in the industry.

Tara Fickle, a faculty sponsor and an assistant professor in English, said that whether Think.Play is playing video games or discussing them, the outcome is the same: participants are energized.

Fickle teaches a course—New Media and Digital Culture: Games as Theory and

> " THE ENGLISH DEPARTMENT LOOKS AT FILM, THEY LOOK AT BOOKS. VIDEO GAMES ARE JUST ANOTHER ONE ON THAT LIST. "
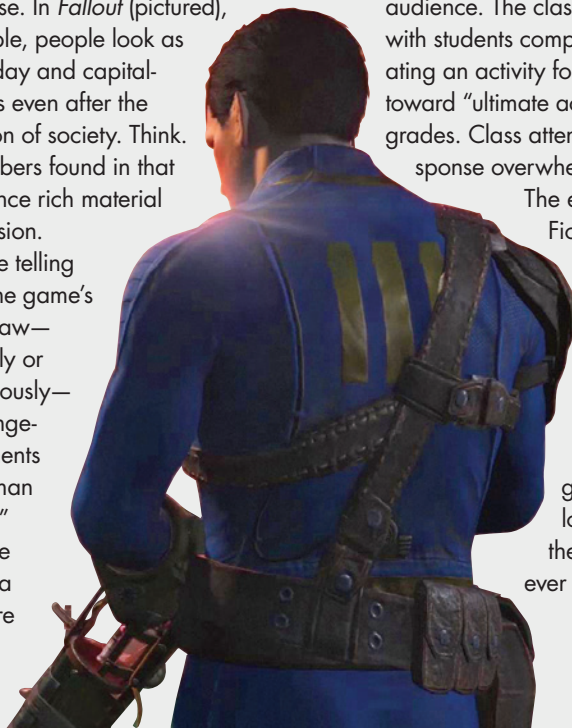
The group discussed the game's presentation of posthumanism, gender, and nuclear apocalypse. In *Fallout* (pictured), for example, people look as we do today and capitalism thrives even after the obliteration of society. Think.Play members found in that circumstance rich material for discussion.

"They're telling us what the game's creators saw—consciously or subconsciously—as unchangeable elements of the human condition," said Dante Douglas, a sophomore

Culture—on the cultural phenomenon of video games, including their purpose and audience. The class is designed as a game, with students completing "quests"—say, creating an activity for the class—to earn points toward "ultimate achievements," similar to grades. Class attendance is strong and response overwhelmingly positive.

The experience showed Fickle that video games can serve as an excellent tool for learning how to analyze a story—and that's as applicable to Faulkner as it is to *Fallout*.

Said Fickle: "We're giving students a way of looking at video games that they can transport to whatever text they are reading."

—JM

SHE WHO LAUGHS LAST

Video producer credits her success to humanities offerings

STOP US IF YOU'VE HEARD this one before: what do you get when you cross a flair for humor with Judaic studies, comparative literature, and creative writing?

A career in comedy, of course.

It's no joke—Lauren Greenhall '12 (Judaic studies, comparative literature) has produced shows for the New York Comedy Festival, a massive five-day celebration in the Big Apple. She's worked for Comedy Central's *Comedy Underground with Dave Attell*.

And her latest gig? Working with Neil Patrick Harris for NBC's *Best Time Ever with Neil Patrick Harris*, a modernized variety show that played off the Emmy

and Tony Award–winning performer's myriad skills.

Greenhall—now a video producer for *The Huffington Post*—would be the first to admit that her career path has been somewhat, to use her word, "scattered." But it's easy to see how the liberal arts ties it all together.

"People associate being a liberal arts major with someone who's lazy or unemployable," Greenhall said. "The longer I'm in production, it seems like some of the people come from (broadcast backgrounds) but the majority of them are people who are just obsessed with ideas."

Greenhall's experience in comparative literature was all about ideas, she said—as in, how far can you stretch one before it

breaks? Could she make a credible argument that, say, *Lawrence of Arabia* was really a commentary on sexual repression in the 1960s?

"(Comparative literature) is a great exercise in thinking outside of the box," Greenhall said. "You learn how to think creatively."

In her creative writing classes, Greenhall learned that "done is better than perfect"—that even if you aren't quite ready to share your work, sometimes it's better to put it out into the world and see what happens. "'Perfect' may never come," she said, "and you only truly get better at anything through constant hard work and grinding."

DISABLING THE STEREOTYPES

NEW PROGRAM DEBUNKS STIGMAS ASSOCIATED WITH PEOPLE WITH DISABILITIES

IF YOU GO TO REALITY KITCHEN and purchase a scone or one of its other pastries, chances are Jesse Egli is behind the tasty goodness you are about to enjoy.

Egli (opposite page) is a pastry chef at the full-service bakery and deli in Eugene, which employs people with developmental and intellectual disabilities.

He formerly worked another cooking job but found the pace too fast. A vocational rehabilitation agency referred Egli to Reality Kitchen more than a year ago, and it's been a perfect fit.

This spring, students from the University of Oregon will work with the employees at

Reality Kitchen, documenting their stories.

Egli and his peers will describe the challenges they've overcome, the confidence they've gained through holding a job, what it's like to live with a disability, and how they navigate in the working world. The class, which is funded by the Tom and Carol Williams Fund for Undergraduate Education, culminates with a student theater presentation on the experience.

The Life Stories: Wider Worlds seminar is part of a trailblazing new project, the Disability Studies Initiative. The program attacks the stigma associated with people with disabilities and helps students explore an issue that is complex and often misunderstood. The initiative also educates students

about disability-related careers in design, medicine, human services, and other professions.

The initiative features courses from across the university that address disabilities: literature, architecture, product design, political science, music, health policy, and others. Perhaps as soon as this fall, students will be able to work toward a minor or graduate specialization certificate through the initiative.

The class is also open to students and representatives from other community agencies

its root, and consider the whole of the verses, asking, "Is that really what that verse means?"

"You're really pushing against people and people are really helping you with your ideas," Greenhall said. "How do you communicate that something isn't working? How does someone communicate that to you? How do you 'workshop' an idea?

Greenhall practiced team dynamics in Judaic studies. In a biblical Hebrew course, for example, students work as a team to read and translate a text they've never seen before. They look up words in the lexicon, break each word down to

pose or curse or do weird things, but he is just so quick on his toes," Greenhall said. "His improv abilities are insane."

Greenhall also has a video interview with Seahawks football coach Pete Carroll to her credit, no small thing for this proud Seattleite. She focused on Carroll's inspiring approach to success in all areas of life, not just on the gridiron.

The hits just keep coming—literally.

HER EXPERIENCE IN COMPARATIVE LITERATURE WAS ALL ABOUT IDEAS—HOW FAR CAN YOU STRETCH BEFORE IT BREAKS?

"In my career, and in any career that focuses on teamwork and collaboration, having this background helps tremendously."

Working with Harris was a high-water mark of sorts for Greenhall's nascent career. Her job, in part, was to rehearse with the actor-comedian to get his own creative juices flowing. Playing the role of potential show participants, Greenhall would flub a line or act oddly, she said, to try to throw Harris off his game.

"You would mess up a word on pur-

One of Greenhall's latest projects for *The Huffington Post* was a Thanksgiving special: she produced a video on a vegan farm that celebrates by cooking up a huge meal for its turkeys—rather than cooking the turkeys themselves. At last glance, the video had been viewed more than 6.4 million times.

"I never thought my claim to Internet fame would involve a band of turkeys," Greenhall said. "But I'm pretty happy about it."

—MC

and programs, including Lane Education Service District and the Oregon Supported Living Program. The initiative also addresses physical disabilities and requires a minimum of 90 hours—and the option to accrue as many as 330 hours—of fieldwork with people with disabilities.

"Our program covers a much wider range of academic disciplines than any of the other programs (in the country)," said English

WHEELER WANTS GREATER AWARENESS OF PEOPLE WITH DISABILITIES AS A DISCRETE COMMUNITY THAT DESERVES A MORE INCLUSIVE PLACE IN SOCIETY.

professor Elizabeth Wheeler (opposite page), who leads the initiative. "We're aiming to be very outward-facing toward the community."

Wheeler has been instrumental in this effort. In her research, she studies how children and young adults with disabilities are portrayed in literature and the media, ranging from toddler's picture books to graphic novels and poetry slams. As someone with a

neurological condition, she relates deeply with the subject.

Wheeler is also in the process of writing *HandiLand: The Crippest Place on Earth*, a book on how literary depictions of youth with disabilities have evolved in recent decades, and how these characters are now taking leading roles in the narratives. She wants greater awareness of people with disabilities as a discrete community that deserves a more inclusive place in society.

"A disability isn't something that happens to a few marginalized people," Wheeler said. "This is their cultural heritage, their community. They have a voice and pride of place in the university."

—JM

STEPHEN COMBINES HER RESEARCH AND THE REFUGEES' STORIES INTO A POWERFUL PETITION FOR POLITICAL ASYLUM.

FREEDOM FIGHTER

Stricken by refugees' plight, anthropologist gets involved

Family traveling a road in San Sebastián, Huehuetenango, Guatemala

"CLAUDINA" WAS TWO years old when her father left Guatemala for work in the United States, and five when her mother left to join him.

For the next nine years, she endured emotional abuse at the hands of an aunt and uncle. She was raped by a relative and lived with the threat of sexual assault whenever she was alone outside.

She didn't trust the local police department, which was corrupted by gangs and organized crime. She felt abandoned.

With nothing to lose and desperate for a better life, Claudina fled Guatemala—unbeknownst to her parents—in an effort to rejoin them in the states. She was 14.

Claudina is one of the Guatemalan refugees that Lynn Stephen has helped to freedom in America.

Stephen, an anthropology professor and codirector of the UO Center for Latino/a and Latin American Studies explores the impact of globalization, migration, and nationalism on indigenous communities in the Americas, with an emphasis on gender and race.

Over the past eight years, she has served as an expert witness for more than two-dozen refugees from Mexico and Guatemala seeking political asylum through US courts. Three from Guatemala for whom she's provided extensive support have won their request, and nine additional cases are working their way through the judicial system.

Stephen came to the role through her research on challenges facing indigenous peoples in Central America. The more Stephen delved into the stories of the victimized there, the more she felt obligated to get involved.

Working with graduate students Darien Combs and Brenda Garcia, Stephen has conducted in-depth interviews with more than a dozen refugees seeking asylum here. Her team has documented the threats of violence, extortion, and torture that have led thousands of Guatemalans to head north—and the same abuses awaiting them should they be deported back to their homeland.

Stephen combines her research and the refugees' stories into a powerful petition for political asylum. Refugees then submit those "declarations" to the courts, with Stephen providing expert testimony in writing, and if requested, orally.

"My expertise as an anthropologist allows me to put this person's story in context, to say, 'This is consistent with what my research shows,'" she said. "Meanwhile, we are engaging as faculty—and engaging our students—in real-life human rights work."

Stephen sees parallels between the situations facing Guatemalan refugees and those of the Syrians trying to escape the violence in their homeland. Both groups have faced strong resistance to their plight and unwelcome receptions from certain quarters of society. This at a time when more people have been displaced from their native lands than during any other period in history.

"What's really frightening to think about is the Guatemalans who are coming now are bringing with them long histories of violence, and the war was officially over 20 years ago," Stephen said. "What I have learned watching refugees from the war in Central America is that violence doesn't end. The political part of the war might be over, but the

violence isn't. Some people talk about how it was safer for them during the war than now."

Such was the case with Claudina. As she approached the Mexican border with the US, she was kidnapped and beaten. Her captors freed her only after her father wired them $7,500.

Lynn Stephen

She eventually made her way into the country and in January 2015, Claudina was granted her petition for asylum; she now lives with her parents in the West. Others helped by Stephen have settled around the Northwest, and communities are emerging in Michigan and Florida as well.

"You can't beat the outcome, which is saving someone's life," Stephen said. "Being deported back to a situation of intense violence and persecution is often fatal. Obtaining political asylum allows people to abandon a lifetime of fear and begin to live their lives."

—JM

Evans and Evans and Economics

FATHER-SON TEAM KEEPS STUDY OF THE "MACROECONOMY" IN THE FAMILY

ECONOMICS PROFESSOR George Evans now sees a familiar face in weekly meetings with colleagues: his son, David Evans, a new assistant professor in the department.

The younger Evans joined the university last year, bringing expertise in macroeconomics, taxation, and computational economics.

"It's not often that sons or daughters follow as academics in the same field as one of their parents," said Bruce Blonigen, associate dean of social sciences and an economics professor. "It would be even more unusual that you'd have them in the same department."

In fact, there will be overlap for the Evans and Evans wing of UO economics. Both merge macroeconomics—which deals with the economy as a whole—and microeconomics, which is the study of individual behaviors such as spending and saving. Father and son are already working on a joint research project with Bruce McGough, an associate professor; the trio is looking at how people decide whether to accept a job offer, particularly if they are unemployed.

Those who *are* employed, meanwhile, often become the subject of George Evans' work. The John Hamacher Chair in Economics studies a question shared by everyone from low-wage earners to captains of industry: how much to save.

George Evans (top) has long examined how people make this decision, based on what they have seen from markets in the past and what they expect in the future. He has juxtaposed such decision-making with that by policymakers attempting to steer the economy.

In a recent paper, Evans found that people trying to balance expected returns and risk can actually trigger booms and busts of the stock market. "It's hard to decide on a level of savings," George Evans said, "not to mention how to invest the savings in different assets. And collective decisions about savings can have major effects on the economy."

In a similar vein, David Evans studies entrepreneurs and how they pick their investments, given market risks.

The younger Evans comes by way of the PhD program at New York

University, where he trained with one the world's leading economists—Thomas Sargent, regularly cited on macroeconomics and other topics. Sargent, who has also worked with George Evans, won a 2011 Nobel Prize for his research on cause and effect in the macroeconomy.

Sargent served as David Evans' advisor and held a weekly reading group that was invaluable for the aspiring academic. Each week, Evans and his peers summarized a research paper in concise presentations to Sargent and the rest of the group.

"Tom has produced some incredibly influential pieces of research that changed the field of economics," David Evans (above) said. "But he is also an incredibly influential mentor. Most prominent universities have professors who have been one of Tom's students; being one of Tom's students myself puts me in contact with this network of brilliant researchers."

David Evans also brings talent in using supercomputers to solve economic problems. Currently, he is exploring how the economy is affected by governments that suspend debt repayment.

"We've hit a wonderful point in time," David Evans said, "when our tool set is getting better."

George Evans has another son, but he's not on a track to join his dad and brother in economics at Oregon. Marc Evans is a graduate student in music composition at the University of California at Santa Barbara.

"He has a good intuitive sense about economics so I have occasionally said, 'You know, as a fallback, you might consider economics,'" George Evans said, laughing. "He hasn't shown any interest in that."

—DD

REVEALING THE
INVISIBLE ANIMAL

Creatures great and small deserve sociologists' attention

"FORTY YEARS AGO, THEY WEREN'T CONCERNED ABOUT POLLUTION OR EXTINCTIONS OF ANIMALS OR WATER RESOURCES."

YOU CAN LEARN a lot about economic development from a donkey.

Consider the move from farming to industrialization in South America and equatorial Africa. Neither region had indigenous domesticated animals suitable for plowing, so farmers had no reason to invent plows. Instead, for centuries, people farmed with digging sticks and hoes.

In South America, this changed when European invaders arrived—bringing their plows, donkeys, and other draft animals with them. Because the New World lacked diseases that would sicken the imported livestock, they thrived. This, in turn, made it possible to use plows and they were soon widely adopted.

In equatorial Africa, on the other hand, diseases like sleeping sickness made it difficult to keep Eurasian draft animals alive. Farmers had no choice but to continue with traditional digging sticks and hoes; it wasn't until the 20th century and the introduction of tractors that plow technology became widespread in the region.

The point, UO sociologist Richard York says, is that draft animals such as horses, cattle, and donkeys can tell us a lot about how a region grows.

York is urging his field to see animals in a new light—as living, breathing creatures that can profoundly influence the way civilizations develop, and that are, in turn, changed by their contact with humankind. It's a new approach that can be applied to many areas of sociology.

York outlined his ideas in "The Invisible Animal: Anthrozoology and Macrosociology," coauthored with Philip Mancus, PhD '09, a professor of psychology and sociology with College of the Redwoods. The paper received a 2013 distinguished scholarship award from the American Sociological Association.
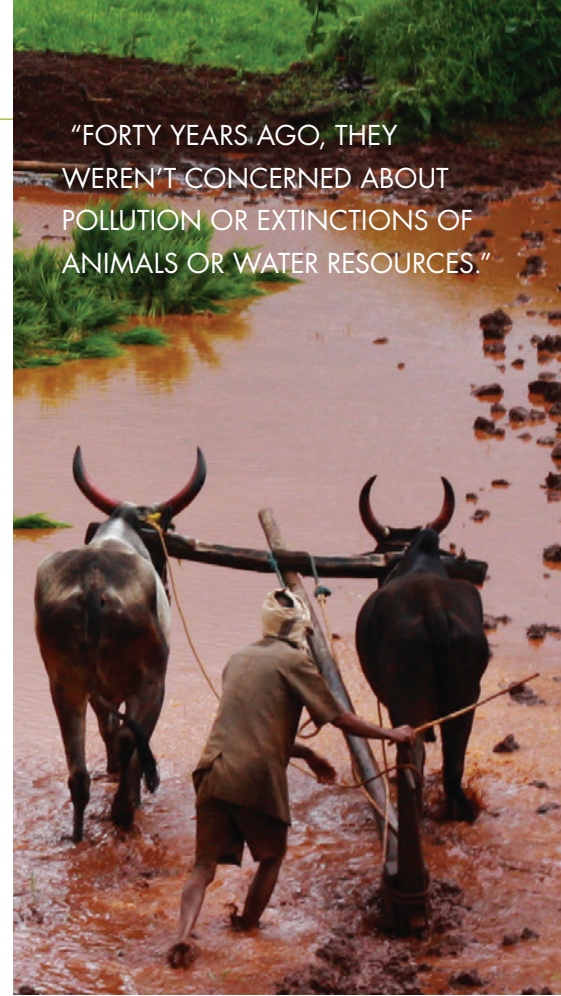
The association said it recognized the work because it encourages and supports the development of theory, research, and teaching about the complex relationships between humans and other animals.

"In the process, it is anticipated that the light we shed on these issues will increase the well-being of both humans and other animals," the association said, on its website.

That's certainly how York sees it—he's convinced that just about every area of sociology can benefit from bringing animals into the center of attention.

For York, fruitful areas for study include looking at societies' differing uses of humans, animals, and fossil fuels to power their technologies; the impact of animals in warfare over the centuries; and how today's factory farming can lead to the rapid spread of diseases like avian flu.

Bringing together disparate ideas to gain novel insights is nothing new for York. As a macrosociologist specializing in environmental sociology, he looks at the big picture of how societies affect their environments—a relatively new discipline within the field.

"Forty years ago, almost no sociologist would ever have asked, 'Why is it that some societies use so much fossil fuel and others don't?' They weren't concerned about pollution or extinctions of animals or water resources," York said. "A lot of my analysis shows what happens with economic growth, technological changes, how that actually influences the environment."

York has an abiding interest in the environment: as director of the Environmental Studies Program, he helps bring together faculty from natural sciences, social sciences, and humanities to examine the big questions that arise from the interaction of humans and their environments.

"Academia is often divided," York explained. "People who are philosophers don't necessarily regularly communicate with people who are geologists. Environmental studies gives us the opportunity to build connections across types of scholarship."

—KA

HERE SHE COMES

Beauty pageants provide Nigeria with entry to the global stage

Miss Anambra, Unoaku Anyadike, won the Most Beautiful Girl in Nigeria 2015 pageant.

BEAUTY PAGEANTS are big business in Nigeria. Travel the country and you'll find they're just about impossible to avoid. Newspapers and social media cover the pageants, and contest winners advertise cosmetics and promote other businesses, too.

When Oluwakemi "Kemi" Balogun first began studying Nigeria's pageants, she was struck by how many people paid attention to them.

"Even people who told me that they didn't care about these pageants had something to say about them," said Balogun, an assistant professor in sociology and women's and gender studies.

This level of national involvement would be remarkable anywhere. But it's especially significant in a country as diverse as Nigeria, which is home to two major religions and more than 250 ethnic groups.

The pageants do much more than simply entertain a nation, Balogun says. They unite Nigerians within a national identity.

Balogun, who joined the university in 2013, studies gender, globalization, nationalism, race, and migration.

In her research on two pageants—Queen Nigeria and Most Beautiful Girl in Nigeria—Balogun shows distinctive but complementary visions of ideal Nigerian womanhood.

Queen Nigeria, designed specifically to

> IF "QUEEN NIGERIA" IS AN AMPED-UP VERSION OF THE GIRL NEXT DOOR, "MOST BEAUTIFUL GIRL IN NIGERIA" IS HER UNTOUCHABLY GLAMOROUS SISTER.

appeal to a Nigerian audience, represents the domestic version of the nation's ideal woman. Pageant participants are aspirational yet approachable—they're easy for their fellow citizens to relate to.

These competitors blend modern sensibilities—they're typically college-educated—with respect for tradition. Nigerian standards of modesty prevail: there's no swimsuit event and skimpy outfits are discouraged. A cooking competition gives contestants the chance to show off their culinary skills by shopping for and preparing a regional dish.

If Queen Nigeria is an amped-up version of the girl next door, Most Beautiful Girl in Nigeria is her untouchably glamorous sister.

Don't expect any cooking competitions here. A contestant in Most Beautiful Girl in Nigeria is a fashion-forward woman groomed to take her place in the country's most elite echelons, and beyond.

In contrast to the demure mores of Queen Nigeria, participants are encouraged to wear body-revealing outfits and the swim-

suit competition is a central element. In fact, during initial screening sessions, contestants model bikinis so judges can inspect them for scars and other physical imperfections that would make them less competitive in international pageants.

Winning Most Beautiful Girl in Nigeria is an honor, of course. But what makes it truly significant is its role as a pipeline to the global competitions. The top five contestants go on to events in Africa and abroad; the first runner-up competes in the Miss Universe contest, and the winner represents her country in Miss World.

Given the stakes, pageant judges aren't focused on women who will appeal just to Nigerians. Instead, they want someone who has what it takes to "wow" at the international level.

To give contestants an extra edge, experts from the United States and South Africa provide coaching on grooming, catwalk poise, and more.

Although the pageant's emphasis on international standards of beauty makes some uncomfortable, Balogun says it's important for Nigerian women to represent their nation in this manner. It's a way for the country—one of the world's largest oil suppliers—to share the global stage with leading nations.
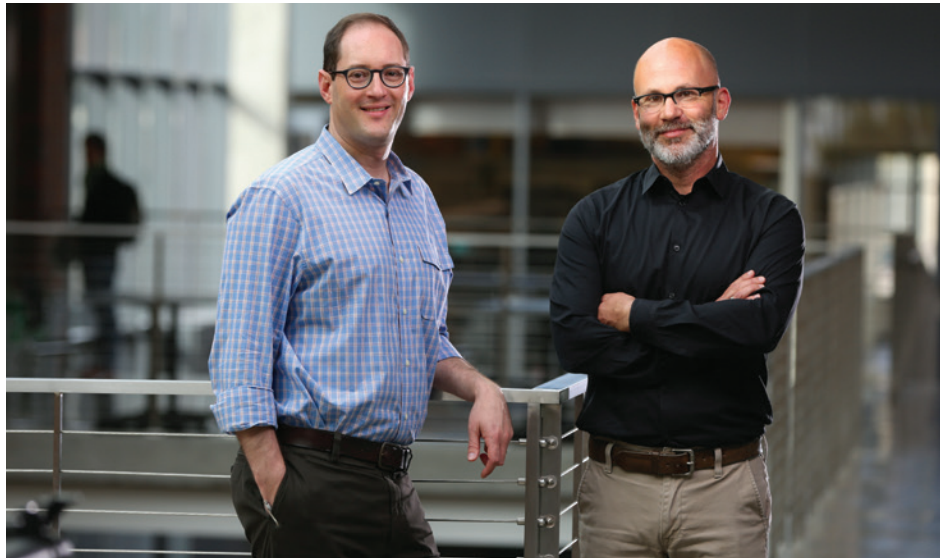
Balogun is currently working on a book that expands on her work with Queen Nigeria and Most Beautiful Girl in Nigeria, while considering other pageants as well.

"Pageants tell a really interesting story about what's going on in Nigeria today," Balogun said, "as well as the major transitions of the past 50 years."

—KA

BRAIN TRUST

BETTER LIVING THROUGH NEUROSCIENCE

Berkman (left) and Fisher have created a center that will move nimbly, pursuing many smaller-scale projects rather than a single undertaking that would take years to complete.

IT'S NO SECRET that childhood experiences can affect us well into adulthood.

Children who grow up in chaotic and unstable settings often struggle in school. They're more likely to battle depression and addiction than others.

In fact, our experiences determine how our brains develop. Consider compulsive overeaters: the brains of those with this disorder have developed in unusual ways—there are actually different structures in some areas of the brain.

But the path of brain development isn't set in stone in childhood. Brains can—and do—change throughout a lifetime. New

neural circuits—the tiny electrical pathways that carry information across this organ—can form throughout childhood, into adolescence, and even well into adulthood.

With the right tools, it's possible to build new pathways that can help people improve their lives.

A new UO research center is creating a roadmap of this cerebral superhighway, and it will provide training on how to re-route neural patterns to steer us to healthier decisions. The goal? Enabling people to short-circuit behaviors like addiction and aggression, developing innovative approaches to treating and preventing health and mental health problems, and inform-

ing public policy and programming.

The Center for Translational Neuroscience will translate knowledge about brain structure and function into practical tools for improving well-being.

Led by Phil Fisher, a psychology professor and Philip H. Knight Chair, the center unites researchers from neuroscience, psychology, education, and other disciplines. This cross-disciplinary mix is essential, Fisher says, because the knowledge in these fields is expanding rapidly.

"To really move the needle in any of these areas," Fisher said, "you need people who are both really deep experts in their particular disciplines and who also find

CONTROL YOURSELF

A social psychologist explores our ups and downs with self-control

SELF-CONTROL IS ONE behavior that social psychologist Elliot Berkman has examined to great academic and social benefit.

Berkman studies the cognitive and neural factors in the brain that contribute to our success or failure. In one popular study, he and his partners showed that text-messaging is an effective way to curb smoking.

Or consider poverty. One school of thought holds that the poor are responsible for their plight because they lack self-control.

But Berkman has illustrated the powerful ways that poverty harms people. In a

recent column on the social and psychological challenges posed to the poor, Berkman noted that poverty can force one to choose a dire, immediate need—like food—over saving money for the future.

Why Berkman's interest in self-control?

"Self-control and long-term planning set us apart from other animals," Berkman said. "Some people consider pursuing meaningful life goals to be the hallmark of human experience. But we're sometimes so bad at it! The tension between wanting to be good at these things and struggling with them is a nearly universal experience. That's fascinating."

—KA

it enriching and compelling to engage in the kind of cultural exchange the center fosters."

The center will assess strategies used to encourage healthy behaviors—say, improving the feel of visitation rooms where biological parents meet and bond with their children placed in foster care.

In one project, Elliot Berkman, a social psychologist and the center's associate director, is trying to make a difference for teenagers with histories of drug use or unsafe sex.

Working from a pool of at-risk teens, Berkman has created two groups: those who grew up in stressful, unstable settings, and those who didn't. He will run both groups through brief training sessions on a computer; the sessions are short games in which the user must stop rapidly pressing a button in response to a cue—a challenging task that requires self-control.

In some cases, the teen will see a picture of a peer during the session; in others, a neutral object such as a chair. Unbeknownst to the participants, they're more likely to exhibit self-control or restraint when there are pictures of peers on the screen rather than neutral objects. Berkman's hypothesis is that simply introducing the image of a peer at that critical moment when a teen is practicing self-control can improve the functioning of areas in the brain that manage impulse control in the moments when teens make their riskiest decisions: with peers.

Berkman is studying whether the training will affect the neural circuitry of the teens in both groups similarly, or if one group will experience greater changes. His team will review MRI brain images taken before and after the trainings to answer research questions.

Along with helping people in the community, the center will help students in the classroom. Plans call for training available at every level, from undergraduates to those pursuing postdoctoral work.

"What we'll be studying in the next 10 or 15 years will probably be something that hasn't occurred to anyone yet," Berkman said. "We need to give students the skills to go out into those fields and become effective collaborators."

—KA

SHAKE, RATTLE, AND ROLL

GEOLOGISTS HELP NW GET AHEAD OF "THE BIG ONE"

Cadillac Hotel, damaged in Nisqually earthquake near Seattle in 2001

WHEN A MAJOR earthquake was on the verge of rupturing just north of San Francisco in August 2014, the city was alerted nine seconds in advance.

That might not seem like much time, but it's more than enough for automatic systems to stop commuter trains and elevators, open firehouse doors, or alert a doctor to cease a delicate surgery. That's the benefit of an "earthquake early warning system," a project proposed for the Northwest and one that is gaining steam, a result of efforts of UO geologists and their colleagues at universities in Washington and California.

The federal government has set aside $5 million to bolster a prototype called "ShakeAlert," including the construction and upgrading of about 150 seismic sensors to improve the speed and reliability of warnings. Then last fall, more than 40 House and Senate lawmakers came together to urge the president to put $16 million annually into the budget of the US Geological Survey to bring the system closer to reality (the capital cost is roughly $40 million).

Professor Doug Toomey and Assistant Professor Amanda Thomas are helping lead the project (visit www.socc.edu/geology to click to a video lecture by Toomey on the issue).

Toomey and other university officials were in Washington, DC, recently to attend a White House event on earthquake early warning systems. Meanwhile, the Eugene Water and Electric Board—the largest public electric and water utility in Oregon—is working with the UO to place four seismic sensors on its hydroelectric facilities, canals, and water treatment plant.

It's trite but true: during an earthquake, every second counts. When triggered by the first vibrations from a temblor, an early warning system can send an alert at the speed of light—outrunning a quake's slow-moving "S-waves," which do the real damage.

A fully operational system, experts say, could provide critical minutes of advance warning.

"Earthquake early warning systems can really help with decreasing injuries and saving lives," Toomey said. "Given a minute of warning or so, people would already be in a secure spot when the quake hits, and because of that they would get hit by less debris."

Other members of the UO's geological sciences department are part of the effort to help the region prepare for the catastrophic earthquake expected in the future: Becky Dorsey, department head, recently spearheaded a public forum in Eugene with Toomey, Thomas and Ray Weldon, another department geologist. Emilie Hooft, an associate professor, has been involved as well, and the UO team also includes researchers Leland O'Driscoll and Dennis Fletcher.
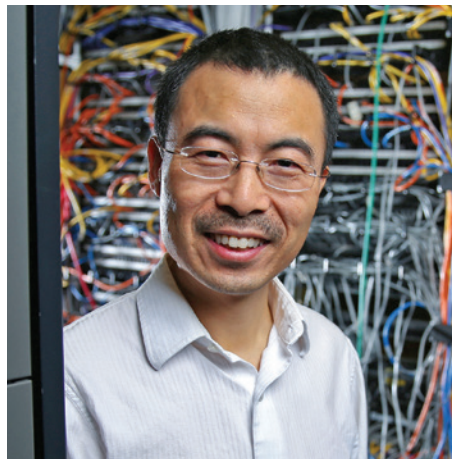
—MC

FIRST LINE OF DEFENSE

NEW CYBERSECURITY CENTER WILL HOST RESEARCH THAT CARRIES FEDERAL STAMP OF APPROVAL

N COMPUTER CIRCLES, a cyberattack known as a "distributed denial of service" is the equivalent of a nuclear bomb.

During this assault, hackers take over computers—even millions of them—and use them to overwhelm one system with a blast of information, wiping out the victim's connection to the Internet. This attack can cripple most websites; in 2007 it was used to shut down connections to the entire country of Estonia.

The so-called DDoS has been a significant problem for more than a decade, and it's one that Jun Li is committed to defeating. Li, a professor of computer and information science who specializes in Internet security issues, now has a national stamp of approval for this work.

Thanks to the efforts of Li and his colleagues, the university recently landed a

from business, law, philosophy, and computer and information science to tackle the ever-changing world of online security and privacy issues.

As the director of the center, Li (top, right) will continue to investigate DDoS attacks in work supported by the US

issues related to information technology and privacy.

- **Ben Yang**, an associate professor in the Charles H. Lundquist College of Business, who is examining the problems posed by the Internet for consumer privacy protection.
- **Xiaodi Wu**, an assistant professor in computer and information science, who is investigating the potential impact of quantum computers on security issues.
- **Dejing Dou** and **Reza Rejaie**, also from the Department of Computer and Information Science, who are exploring social network privacy concerns.

The stakes are high because anyone who goes online for anything—an e-mail, a video call, a web search—is vulnerable to attack.

Simply put, Li said, "This is a problem that you have to address."

The computer and information science department is well-represented at the center, of course: Michel Kinsy, Boyana Norris, Zena Ariola, and Allen Malony are investigating computer hardware and software vulnerabilities.

Assistant Professor Daniel Lowd, another member of the CIS faculty at the center, is also studying an issue that—while unrelated to the center—addresses the Internet's susceptibility to abuse. He wants to develop a way to zap spam on social networks and fake reviews on websites.

> THE STAKES ARE HIGH BECAUSE ANYONE WHO GOES ONLINE FOR ANYTHING—AN E-MAIL, A VIDEO CALL, A WEB SEARCH—IS VULNERABLE TO ATTACK.

federal designation as a National Center of Academic Excellence in Information Assurance/Cyberdefense.

Oregon is the only school in the state—and one of just 60 nationwide—carrying the designation, which validates the UO's advanced research in cyberdefense. The recognition will help the university draw additional research funding, faculty, and high-caliber students.

Li has also been working with colleagues to create a space where the university's best minds on Internet security can collaborate: the Center for Cybersecurity and Privacy, launched in 2015, brings together faculty

Department of Homeland Security.

But the true strength of the center is its interdisciplinary nature. Members from across the university will concentrate on web privacy, hardware and program security, legal issues of life online, and "quantum cryptography"—that's the use of physics to cloak messages in a formidable shield of encryption.

Center members include:

- **Colin Koopman**, an associate professor of philosophy, who is exploring privacy issues.
- **Eric Priest** and **Carrie Leonetti**, both from the School of Law, who are studying legal

Lowd won an Army Research Office Young Investigator Award, which provides $360,000 over three years for his project. He recognizes that the people behind spam and fake reviews are constantly changing their techniques, so he must create defenses that are just as agile.

Said Lowd: "I'm trying to develop methods that are general enough that you can apply them to detect both social network spam and fake reviews." —DD

THE HIGHEST HONOR

Chemist Geri Richmond wins the National Medal of Science

GERI RICHMOND has long used her prominence as one of the world's top chemists to advocate for women scientists everywhere. She—and they—just got a big lift in this effort.

Richmond has been awarded the National Medal of Science, the highest honor given by the US government to scientists, engineers, and inventors. The news from the White House reached Richmond as she was getting ready to depart from Washington, DC, late last year; Richmond was so humbled and elated, she said, "I almost couldn't board the plane."

President Obama called the work by Richmond and the other eight recipients "a testament to American ingenuity."

"Science and technology are fundamental to solving some of our nation's biggest challenges," the president said. "The knowledge produced by these Americans today will carry our country's legacy of innovation forward and continue to help countless others around the world."

Serving as the UO's Presidential Chair in Science since 2013, Richmond studies molecular structures and interactions at surfaces—such as those of water or glass—seeking to understand the most fundamental interactions underlying many environmental, chemical, and biological processes. Isiah Warner, a top chemist and vice president at Louisiana State University, calls her "one of the top five in the world" in her field.

But science alone has never been enough for Richmond. She is the founding chairperson of the Committee on the Advancement of Women Chemists, which is committed to increasing scientific success and leadership among women scientists and engineers.

Under Richmond's guidance, the committee has conducted professional trainings and programs for more than 15,000 female researchers, faculty members, graduate students, and postdoctoral associates across the country. The committee has expanded to all areas of science and engineering, and has extended its geographic reach internationally, including developing countries in Africa, Asia, and Latin America.

Richmond said the award honors the graduate and postdoctoral students in her lab and also her "career-long passion" to be both a leader in research and in helping to strengthen the scientific enterprise in the United States and around the world.

Also, she added, "The recognition provides a strong message that women can be as successful as men in scientific research endeavors. Hopefully it will encourage other younger women to work toward similar success."

Other recipients of this year's award hail from Harvard Medical School, Princeton University, Stanford University, the Massachusetts Institute of Technology, Rensselaer Polytechnic Institute, University of Washington, and University of California at Berkeley.

Andrew Marcus, Interim Tykeson Dean of Arts and Sciences, praised Richmond's teaching, research, and public service as a shining example of all that the UO aspires to as a liberal arts institution.

"Her intelligence, drive, and vision have led to significant advances in our understanding of the feature that supports life on earth—water," Marcus said. "At the same time, she is training the next generation to make discoveries that go beyond what we can imagine. And her commitment to equity and fairness and her years of hard work have made a major difference to the engagement of young women in science here at UO, across the US, and around the world."

Richmond, who is completing her one-year term as president of the American Association for the Advancement of Science, also serves as a US science envoy in Southeast Asia. She is a member of the National Science Board and fellow of the American Academy of Arts and Sciences, and a member of the National Academy of Sciences. She joins UO psychologist Michael Posner, who won the National Medal of Science in 2008.

—MC

TODD COOPER–EUGENE WEEKLY

1) This Thanksgiving Idea Is No Turkey. New York-based Farm Sanctuary, which fights cruelty to farm animals and promotes vegan living, hosts an annual "Celebration for the Turkeys," at which the big-bodied birds are treated to a scrumptious feast—rather than being the feast themselves. Video producer Lauren Greenhall, BA '12 (p. 18), coproduced a video about the event that, at last check, had more than 6.4 million views on Facebook. Watch it at **cascade.uoregon.edu**.

2) Think Again. In her book *Infinite Awareness: The Awakening of a Scientific Mind*, neuroscientist Marjorie Woollacott pairs her research as a neuroscientist with self-revelations about the mind's spiritual power. Visit the Online Extras section at **cascade.uoregon.edu** to see a lecture in which Woollacott moves between the scientific and spiritual worlds, breaking open the definition of human consciousness to investigate the existence of a nonphysical and infinitely powerful mind.

3) A Bold Peace. Sociologist Michael Dreiling explores Costa Rica's national policy of demilitarization and its investment in people and the environment in *A Bold Peace: Costa Rica's Path of Demilitarization*, a documentary that he coproduced. The film draws pointed parallels and contrasts with US debates over the national debt, health care, the environment, and the escalating cost of the military. Watch for a screening on campus this spring; visit **cascade.uoregon.edu** to view the trailer.

Visit Online Extras at
cascade.uoregon.edu

CASCADE

Cascade is the alumni magazine for the UO College of Arts and Sciences

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UNIVERSITY OF OREGON

Remembering a geographer, a writing professor, and an English alum

The loss of a loved one often comes too soon. So it was with the abrupt passing of three from the College of Arts and Sciences late last year, leaving the university in mourning and remembrance.

In November, the university lost geography professor **Susan Hardwick** at age 70, after a brief illness. She joined the department in 2000 and became a national leader in geography education. Even after retiring in 2010, she continued to teach two courses each year, mentor graduate students and future teachers, and serve as codirector of the UO's summer graduate program in geographic education.

Hardwick played a critical role in crafting the original and revised versions of the National Geography Standards and cohosted the hugely successful PBS-Annenberg series, *The Power of Place*. She also spearheaded the development of an online training program for teachers of AP Human Geography, and played a central role in bringing to fruition the Road Map Project for the large-scale improvement of K–12 geography education.

In recognition of her extraordinary service and leadership in advancing geography education, Hardwick was honored in 2013 with the George J. Miller Award for Distinguished Service to Geographic Education, the highest award given by the National Council for Geographic Education.

"It is hard to name any major development in geography education over the past few decades that does not in some way bear Susan's imprint," said her colleague Alec Murphy, professor of geography and the James F. and Shirley K. Rippey Chair in Liberal Arts and Sciences. "She was a tireless and effective champion of the cause."

Also in November, the university grieved the death of creative writing professor **Ehud Havazelet** at age 60.

Havazelet, who joined the UO faculty in 1999 to teach fiction, was a two-time Oregon Book Award winner—in 1999, for his short-story collection, *Like Never Before*, and again in 2008 for his novel, *Bearing the Body*.

His work was also nationally acclaimed, with honors such as the Guggenheim Fellowship, Rockefeller Fellowship, Whiting Writers Award, and Pushcart Prize. Two of his books were named *New York Times* Notables and his story "Gurov in Manhattan" was included in *The Best American Short Stories 2011*.

Havazelet was diagnosed with leukemia in 2002 and received a bone marrow transplant, living with the aftermath of cancer treatment until his death from complications of pneumonia.
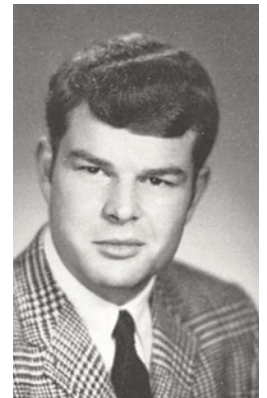
"Ehud was an engrossing and demanding teacher, who loved being in the classroom and attended to every aspect of writing from the comma to the cosmic," said Karen Ford, associate dean of humanities and professor of English. "He could make a discussion of sentence mechanics riveting and an explication of a Flannery O'Connor story transforming."

A memorial will be held at 2 p.m. March 12 in the Knight Library Browsing Room.

In October, **Lawrence Peter Levine**, who earned two English degrees here, was killed in a shooting at Umpqua Community College.

Levine, 67, was an assistant professor of English at UCC, which allowed him to share his passion for writing with others. He was a writer first and foremost, according to an obituary in *The Oregonian*, and he completed numerous novels—including a mystery set in the Northwest called *Timber Town*—but none was published.

Born in Manhattan, Levine grew up in Beverly Hills and, after graduating from high school, moved to Oregon. He moved back to California in the mid-1970s but returned to Oregon and joined UCC a few years ago, where teaching was a secondary occupation to his work as a fly-fishing guide, the newspaper reported.

At the UO, Levine received a bachelor's degree in 1969 and, in 1972, a master of fine arts in creative writing. Though his novels were never published, Levine's rich contribution to the university community is preserved in his MFA thesis, "Collected Works: 1969–1972," available in Knight Library.

—MC

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