

# illumiNation

VOLUME ONE // 2016-2017

Virginia Tech College of Liberal Arts and Human Sciences



*creativity +  
innovation*

*How can they be nurtured?*

# Contents



## SPECIAL REPORT *creativity + innovation*

- 12 Creative Genius**  
Virginia Tech professors reveal secrets for nurturing their students' imagination and ingenuity.
- 20 The Innovation Imperative**  
Innovation is more than synonymous with creative technologies and artistic imagination; it is also a national necessity. *by Matthew Wisnioski*
- 24 Living the Dream**  
The best inspiration for students hoping for creative careers? Alumni who are walking the walk.
- 48 The Alchemy of Creative Risk**  
A celebrated tech leader lauds the roles of art and risk in innovation. *by Michael Stowe*

## features

- 30 The Giving Spirit**  
An entrepreneur takes his university's service ideals to the streets of Los Angeles to comfort the homeless. *by Paula Byron*
- 34 Drawing the Line**  
How can you quash school bullying? Engage witnesses as peacekeeping forces—with a little help from the Cartoon Network. *by Paula Byron*
- 38 Why We're Here**  
As she looks to her future, a newly admitted student reflects on her family's past. *by Sarah Benson*

## departments

From the Dean.....	2
In Brief.....	3
Class Acts.....	9
History Repeating.....	40
Great Expectations.....	42
Hokie Tracks.....	44
Word of Honors.....	46



## 14

**STRIKE UP THE BAND:** How can you conduct an orchestra without musical instruments? Just gather up laptops, wooden salad bowls, and a band of fearless innovators.



## 24

**HOUSE STYLE:** Kelsy Dominick was raised in a tradition of crafts artists and entrepreneurs, so forging her own fashion brand seemed like a good fit.



## 48

**DISRUPTIVE BY DESIGN:** "What we choose to endeavor to do becomes the future," Facebook executive Regina Dugan said in urging boldness in the quest for innovation.

# The Shape of Our Future



I AM PLEASED TO SHARE THE 2016–2017 issue of our college's new magazine, *Illumination*. The format is designed to capture the vitality, creativity, and commitment that define our faculty, students, alumni, and programs. We had difficulty picking which stories to highlight because the theme for this inaugural issue—

creativity and innovation—is so integral to the learning enterprise at the college. For every story we were able to include, there were five more we wanted to tell.

This has been a vibrant year for the college. In the fall of 2016, we welcomed 556 first-year students, and more than 20 new faculty members joined us at the Blacksburg, Roanoke, and Falls Church campuses. Both of these groups are among the most qualified and diverse ever. Our departments have been developing exciting and relevant programs and majors in such areas as National Security, Fashion Merchandising and Design, Sports Media and Analytics, and Creative Technologies in Music.

Last year, I described the “VT-shaped learning” that I saw defining the interplay between liberal education and technological expertise at Virginia Tech. I am pleased that this concept has since become part of Beyond Boundaries, the university's visioning initiative, as we renew our mission to educating students in ways that bring together deep in-field knowledge, cross-disciplinary reach, experiential learning, and service commitments. As you will see throughout this issue, VT-shaped learning captures the true spirit of Virginia Tech education and the Hokies who embody it.

I hope you enjoy the stories of our community. I also invite you to visit the college, both in person and online at our new website—[liberalarts.vt.edu](http://liberalarts.vt.edu)—to learn more about what is happening on campus and across the Hokie Nation.

Elizabeth Spiller  
Dean, College of Liberal Arts and Human Sciences

### Illumination

An annual publication of the Virginia Tech  
College of Liberal Arts and Human Sciences  
Volume One, 2016–2017

#### Editor

Paula Byron

#### Art Director

Laura McFadden

#### Graphic Designer

Amanda Robinson '17

#### Contributing Writers

Sarah Bennett '20, John Pastor,  
Jimmy Robertson, Michael Stowe,  
Kaitlen Whitt MFA '17, Matthew Wisnioski

#### DEAN

Elizabeth Spiller

#### ASSOCIATE DEANS

E. Thomas Ewing  
Brian Shabanowitz  
Robert Stephens  
Debra Stoudt

#### DEPARTMENTS AND SCHOOLS

Apparel, Housing, and  
Resource Management  
ASPECT (Alliance for Social, Political,  
Ethical, and Cultural Thought)  
Communication  
English  
Foreign Languages and Literatures  
History  
Human Development  
Philosophy  
Political Science  
Religion and Culture  
ROTC (Air Force, Army, and Naval)  
School of Education  
School of Performing Arts  
(Music, Theatre/Cinema)  
Science and Technology in Society  
Sociology

#### College of Liberal Arts and Human Sciences

Virginia Tech  
Wallace Hall, Suite 260  
295 West Campus Drive  
Blacksburg, VA 24061  
540-232-8574 • [liberalarts@vt.edu](http://liberalarts@vt.edu)  
[liberalarts.vt.edu](http://liberalarts.vt.edu)  
f @VT\_LiberalArts  
t @VT\_LiberalArts

*Virginia Tech does not discriminate against employees, students, or applicants on the basis of age, color, disability, gender, gender identity, gender expression, national origin, political affiliation, race, religion, sexual orientation, genetic information, or veteran status; or otherwise discriminate against employees or applicants who inquire about, discuss, or disclose their compensation or the compensation of other employees, or applicants; or any other basis protected by law. For inquiries regarding nondiscrimination policies, contact the executive director for Equity and Access at 540-231-8771 or Virginia Tech, North End Center, Suite 2300 (0318), 300 Turner Street, NW, Blacksburg, VA 24061.*

# In Brief

*Around the Drillfield (and Beyond)*

## A LEGEND RETURNS

**BILL ROTH, FORMER AND** legendary Voice of the Hokies, has returned to Virginia Tech, this time as a professor of practice in the Department of Communication.

For 27 years, Roth provided radio play-by-play for Virginia Tech football and men's basketball. During that time, the National Sportswriters and Sportscasters Association named him the state's Sportscaster of the Year an unprecedented 11 times, and he was inducted into the Virginia Sports Hall of Fame in 2013. His jubilant call when Hokies crossed the endzone—"Touchdown Tech!"—became iconic.

Throughout his time at Virginia Tech, Roth worked for IMG, the multimedia rights holder for Virginia Tech sports. In 2015, Roth transferred to another IMG powerhouse, the UCLA Bruins. Yet the draw of the Hokie Nation—and the opportunity to expand the university's offerings in sports media and analytics—proved too great.

"Virginia Tech's future is so bright—not just on the fields and the courts, but throughout the commonwealth, academically, culturally, and institutionally," Roth says. "I'm looking forward to instilling in students the passion and energy I bring to the broadcasting booth. And I'm excited to be home!"



**TOUCHDOWN, TECH:** Recruiting Bill Roth to its faculty was a major score for the university.



**CHILD'S PLAY:** As part of earning her human development degree in 2016, Carneshia Johnson did field study work in the Child Development Center for Learning and Research.

## Life Lessons

*USA Today* has ranked Virginia Tech as the nation's second best for pursuing a major in human development and family studies.

The university's human development major focuses on child and adolescent development, adult development and aging, disabilities studies, human services, and family studies.

"Our program emphasizes the knowledge and skills that make a difference in people's lives," says Anisa Zvonkovic, head of the Department of Human Development. "We apply science to daily living, to help people thrive. Rather than focusing on their limitations, we help them achieve the best lives possible."

The program focuses on experiential learning, especially in four Virginia Tech centers that serve as living laboratories: Adult Day Services, the Child Development Center for Learning and Research, and the Family Therapy Center, all in Blacksburg, and the Center for Family Services, in Falls Church, Virginia.

"Hands-on learning helps students figure out what careers will make them happy," Zvonkovic says. "Our students also gain valuable experiences through internships and field studies at schools, community services agencies, nonprofit organizations, and research centers."

The human development program has long held a national reputation for excellence. Last year, *USA Today* named it first in the country.

"Human development makes a huge difference across the entire human lifespan," Zvonkovic says. "It emphasizes the value of nurturing another generation, whether an earlier one or a later one. It also focuses on discovering the best strategies for helping people in the context of their age, abilities, and living environments. Through their learning and research, our students demonstrate the university's motto, *Ut Prosim* (That I May Serve), and they go on to make Virginia Tech proud."

## O PIONEERS!

THE FIRST AFRICAN AMERICAN WOMEN to attend Virginia Tech arrived on campus in 1966. Fifty years later, their legacy was celebrated during the 2016 Black Alumni Reunion in April. Three of those students are now alumnae of the College of Liberal Arts and Human Sciences.

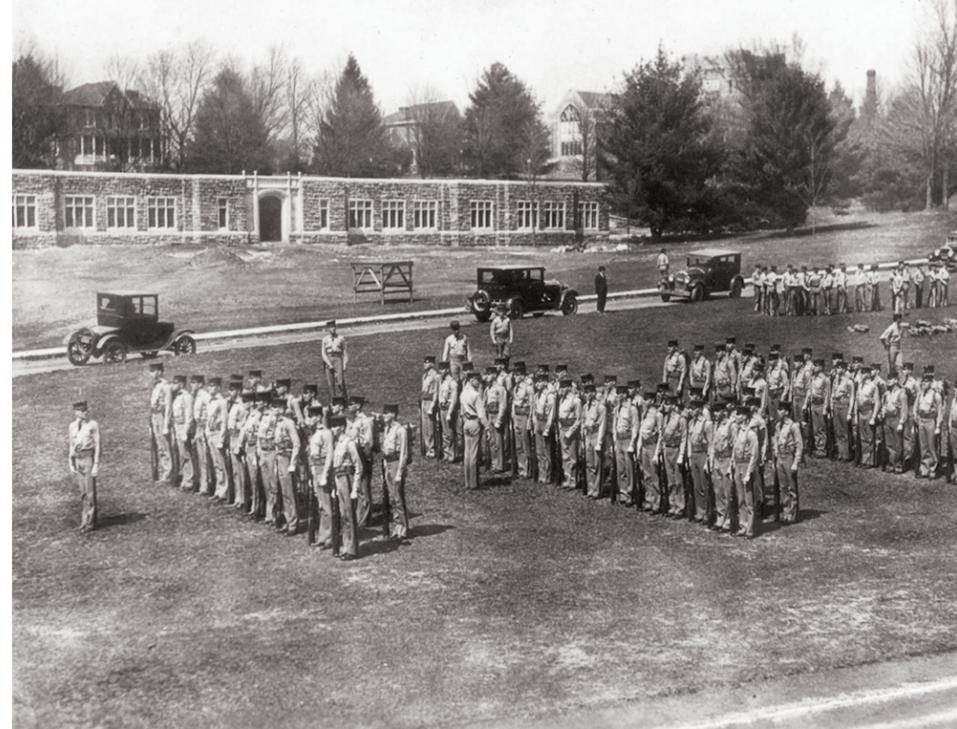
Jacquelyn Butler Blackwell (sociology '69), who graduated in only three years, held training positions at the Virginia Employment Commission before devoting herself to volunteer work.

Linda Edmonds Turner (clothing, textiles, and related art '70) went on to complete an MBA and a doctorate in business at Virginia Tech, a master's degree from Michigan State University, and a post-doctoral fellowship in higher education administration at Harvard University. She held two college presidencies and executive positions at three Fortune 500 companies. In 2015, she was named director of the Massachusetts Department of Industrial Accidents.

Marguerite Harper Scott (history '70), who received her master's degree in liberal studies from Duke University, first taught in Norfolk, Virginia, where she chaired the social studies department at Maury High School. She then taught civics, history, and sociology in public schools in Wake County, North Carolina. She also served as an adjunct professor at North Carolina State University.



**LEADING LADIES:** The first African American women at Virginia Tech included, clockwise from top left, Marguerite Harper Scott, Jacquelyn Butler Blackwell, and Linda Edmonds Turner.



**STANDING AT ATTENTION:** Cadets undergo inspection on the Drillfield in front of Patton Hall in 1926. At the time, Patton Hall had only one floor; additional stories were added several years later.

## A Century of Service

In September, Virginia Tech began a several-month-long commemoration of the centennial of its Army Reserve Officers' Training Corps (ROTC) program with a cake-cutting event held for alumni on Military Appreciation Day and Corps Homecoming. Another centennial celebration is planned for January 2017.

The university was one of the first to form an Army ROTC program, so its centennial follows that of the national program by just a few months.

Since 1916, the ROTC's charge has been to select and commission officers into the U.S. Army and to provide leadership development opportunities. When the university opened as the Virginia Agricultural and Mechanical College in 1872, all 132 students were cadets organized into a battalion of two companies. Participation in the Corps of Cadets would continue to be mandatory until 1964.

As World War I approached, President Woodrow Wilson established the national ROTC as part of the National Defense Act of 1916. Although military training had taken place in civilian colleges and

universities as early as 1819, the signing of the act brought the training under a single, federally controlled entity.

The Virginia Tech Board of Visitors approved the university's first ROTC program on November 23, 1916. Virginia Tech's Army ROTC received its federal charter less than a month later, on December 21. The ROTC Infantry unit was established January 5, 1917, followed shortly by Engineer and Coast Artillery.

The Air Force ROTC started in 1946. The Naval ROTC, which includes the Marine Corps, began in 1983.

"The ability of the Army to deploy anywhere to assist with humanitarian, peacekeeping, and combat missions—often all at the same time—is one of the reasons that inspired me to pursue this path," says Cadet Greg Milhiser '17, an international studies major. "The most significant aspect of my major that will help me as an Army officer is the exposure to global issues and possible steps toward finding a solution to those issues. Modern Army officers need to be able to understand the global community and the issues facing it currently."

## Imagination in Action

From animated sock monkeys to top hats with their own planetary systems, Virginia Tech's presence in Northern Virginia just became a lot more fun.

In the fall of 2016, the university joined with computer chip manufacturer Qualcomm in launching Thinkabit at Virginia Tech, a multiyear collaboration aimed at introducing middle schoolers to the wonders of science and engineering through robocrafting.

The Thinkabit Lab experience offers both students and teachers an engaging learning environment—equal parts makerspace, classroom, and mad-scientist laboratory—to foster creativity, collaboration, and the critical skills necessary for the 21st century.

The new lab—Qualcomm's first Thinkabit venture outside of San Diego—is led by Virginia Tech's School of Education in the College of Liberal Arts

and Human Sciences and Department of Engineering Education in the College of Engineering. Jim Egenrieder, who earned his master's degree and doctorate from the School of Education, now directs the lab.

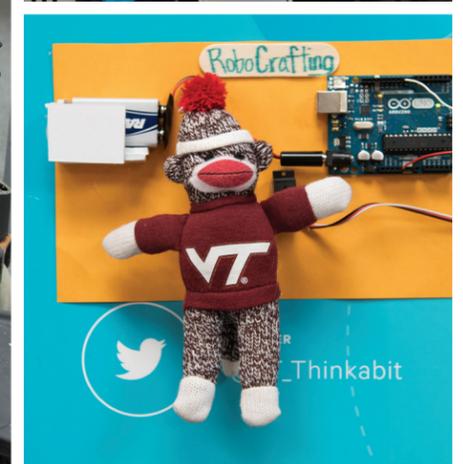
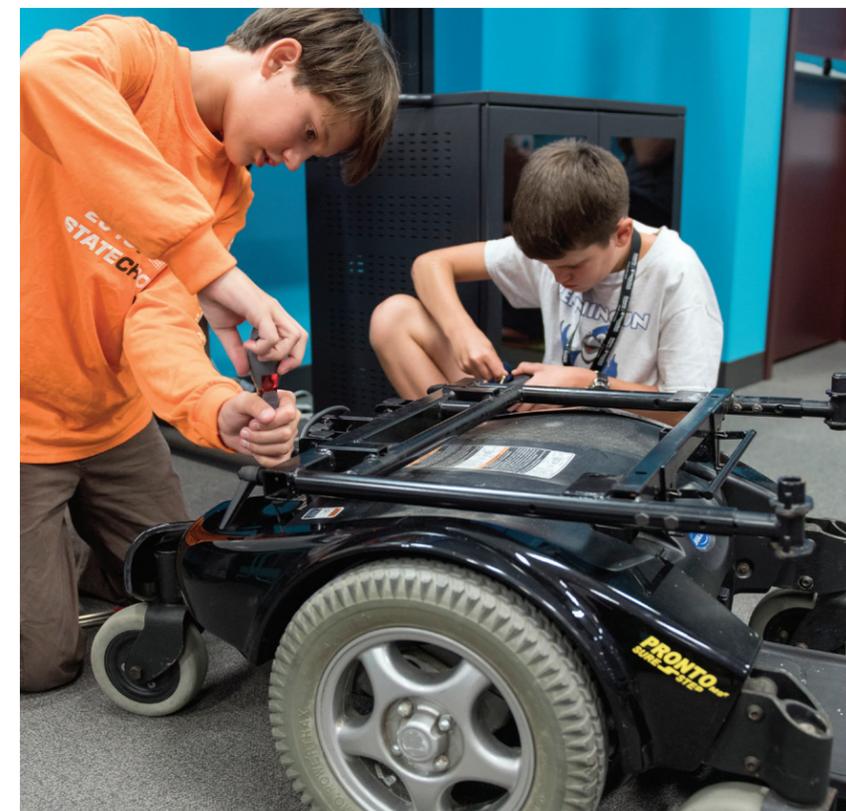
Thinkabit at Virginia Tech focuses on underserved students; students underrepresented in careers in STEM—science, technology, engineering, and math; and teachers in the metro Washington, DC, area. For some students, the Thinkabit Lab will offer an introduction to hands-on STEM learning and real-world careers.

"We know that STEM skills can enhance every student's future, regardless of their field of study, and we need to prepare both students and teachers to address the complex challenges of tomorrow," says Tim Sands, president of Virginia Tech. "The Thinkabit collaboration with Qualcomm will allow us to

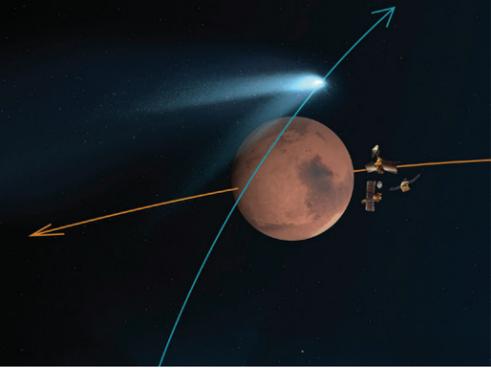
join complementary strengths and work synergistically to create opportunities and lower barriers."

The lab also leverages Virginia Tech's academic depth in both education and engineering to train teachers to develop innovative STEM experiences in schools and community programs.

"We want to create an environment that encourages what's called embodied learning—learning and doing as integrated activities," says Elizabeth Spiller, dean of the College of Liberal Arts and Human Sciences. "We're focused on creativity and innovation, introducing to an array of disciplines the applied learning that's integral to engineering. We want to give teachers a perspective shift, to inspire them to teach more creatively. Our goal is nothing short of changing the way kids learn in classrooms throughout the region."



**LEGENDS IN THE MAKING:** Using maker's tools and imagination, middle schoolers design, code, and build robocrafts at the Thinkabit Lab at Virginia Tech. Top right: Maya Dumas explains a project to Chris Lu, U.S. deputy secretary of labor, during the lab's grand opening in September.



## IT IS ROCKET SCIENCE

WHEN A MARS ROVER CROSSES Marathon Valley, Juno orbits Jupiter, or a Cassini spacecraft surveys Saturn's rings, it's the pioneering work of NASA's Jet Propulsion Laboratory. Realizing the visions of the lab's engineers involves years of planning and production. Unfortunately, some of the intricate production processes can endanger technicians and equipment alike, so training must be rigorous.

The laboratory recently collaborated with Virginia Tech's School of Education to create technology-based training solutions that are both effective and flexible.

"As the lab shifts to just-in-time learning options, it needs to incorporate best practices in its training," says Barbara Lockee, an education professor who specializes in instructional design and technology. "That's how we became involved."

A trio of past and present instructional design and technology students—Andrew Hopun and Adrienne Young, who earned master's degrees in 2016, and current master's student Trent Dawson—worked with Lockee to develop curricula that addressed crucial safety issues.

The Virginia Tech team launched their project in the summer of 2016 with a visit to the laboratory in Pasadena, California, a venture supported by a donation from Jeffrey Rudd (philosophy '83). Team members have since designed interactive, online modules based on principles of instructional design and human learning.

"We're so fortunate to engage with Jet Propulsion Laboratory colleagues in real-world instructional development experiences that meet an urgent need," Lockee says. "We're also grateful for Dr. Rudd's generous support."

# Design for Living

USA Today has ranked Virginia Tech as the nation's best for majoring in family, consumer, and human sciences.

The ranking category spans all the majors in the Department of Apparel, Housing, and Resource Management: consumer studies, family and consumer sciences, fashion merchandising and design, property management, and residential environments and design.

"Our programs involve active learning," says Julia Beamish, head of the department. "Classes are hands-on as well as foundational, and our students seem to revel in the experiential part of the curriculum."

The consumer studies major prepares students to analyze issues from the perspectives of consumers, business, and the government, while the family and consumer sciences major prepares graduates to teach in the areas of financial security, housing, nutrition, and health and wellness.

In the fashion merchandising and design program—ranked among the best in the world—students supplement classroom learning with New York City internships or

study in such fashion capitals as London, Paris, and Rome.

Property management majors learn the complexities of managing multimillion-dollar real estate investments. Graduates of the program—the first of its kind in the nation—pursue careers in operations, marketing, development, and acquisition of multifamily and commercial properties.

Majors in residential environments and design learn to design, select, market, and manage residential spaces and products. Opportunities for hands-on learning include the Center for Real Life Kitchen Design, which allows students to learn not only new applications for products, materials, and technologies, but also universal accessibility standards.

The department has long held a national reputation for excellence. USA Today named the program first in 2015 as well.

"Our programs are comprehensive but at the same time professionally driven, which means our students have no trouble securing jobs," Beamish says. "Our students are broadly and deeply trained to respond to a fast-changing world."



NOT JUST WINDOW DRESSING: Amanda Locke, who earned her fashion merchandising and design degree in 2016, served as president of Virginia Tech's student fashion society, which organizes an annual runway show.



ON THE EDGE: One of the most photographed spots on the Appalachian Trail, McAfee Knob in Virginia's Blue Ridge offers panoramic views of the mountains encircling the Roanoke Valley.

## Extreme Appalachia

In March 2017, Virginia Tech will host "Extreme Appalachia," the 40th annual Appalachian Studies Conference.

"By 'extreme' we mean the impassioned commitment people have to the region, the land, and Appalachian ways of life," says conference chair Anita Puckett, who is also an associate professor in Virginia Tech's Department of Religion and Culture. "The title also reflects the ways extreme economics—the excessive extraction of resources, underfunding of public services, and dismal job opportunities—have sparked community resilience and activism. We hope this conference will help advance a sustainable future for the region."

The conference title further refers to exploitative images in popular culture, such as reality-television depictions and hillbilly-horror movies, adds program chair Emily Satterwhite, an associate professor in the same department.

"Regionalist scholarship continues to explore ongoing struggles for racial, social, economic, and environmental justice," she says. "We want to celebrate the countering power of the region's visual, performance, and literary arts to nurture, provoke, and inspire."

Program highlights will include a keynote by James Hansen, a renowned climatologist at Columbia University, and "Extreme Appalachia! Rage and Renewal," a plenary convened by Barbara Ellen Smith, a Virginia Tech sociology professor, and Stephen Fisher, a professor emeritus at Emory & Henry College.

The conference is sponsored by the Appalachian Studies Association, which was formed in 1977 by a group of scholars, teachers, and activists passionate about the region. It will be the first time in more than 20 years that Virginia Tech has served as host.

## PLAN YOUR OWN APPALACHIAN SPRING

The cherry blossoms draping the shores of Duck Pond are just one reason to enjoy Virginia Tech's campus in the springtime. Here's a sampling of College of Liberal Arts and Human Sciences events that may tempt out-of-towners to visit in the early part of 2017. For more details, visit liberalarts.vt.edu/appalachianspring.

### Appalachian Studies Conference (March 9-12)

The 40th annual installment of the Appalachian Studies Conference will be held in Blacksburg for the first time since 1994.

### Civil War Weekend (March 17-20)

For a quarter-century now, the annual Civil War Weekend has allowed Virginia Tech scholars to showcase the university's extensive contributions to Civil War history—and to bring the past to life. In 2017, the weekend will include optional battlefield visits.

### Exposition IV: An Appalachian Spring (March 19)

This annual showcase of student and faculty talent offers choral and instrumental music in all styles and genres.

### Steger Poetry Prize Celebration (April 19)

Renowned poet Nikki Giovanni established the poetry contest to celebrate undergraduate talent. The event takes place each year during National Poetry Month.

### Glengarry Glen Ross (April 18-27)

Virginia Tech's production will feature an all-female cast, bringing a fresh dynamic to this David Mamet classic.



## Creativity and Innovation District

Virginia Tech has formed a Creativity and Innovation District—an area along the eastern edge of campus where it intersects with downtown Blacksburg—to champion the complexities of innovation, from idea creation to commercialization.

“The creation of the district is intended to enhance our distinctive strengths in 21st-century creativity and collaborative innovation,” says Thanassis Rikakis, the university’s executive vice president and provost. “Creativity today is highly dimensional and inclusive. The district will therefore promote strategic partnerships among students and faculty on campus, the local community, and private companies and organizations.”

The district will encompass a range of programs and facilities already in the area, including the School of Performing Arts and its principal performance space, Theatre 101; the Moss Arts Center; the Institute for Creativity, Arts, and Technology; and the School of Visual Arts.

The district designation will guide future thinking, repurpose assets, create physical space to leverage both creative and entrepreneurial activities—and spark the powerful innovations that can emerge at the intersection of the two.

“Creativity and innovation are at the core of what our faculty and students strive for,” says Elizabeth Spiller, dean of the College of Liberal Arts and Human Sciences. “We recognize that technology alone is never a solution because creativity and innovation are fundamentally human achievements. In bringing together our collective strengths in art, knowledge-making, information technology, and the innovative thinking that is the hallmark of liberal education, the Creativity and Innovation District will help ensure that Virginia Tech students from every discipline have the tools and perspectives they need to achieve meaningful solutions to complex human problems.” —John Pastor



**CREATIVE SPARKS:** Virginia Tech’s School of Performing Arts—known for its music, theatre, and cinema programs—will play a key role in the university’s new Creativity and Innovation District.

## LEADERSHIP IN HUMANITIES

IN 2016, VIRGINIA TECH became the only university nationally to host two prestigious National Endowment for the Humanities summer institutes.

“Veterans in Society: Ambiguities and Representations” explored what it means to be a military-service veteran in the United States.

“Societal perceptions of veterans are incomplete, reflecting a general lack of understanding about the small minority of citizens who serve on active duty,” says program co-director James Dubinsky, an associate professor of rhetoric and writing in the Department of English. Dubinsky hopes the institute will have a legacy in serving as a catalyst for building a national, interdisciplinary network of scholars in veterans studies.

“Race and Mental Health in History and Literature” explored historic and literary portrayals of mental health among Africans and African Americans.

“So much of the way we talk about race in the United States is political and local—the struggle from slavery to freedom, Jim Crow laws, the civil rights movement,” says Matthew Heaton, the associate professor of history who directed the program. “This seminar aimed to help us understand historically and artistically the ways that our conceptions of race shape both our ideas about human psychology and the experience of self.”

# Class Acts *Inspirational Learning*

**SPACE ODYSSEY:** Feeling let down by George Jetson and Spacely Space Rockets? You’re not alone. Students in a seminar on the origins of innovation thought the future would be more riveting—or so they say.



## We Thought the Future Would Be Cooler

Will automated drones, driverless cars, and intelligent robotics improve lives or destroy societies? That was the principal question fueling a touchscreen arcade game that Virginia Tech students created to encourage exploration of the long-term impact of automation.

“Rapid developments in automation technologies are expected to reshape cultures worldwide, with significant consequences,” says Andrew Kulak, a doctoral student in rhetoric and writing in the Department of English. “In designing the game, we wanted to spark conversation about the ideas and values behind those technologies.”

The arcade game was one of three scenarios on display at “We Thought the World Would Be Cooler,” a Newman Library exhibition held in the spring of 2016. For the scenarios, students commandeered the university’s visioning initiative, Beyond Boundaries, to imagine the world in 2047. The project stemmed from Origins of Innovation, a graduate seminar that aimed to challenge beliefs about innovation.

In addition to the arcade game, the scenarios included a futuristic yet grim dorm room that served as a canvas of institutional change through the eyes of those most affected, and a futures card

game that allowed middle schoolers, undergraduates, and graduate students to predict how people will interact with objects in 2047.

“Visions of the future are almost always wrong,” says Matthew Wisnioski, the associate professor of science and technology in society who led the seminar. “We’re too optimistic or too gloomy. We assume current trends are lasting, or we overestimate disruption. And things get worse when we try to control the forces of change. We expect our innovations both to achieve our intended outcomes and be embraced. We wanted to explore those dynamics through a series of inventive scenarios.”

## SKY'S NOT THE LIMIT

WHEN THE HEAD OF NASA visits a university founded in the polytechnic tradition, you might expect him to be addressing aerospace engineers. Instead, Charles Bolden, Jr. visited Virginia Tech in February 2016 to inspire creative writing students. In his remarks, Bolden talked about NASA's mission, offered advice to students interested in space travel, and talked about a growing need for writers in space.

"We think it's critically important," he said, "to bring people in who have a way with words, who can help us to paint word pictures of what we do to share with a larger number of people."

Bolden also urged audience members to take chances, chase their dreams, and, "Get on with life!"

Poet Nikki Giovanni, a University Distinguished Professor in the Department of English, had invited Bolden to speak to her students. A self-proclaimed space freak, Giovanni playfully admitted to a "not hidden" agenda of rocketing poets to the top of NASA's list for space exploration.



**ROCKET MAN:** Charles Bolden, Jr., the head of NASA, advocates space exploration for poets and other writers.



**ORGAN RECITAL:** "The arts have always been as critical to me as my kidneys are," Lynda Barry says. "It's like a dialysis machine you draw yourself."

## Creativity Unbounded

"The original digital device is this," cartoonist Lynda Barry said, holding up a hand and wagging her fingers. "Plus! It's wireless and biofueled."

As part of the Virginia Tech Department of English Visiting Writer Series, Barry gave a presentation at the Moss Arts Center on, as she described it, "our innate creative ability to work with images and what the biological function of this thing we call 'the arts' may be." She also gave a craft talk on her approach to writing and cartooning.

Barry has worked as a painter, cartoonist, writer, illustrator, playwright, editor, commentator, and teacher—professions she has found to be very much alike. Widely credited with expanding the literary, thematic, and emotional range of American comics, her seminal comic strip, "Ernie Pook's Comeek," ran in alternative newspapers across North America for 30 years.

The central question driving her art across the decades has been, "What is an image?" An image, she said, is common to everything we call the arts—or anything a child might call a toy.

"A kid in deep play is in the same state as an adult in creative concentration,"

Barry said. "There's a tacit understanding across cultures that there's a connection between play and mental health. Yet most of us give up on the arts in stages. We think if we can't do something well, we have no right to it. It would be as if we couldn't ride a bike unless we rode it like Lance Armstrong."

Now an assistant professor of interdisciplinary creativity at the University of Wisconsin-Madison, Barry noticed that graduate students writing their dissertations tend to be miserable—the result, she suspects, of such a narrow and prescribed focus.

So Barry pairs graduate students with four-year-old "co-researchers" in a program she calls Drawbridge. The students spend an afternoon a week collaborating with their preschool partners, essentially borrowing the children's state of mind to open themselves up to discovery.

"At the center of everything we call the arts and children call play is something that seems somehow alive," Barry said. "When we say, 'It looks like a kid drew it,' what if that's what it looks like when someone has an idea? What if that's what a live wire looks like?"

## SOUND INSPIRATION

TRADITIONAL BEL CANTO joined with digital experimentation when composer, performer, and media artist Pamela Z premiered a new work at Virginia Tech in April 2016. The work was held in—and inspired by—the Cube, the Moss Arts Center's high-tech and theatrical immersive space.

The performance, presented in partnership with the School of Performing Arts, featured works for voice with processing, samples, gesture controllers, spatialized sound, and interactive video. In creating the work, Pamela Z collaborated with Eric Lyon, an associate professor of practice in the School of Performing Arts, to explore the spatial sound projection capabilities of the Cube.

A pioneer of live digital looping techniques, Pamela Z processes her voice in real time to create dense, complex sonic layers. She also uses wireless musical-instrument-digital-interface controllers to manipulate sound with physical gestures. Her solo compositions combine experimental vocal techniques, operatic bel canto, found objects, text, and elements of musique concrète, an assemblage of recorded sounds abstracted for their musical value.

Her Cube performance marked the culmination of Pamela Z's weeklong visiting artist residency at Virginia Tech. During her stay, she discussed her creative process and sources of inspiration with members of a graduate poetry workshop led by Erika Meitner, an associate professor of English and director of the master of fine arts program in creative writing.

"In my writing workshops I ask students to engage with different modes across the arts spectrum," Meitner says. "My students had no previous exposure to musical composition, and because poetry has a large aural component, they were curious about Pamela Z's methods and inspirations. Being able to attend her performance and make poems from her pieces was a truly generative experience for all of us."

*I left Pamela Z's performance feeling emotionally affected in a way I hadn't expected and couldn't fully explain. The way she was able to evoke emotion purely through sound made me think about the overall relationship between sound and memory. In responding to the performance through poetry, I attempted to create a piece that speaks to the experience of accessing—and attempting to understand—a difficult memory through sound.*

—Kaitlen Whitt (Creative Writing MFA, 2017)

### Echoic Memory

If the realization that you're texting a friend who committed suicide two months ago made a sound, it might sound like this—

Straight pins dropping on a tiled floor in a quiet house  
The thump tires make when they compact a small animal into two dimensions  
Fresh snow crushed beneath feet that are carrying a body someplace it doesn't want to be  
A telemarketer's voice on the other end of the line when you weren't expecting a stranger  
The mournful song of ungreased escalator gears  
A smoke alarm's serrated, inconsistent yelp  
The wind snapping trees like toothpicks as it opens up a hollow the seal on a jar being opened, that—that pop—that sudden—burst of knowing—

Your friend's ruined flesh—the pop of the hammer  
As it came down on the firing pin and opened a tunnel  
Straight through her skull—your friend escaped through the hole  
She'd made in herself—that pop opening her up—the last thing  
She must have heard—before your friend and your friend's body became two different things—



**GOOD VIBRATIONS:** Pamela Z both premiered a new work and inspired poets at Virginia Tech.

**THE PLAY'S THE THING:** The musical *The Fantasticks* offered Virginia Tech students a range of opportunities to express their artistic wit.

# creative genius

Virginia Tech professors reveal secrets for nurturing their students' imagination and ingenuity.

**CAN CREATIVITY BE TAUGHT?** That question, the faculty experts in these pages believe, carries the wrong inflection. Creativity is innate, and rather than taught, it must be animated, practiced, and emboldened.

Creativity takes many forms. At its very essence, one of these experts contends, creativity is problem solving: expressing a fictional character's emotions, remaking the ancient art of music, following the lead of curiosity, reimagining the world.

Why nurture creativity on campus? Creativity leads to innovation; innovation, properly conceived and guided, leads to a better world. At Virginia Tech, students draw inspiration from the university's motto, *Ut Prosim* (That I May Serve). Their inventiveness serves society.

At this university, with its roots in the polytechnic tradition, faculty and students embrace the synergy of art and technology. The arts and humanities spark insights, while technology infuses traditionally creative disciplines with fresh energy and promise.

Crafting their own course of study, many students blend technology-based fields, such as computer science and engineering, with more arts-focused areas, such as music, cinema, theatre, and creative writing. They fuse ideas across disciplines into fresh constructions, inventing new approaches, tools, and even art forms.

For them, creativity is both the path to innovation—and a worthy aspiration in itself.

"Imagination is more important than knowledge," Albert Einstein once said. "Knowledge is limited. Imagination encircles the world."

# How to Conduct an Orchestra without Musical Instruments

by Ivica Ico Bukvic

**WHAT IF A CONDUCTOR** didn't have to rely on musicians playing bassoons and violas and timpani? What if the conductor's very motions—the finger taps and arm flourishes—were what created the symphonic sounds? That question drives my students' and my own passion for discovery with our unusual ensemble, the world's first Linux-based orchestra.

Our Linux Laptop Orchestra, or L2Ork (which we pronounce *lorck*), combines a traditional musical ensemble with human-computer interaction technologies. I long wanted to experiment with combining the two not just to explore the edges, but also to broaden musical participation beyond musicians. Our orchestra brings together students from disciplines across campus, including the performing and visual arts, audio engineering, computer science, the humanities, and industrial design.

I also became intrigued with how Linux, as an open-source operating system, has turned the commercial arena on its head. So, to make orchestral music both affordable and accessible, I created Pd-L2Ork, a variant of the visual programming language Pure Data. Our laptop orchestra offers an optimal infrastructure for creative research at minimal cost. Unlike traditional instruments, which provide specific roles in an ensemble, laptops can produce any sound and fulfill just about any role. We supplement them with affordable technologies, including circuits, gaming

controllers, speakers made from salad bowls, and microphones we can breathe into, just like woodwind instruments. We're also experimenting with Raspberry Pi computers as an even more affordable platform.

L2Ork uses reverse-engineered Nintendo Wii remote controllers to convert human motion into sound. Recently, we began exploring alternative, Wiimote-like designs to make the controller less intrusive. We're also leveraging the ability of human skin to conduct electricity, thus creating inexpensive low-voltage "keys" out of our fingertips.

We choreograph our movements borrowing cues from tai chi. At first, we looked like we were swatting flies. Now, with the introduction of the choreography, we better resemble music in motion.

In 2009, we debuted in front of a standing-room-only crowd. It was shaky; one of our laptops crashed in the middle of the performance. But I don't think anyone noticed. The best part of the concert was at the end, when everyone in the audience flocked to the stage, curious to learn more. We've since given performances across the United States and Europe. And we've helped start seven laptop orchestras in North and South America, most of which rely heavily on L2Ork's affordable design.

People ask, why are you doing this? You're a music professor. My answer is that music and technology are inseparable. Today, more than ever, musicians have an opportunity to define ourselves much more broadly and to collaborate across disciplinary divides. With L2Ork, my students combine technical virtuosity with musical exploration, unencumbered by expectations.

To me, the most powerful element of the orchestra is its empowerment of students to take creative risks. That can be life changing. ■

*Ivica Ico Bukvic is an associate professor of composition and multimedia in Virginia Tech's School of Performing Arts.*



**WIRED FOR SOUND**  
Led by Ivica Ico Bukvic (seated), the initial research and performance team of the Linux Laptop Orchestra fashioned speakers out of wooden salad bowls.



**BIRDS OF A FEATHER**  
Autonomous discovery algorithms may help biologists better understand interactions within bird flocks and, eventually, the ideal swarm behavior for drones.

# How to Use Robot Scientists to Reimagine the World

by Benjamin Jantzen

**HOW WOULD SCIENCE** have unfolded differently across the centuries if Galileo had been an ecologist rather than an astronomer?

Some researchers believe today's scientific disciplines would have evolved just as they have; others suspect we might have developed a markedly different view of the world.

It's my job as a philosopher to argue for the big picture, so I'm developing a series of robot scientists—computer algorithms that can automatically select which variables are salient in the pursuit of scientific discovery.

When traditional scientists want to understand a phenomenon in nature, they choose which features to measure: color, temperature, surface pressure. But machines, oblivious to centuries of scientific thought and free of the cognitive biases of disciplinary depth, can explore a broader set of variables.

A group of student researchers and I have already built some promising prototypes of our discovery algorithms, a series we call "EUGENE" in homage to the theoretical physicist Eugene Wigner. Fortuitously, the Greek word *eugenes* also means well born.

It's easy to imagine EUGENE as a bespectacled academic dealing with abstractions, much like its namesake. From the start, though, we designed the algorithms to interact with the real world through sensors and actuators.

The central challenge has been how to get machines to conduct scientific research autonomously. We developed a possible solution to this conundrum, and EUGENE is allowing us to test some radically new approaches to automated scientific discovery.

In one early project, we're hoping EUGENE can illuminate the patterns of swarm behavior in birds and bats. The algorithm won't be analyzing data that have been preprocessed by humans. Instead, it will "watch" videos of birds and bats turning and swooping to identify patterns and choose the most promising features for further study.

In so doing, EUGENE may help biologists better understand interactions within flocks and swarms. Ideally, these results will also guide the ideal swarm behavior for drones.

I am making these algorithms open source, as I want to help introduce a new generation of students to the deep connections between philosophy and physical computing.

As part of this work, I led two workshops in the summer of 2016, one for doctoral students and another for middle schoolers. The idea for both was to help build a community of researchers with the skills and understanding to exploit the intersection between the philosophy of science and machine learning. The middle-school students left the sessions with their own mini-computers configured for developing new approaches to discovery.

In their quest to build robot scientists and put them to work, the participants—graduate students and middle schoolers alike—will learn to think beyond traditional conceptions of science and of the world. ■

*Benjamin Jantzen, an assistant professor in philosophy at Virginia Tech, won a National Science Foundation CAREER award in 2015 to develop a new approach to automated scientific discovery; EUGENE is the primary result.*



**RESISTANCE IS FERTILE**  
Years after refusing to yield her seat on a Montgomery, Alabama, bus in 1955, activist Rosa Parks explained, "I felt a determination to cover my body like a quilt on a winter night."

## How to Animate the Past

by Marian Mollin

**M**ORE THAN ANYTHING, I want my history classes to complicate how students think about the past.

Many students in my class on the Sixties, for example, start the semester assuming that the civil rights movement was limited to the contributions of Rosa Parks and Martin Luther King, Jr. They never realized civil rights struggles were everywhere, in cities and towns across the nation, at southern universities, even on their own campus.

Adding dimension to my students' understanding of the issues does more than deepen their knowledge; it sparks their curiosity and fuels their creativity.

I understand well the impulse to know the details of how a story turned out. After earning an engineering degree, I spent a decade doing grassroots political organizing. During that time, I worked with someone who knew luminaries of the civil rights and radical pacifist struggles, went on the 1961 Freedom Rides, and served time in the Mississippi State Penitentiary for his activism. His powerful stories made me want to know more. I decided to study history, to follow my instinct to learn from past struggles and to understand people's audacity, courage, and even limitations.

Part of the creative part of any discipline is in the analysis. The study of history is thus about more than uncovering basic facts; it's about interpreting significance, about answering questions of "why" and "how." So I teach my

students how to evaluate other people's interpretations and come up with their own. I'll have them read several articles about a topic, such as Lyndon Johnson and the Vietnam War, and then identify what they would contribute to the scholarly conversation. This exercise forces them to hone their analytical skills. It's not me explaining history to them; it's me leading them to their own moments of insight.

One essential tool I use in my courses is blogging. Shared blog entries offer students a fun and low-risk way to try out new ideas. The students incorporate images and video clips into their writing and comment on each other's work. The exercise raises the level of their creativity, interactivity, and thinking.

We also engage in digital storytelling. My Historical Methods students spend half of each semester doing original research, culminating in a five-minute video on the topic they've chosen to study. In exploring options for articulating and presenting their ideas, they struggle with the essential questions all historians must confront: What evidence do you use? Whose voices do you include? How do you construct your story? But the challenge of distilling their choices into a short video inspires a heightened level of focus and ingenuity.

In teaching, I try to meet my students where they are and then take them where they never expected to go. I tell them surprising stories, give them new analytical tools, and stoke their curiosity, knowing they're just beginning their own journeys of discovery. ■

*Marian Mollin, an associate professor of history at Virginia Tech, has received numerous honors for her creativity in the classroom, including, in 2016, the Carroll B. Shannon Excellence in Teaching Award and the Alumni Award for Excellence in Teaching.*

## How to Bring Creativity to Life on Stage

by Cara Rawlings

**B**EFORE WE HAVE WORDS, we have movement and gesture to express our needs, desires, and emotions. Years ago, while working as a dance choreographer for a new musical, I noticed an actor struggling to express the grief his character was feeling while singing a lament for his deceased father. On instinct, I murmured to the director that the actor should open his eyes and lift his arms. And it worked.

The director had been unable to help the actor find the truth of the moment through standard psychological acting techniques—recalling a time when the actor felt grief, or imagining a circumstance in which he might feel grief. Yet the physical manifestation of that moment caused a marked emotional and psychological shift not only for the audience, but also for the actor. What had been just a vocal riff suddenly became a heart-wrenching wail filled with the pain of loss.

It was then I realized I could help actors tell their characters' stories through movement. Now, as a theatre movement coach, I use various methods to coach actors in the psychological gesture—expressing psychological moments through physical movements.

Several years ago, for example, I had the opportunity to help a mute character create song using a clowning technique. One of my theatre students confided a secret role he had been playing: that of the HokieBird. Now, the Virginia Tech mascot doesn't speak, and his physical vocabulary is fairly prescribed. But my student wanted to me to coach him in finding a unique approach. Clowning was the natural correlation.

Clowns are characters who teach you how to see a performance, almost from a child's viewpoint. They have their own logic but no history, so they must prob-

lem-solve in the moment. My student practiced clown exercises to such a point of mastery that he discovered how to conduct a section of the football stadium in an impromptu performance of a song. Using only physical gestures, he guided each group to sing a single note on command and, as he conducted, the participants slowly realized they were joining with a quarter of the stadium in singing an entire song.

In the end, the HokieBird learned, as all my students do, that, at its core, creativity is problem solving. Actors—whether Shakespearean performers or mascots—identify the challenges of each moment and then work through possible approaches. Usually the "right" way to play a moment is the one that ignites actors' imaginations and touches their hearts. Such insights allow them to connect with their characters and, ultimately, their audiences. ■

*Cara Rawlings, an associate professor in Virginia Tech's School of Performing Arts, is a certified stage combat instructor as well as a movement coach.*



**ALL THE WORLD'S A STAGE**  
Using mime techniques, Cara Rawlings taught Mina Noorbakhsh—the caped actress playing *The Mute*—to build a believable world through just expression and movement.

# How to Keep the Story Machine Humming

by Matthew Vollmer

**USED TO TEACH CREATIVE WRITING** workshops more or less the traditional way: students wrote whatever they wanted outside of class, then we critiqued the stories of the day, with students commenting on each other's work. But I've since found the writing becomes much more compelling when my students face limitations.

Think about it: Which would you find more intriguing—an improvisational dance in which the dancer could do anything he wanted, or one in which the dancer's hands and feet were bound?

So I'll ask my students to write, for example, a realistic story about a mythological creature. The stricture is limiting, yet they still have an entire universe to explore. If they can't engage with the assignment, that's okay, too. I encourage students to find imaginative ways to subvert the prompts and break the rules.

Recently, I've been reserving 15 minutes at the end of each class—even literature classes—for students to write creatively. In my Contemporary Fiction course, I ask my students to tackle an exercise I call Writing Under the Influence—producing a story in the style of one or more of the writers we've read. They find the assignment liberating. When they write in a genre they've never tried, such as magic realism, their palette enlarges, and they end up abandoning writing that feels obligatory.

I don't teach my students so much as challenge them to experiment. I ask them to think about writing forms beyond stories and essays—grocery lists, Twitter feeds, epitaphs—and to consider the particular conventions of those forms. There are unstated rules to writing a product warning, for example, that allow it to be identified as such. What happens when you conform to some of those rules, but break others?

When you pour your story into a new, unexpected form, the form starts to break apart—and the writing comes alive.

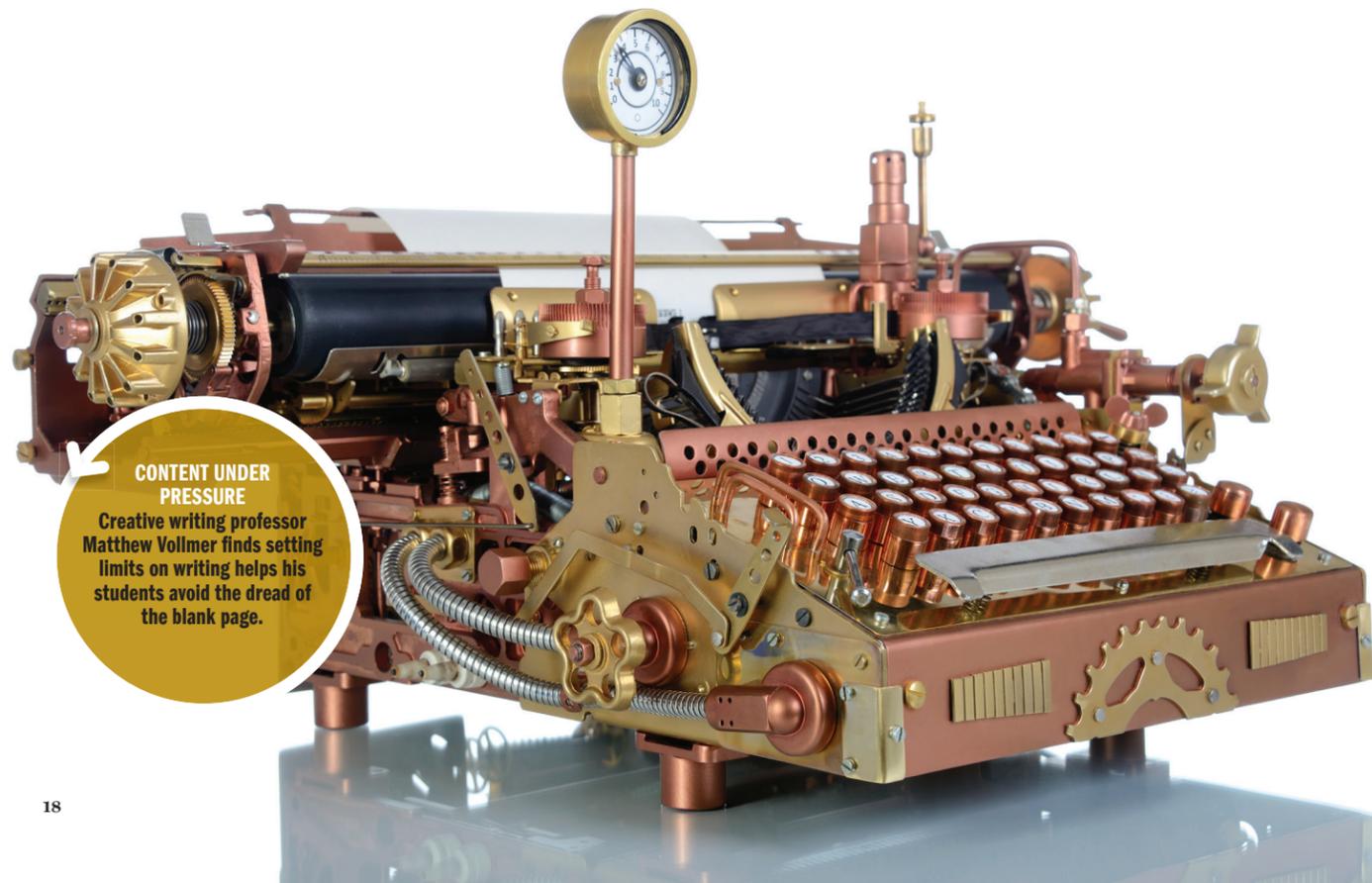
Then you've powered up what I call the story machine—appropriating a writing form to tell a story. Often you generate a tension when you ask a form to do something unconventional—and that tension is what fascinates readers.

I call it *story machine* because I find the juxtaposition of those words interesting. When a story takes on an unexpected form or limitation, that's the start of automation, almost like a Rube Goldberg contraption aimed at banishing writer's block. Even in literature classes, under time constraints, my students always produce something creative.

In my own work, when I'm pushing against the boundaries of what I mean to say, the writing surprises and inspires me. For the true joy of writing is found not just in the making, but in not knowing where the words will take you. ■

---

*Matthew Vollmer, an associate professor of English at Virginia Tech, directs the undergraduate creative writing program. A previous Pushcart Prize winner, he has written three books and edited two collections.*



## CONTENT UNDER PRESSURE

Creative writing professor Matthew Vollmer finds setting limits on writing helps his students avoid the dread of the blank page.



## BEST PRACTICES

During an OPERAcraft dress rehearsal at the Moss Arts Center, high school students direct the screen avatars while Virginia Tech students sing the libretto.

# How to Take Minecraft to Operatic Heights

by Ariana Wyatt

**O**PERA, AS A HIGHLY COMPLEX ARTFORM, can teach skills in many areas beyond vocal virtuosity and musical composition: storytelling, character development, scene construction, choreography, stagecraft. Several years ago, I wanted to use the multifaceted nature of opera to create the kind of intensive art program that can be so effective in building creative confidence.

Staging an opera is expensive, of course, so I discussed technological options with one of my music department colleagues, Ivica Ico Bukvic. He suggested we adapt Minecraft, the popular video game that allows users to create their own avatars and intricate, three-dimensional worlds. Ico assured me that, if a technology we needed had not yet been invented, we could do the inventing. And OPERAcraft—a performance tool that merges opera and gaming—was born.

Using programming he created for his laptop orchestra, Ico modified Minecraft technology to allow the avatars more expressivity. He gave them arm gestures and animated their mouths to match the vocal movements of live opera singers. Through his coding wizardry, when an OPERAcraft performer sings complete words, the corresponding avatar's mouth opens and closes. When the performer sings a sustained vowel, the avatar's mouth shakes as if in vibrato.

A group of local high-school students created the world's first Minecraft-based opera. They crafted the storyline, wrote the libretto, designed the avatars, built the virtual set, and staged the show. Virginia Tech graduate students joined me in managing the project, which required equal parts performance, design,

and technology. Performing arts faculty directed the videography, virtual fights, and musical construction. Voice majors performed the score.

Then, in front of a live audience at the Moss Arts Center, OPERAcraft became a first-of-its-kind performance. With the virtual environment projected onto a giant screen, Mozart provided the musical score, high schoolers controlled the avatars, and undergraduates sang.

Our undergraduates witnessed how an interdisciplinary project can help younger students develop creative-thinking skills in a collaborative learning environment. By broadening accessibility to the arts and tapping creativity, we hope OPERAcraft can encourage even more people to learn and grow. ■

---

*Ariana Wyatt, an assistant professor of voice in Virginia Tech's School of Performing Arts, is an award-winning soprano who has performed in operas, concerts, and oratorios throughout the country.*

# *the* innovation imperative

Innovation is more than synonymous with creative technologies and artistic imagination; it is also a national necessity. by Matthew Wisnioski



**INNOVATION IS A BUZZWORD TODAY.** In both the popular and technical press ... we are told whether, when, where, and how to innovate, but little attention seems to have been paid to *what* to innovate. This important and intensely practical question is probably the most difficult of all to answer.”

These words, decrying the cliché of innovation while also embracing its promise, may not be surprising. Less expected is the year they were written: 1970. George Dacey, a pioneer of the telecommunications industry, penned them to explain the manager’s challenge of choosing where to invest limited resources amid many possible paths.

Nearly 50 years later, innovation—and its promise of cutting-edge technology and economic prosperity—is more than a buzzword. It has become the global economy’s imperative, as universities, corporations, and even local school boards seek to cultivate new generations of innovators.

The meaning of the word *innovation* has evolved over time. For many centuries, innovators were religious heretics. In the 1950s, though, innovation became a positive signifier of progress. Today, innovation typically suggests the commercialization of a new technology in a way that creates social and economic value. Yet innovation is also synonymous with creativity, design, artistic imagination, and cultural change.

Since the word's rehabilitation, there have been countless efforts to make innovators at different career stages. The National Science Foundation's Innovation Corps program, for example, may teach a mid-career systems biologist to translate scientific discoveries into marketable products. In magazines and books, business gurus offer new entrepreneurs recipes for developing the techniques and personal habits they need to innovate. An afterschool clubhouse in Detroit teaches an eight-year-old girl to make a virtual fox dance using a programming language designed to foster lifelong creativity.

Architects of these programs share the belief that everyone, regardless of vocation, should innovate. They encourage Americans to tap the country's legacy of invention to keep pace with rapid technological advances in the face of increasingly complex problems. By unlocking our creative confidence, they suggest, we can all learn to thrive in a knowledge economy that rewards entrepreneurship and ingenuity.

### CHAMPIONS OF INNOVATION

From Thomas Edison's laboratory in Menlo Park, New Jersey, to Facebook's headquarters in Menlo Park, California, those in the

business of innovation have always pondered the essence of innovators. Stories abound of technological wizards whose very force of personality drives breakthroughs. Profiles of Mark Zuckerberg and Steve Jobs echo qualities once attributed to Edison and Nikola Tesla.

These young, gritty, and creative men—and in such tales they are almost always men—overcome failure and naysayers to create products that remake the world. With varying shades of plausibility, their biographical accounts offer the prospect that you, too, can follow in their footsteps to become the next great innovator. But what characterizes an innovator?

The first systematic attempt to understand the characteristics of innovators emerged in the 1950s, when Everett Rogers, a graduate student in sociology, showed that innovators followed a similar pattern across communities as diverse as elementary schools and Native American tribes. He later described innovators as having a “propensity for venturesomeness,” for the “hazardous, the rash, the avant-garde, and the risky.”

These “agents that promote change,” according to Rogers, have six qualities in common. They are young, high in social status, drawn to “impersonal” information, cosmopolitan, thought leaders, and frequently viewed as “deviant.” His conclusion: innovators are curious and intelligent mavericks who can be found anywhere.

Programs designed to cultivate innovators emerged and grew in the United States during the 1960s and 1970s, fueled by technology managers, entrepreneurs, and venture capitalists. The chief drivers of those programs, though, were federal agencies.

The Department of Commerce and the National Science Foundation created public-private incubators aimed at transferring the

## Advocates share a core belief: Innovators are made, not born, and we are not doing enough to cultivate this national resource.

fruits of basic research and weapons development into the domestic economy. To remake scientists and engineers as innovators, these agencies also funded university entrepreneurship programs that combined science, technology, and business development.

Today's efforts to make innovators build on this legacy. The rise of personal computing and the internet spawned visions of college dropouts becoming instant billionaires. Programs once targeted to technology executives now shape our approach to elementary education. Feminism and equal-opportunity legislation have helped generate alternatives to the stereotype of the brash young man. And global competitiveness has raised questions about where innovation happens and what role immigrants should play in the country's innovation policy.

Programs focused on the skills, mindsets, and tools of innovation range widely. Yet their advocates share a core belief: Innovators are made, not born, and we are not doing enough to cultivate this national resource.

### INNOVATION ON TRIAL

Much of the rhetoric about innovation has viewed it as a natural and unquestioned engine of economic and social progress, a universal good that overshadows power imbalances. Yet critics have begun to question the goals, blindspots, and shortcomings of initiatives aimed at fostering innovation. For every program intent on making innovators, more and more critics are asking: to what end?

Much of the criticism has focused on the persistent underrepresentation of women and minorities in scientific and technical fields. A 2016 study, *The Demographics of Innovation in the United States*, found that decades of efforts to expand opportunities for women and minorities have had little impact on increasing their representation in those fields. The study suggests that the median innovator in the United States is a white man in his late forties with an advanced degree; women represent only 12 percent of innovators, and minorities born in the United States make up only 8 percent, with African Americans less than 0.5 percent.

Some critics further question the values of innovation, with the realization that technology alone cannot solve most problems. Some detractors point out the shallowness of gadget-centric “solutionism,” the unequal distribution of innovation's burdens and rewards, and the fetishism of novelty. At the core of their analysis is a challenge to the definition of innovation, a concept so increasingly expansive that it risks losing all meaning.

Recently, these critiques have begun to coalesce into a new understanding of innovation. Many leading thinkers in this area

are reformers within the scientific and technological community who want to expand access to innovation and redefine the behaviors—such as extreme competitiveness—with which it is stereotypically associated. Reformers also promote new ideals of collaborative creativity and the cultivation of patterns of discovery made through play and “making,” detached from commercial interests. Others champion alternative values, such as maintenance and caregiving, that have been overshadowed by the focus on making innovators.

### CRITICAL PARTICIPATION

U.S. universities are increasingly developing educational programs in innovation, entrepreneurship, and creativity. For such programs to have broad and equitable impact, participation needs to extend beyond science and technology to encompass the humanities and social sciences, which can question assumptions, provide fresh insights, and reframe solutions.

The pressure to train and equip new innovators is unlikely to subside anytime soon, so it is incumbent on critics of innovation to understand—and help shape—how innovators are made. Scholars in the science-and-technology-studies discipline call this approach critical participation. It encourages anthropologists, historians, philosophers, and sociologists to explore the values and consequences of innovation alongside the practitioners they study.

Partnerships among practitioners and scholars can also enhance the curricula of both the technical fields in which innovators tend to reside and the critical fields that study them. As humanists, ethnographers, and other scholars increasingly work with practitioners from science and engineering, together they have an opportunity to develop more collaborative, diverse, contextual, and ethically informed approaches to complex societal challenges.

That innovation has remained a buzzword for over half a century speaks to its enduring capacity to inspire both aspirations and anxiety about working to forge the future. It also suggests important and intensely practical questions: Innovation for what? And by whom? ■

*Matthew Wisnioski is an associate professor of science and technology in society at Virginia Tech. He is developing his insights into critical participation in innovation in Can Innovators Be Made?, a book project by innovation experts and critical scholars, edited in collaboration with Eric Hintz of the Smithsonian's Lemelson Center for the Study of Invention and Innovation and Marie Stettler Kleine, a doctoral student in Virginia Tech's Department of Science and Technology in Society.*



# living *the* dream

The best inspiration for students hoping for creative careers?  
Alumni who are walking the walk.



## Kelsy Dominick

Fashion Merchandising and Design '13 CEO, DiDomenico Design

IN JUST UNDER TWO DECADES, Kelsy Dominick went from sewing dresses for her Barbies to being the first U.S. designer in at least 60 years to send her creations down a fashion runway in Cuba.

“Fashion, as a universal language, is a wonderful way to break down barriers between countries,” says Dominick, who, soon after graduating, launched DiDomenico Design, a couture design firm in the Washington, DC, area.

In the fall of 2015, after seeing Dominick showcase a collection of evening gowns during New York Fashion Week, a group of Cuban trade representatives had asked whether she would be willing to participate in *Arte y Moda*, a November 2016 fashion show in Havana. They were seeking a designer to help warm relations between Cuba and the United States; by chance, they found someone also trained in international relations.

“I always knew I wanted to pursue fashion, but I was drawn to international studies too,” says Dominick, who majored in both fields. “The fashion show in Cuba allowed me to do both.”

Her passion for international travel influences her design choices, Dominick says, as does family tradition. On her African American side, her grandmother owned a reupholstery business; on her Italian side, her Great Aunt Bessy created elaborate gowns for her Little Italy clients.

“The key to their craft,” Dominick says, “was dedication to detail, with perfection in every stitch. My mission is to carry on such long-forgotten craftsmanship, with creative flair.” ■



## Bobbie Allen

English '08 | Singer and Songwriter

**H**OW SHOULD BOBBIE ALLEN'S MUSIC be characterized? Stumped, she turns to Wikipedia. "It says here I'm an indie-pop alternative artist," she says, laughing. "I guess that's about right."

Allen's hesitation to define her music may stem from the circuitous path she took to becoming a recording artist. Despite a successful career with a leading consulting company, she found herself increasingly drawn to the music industry.

"Music was always a safe harbor for me growing up," she says. "When things were miserable, I turned to music; when things were great, I turned to music."

Allen taught herself to play guitar and write songs. And although she had always loved singing—her vocals have been described as "low," "smoky," and "strikingly

**"When people tell me my music helped them through a difficult time, it feels wonderful."**

wistful"—she struggled with stage fright. So she forced herself to sing at open-mic nights. "At first it felt debilitating," she says, "but I had a strange compulsion to keep trying."

Allen felt freer when she adopted a recording name, Young Summer. "I liked the idea of adopting a name that would give me the flexibility of performing as a solo artist or as part of an ensemble," she says. "Then I realized it also helped me feel less vulnerable."

As she gained artistic and professional success, Allen felt she was ready to quit her day job. Her songs have since appeared on the soundtracks of films, commercials, and such television programs as *Grey's Anatomy*, *The Vampire Diaries*, and *Revenge*. She released an extended-play album, *You Would Have Loved It Here*, in October 2016, two years after issuing her first studio album, *Siren*.

Allen credits her English professors—especially poet Nikki Giovanni—with giving her the confidence to forge her own artistic path.

"Nikki said if you haven't made a mistake, you haven't done a damned thing with your life," Allen says. "She also urged us not to take 'the stink of the earth' out of our art. I think about that whenever I'm writing a song. Am I making it better, or am I eliminating an important element of failure? If I become too safe, I'll lose what's creative and interesting."

Giovanni's name appears in the liner notes of Allen's albums.

"I hope people are moved by my music," Allen says. "You make art for yourself, but then you realize it resonates with others. When people tell me my music helped them through a difficult time, it feels wonderful."

Once she made the commitment to the creative life, Allen adds, she kept being presented with remarkable opportunities. "It's been exhausting but worthwhile. Often, I think: I'm so meant to be doing this." ■

PHOTO: CATIE LAFFOON

## Mike Butera

Philosophy MS '08; ASPECT PhD '10 | Founder of Artiphon

**M**IKE BUTERA WAS ALWAYS THE GUY IN THE BAND toting multiple instruments: the beat-up banjos, the ukulele rescued from a dusty shop, the cello that overwhelmed the stage. The classically trained violinist, who played in an Americana-roots band, couldn't help himself. He was always tinkering with musical instruments—those he knew how to play and those he'd never learned.

Then, one evening, he and a friend felt inspired to play music, but all they had with them were apps on their cell phones. As he tapped the glass of his phone, Butera began to muse on an idea. Soon the guy notorious for schlepping too many instruments around had figured out how to shrink them into one.

In 2011, Butera founded Artiphon, a music technology company in Nashville whose first creation, the INSTRUMENT 1, allows players to strum a guitar, bow a violin, tap a piano, and loop a beat—all on a two-pound, molded-plastic device resembling a wide guitar neck.

"We wanted to build a new category of musical instrument, to change the way we think about who plays music and how," Butera says. "Now, with a single instrument, you can be the entire band."



**"We wanted to change the way we think about who plays music and how."**

PHOTO: COURTESY OF ARTIPHON

After launching their product on Kickstarter, Butera and his collaborators raised more than \$1.3 million in the most successful musical-instrument campaign in the crowdsourcing platform's history. *Time* magazine named the device one of the best inventions of 2015.

Butera likens his brainchild to the classic optical illusion of a duck whose bill, in profile, may actually be the ears of a rabbit. "With the touch of a button you can switch between radically different instruments," he says. "The device can be the duck or the rabbit depending on how you view it—as a keyboard, for example, or as a string surface."

The instrument connects to a range of mobile devices to enable users to access music apps such as GarageBand. "Through a software interface," Butera says, "you can make any sound in the world, whether it's from a sitar, a gamelan, or a 1957 Fender bass."

Users can also customize the way they generate those sounds. "Most musical instruments are played in a singular way," Butera says. "You learn to play *the* piano or *the* violin, but you can't play a piano like a violin. The INSTRUMENT 1 allows you to mix and match playing styles. If you're a guitarist, you can strum a piano. If you know the violin, you can bow a synthesizer."

Butera, who holds a master's in philosophy and a doctorate in sound studies, both from Virginia Tech, credits his doctoral program with giving him the theoretical foundation and creative flexibility to conceive Artiphon. He was the first graduate of the Alliance for Social, Political, Ethical, and Cultural Thought, better known as ASPECT.

Butera's ultimate mission is to make playing music accessible and irresistible to all. "We're aiming for a musical experience focused on exploration and creativity rather than skill," he says. "We believe technology should be the invisible collaborator that encourages dabbling. We want to inspire people to explore music-making in their everyday lives." ■

VOLUME ONE ILLUMINATION 27



## Allan Wolf

English '85, MFA '88 | Author and Performance Poet

**A**LLAN WOLF VIEWS THE WORLD THROUGH A POET'S EYES—and he travels nationally and even internationally to share that vision. “When you look through a poet’s eyes, you see the possibilities that other people miss,” he says. “You use your imagination to translate the world from ordinary to extraordinary. Imagination and creativity are the keys to innovation, whether you’re a poet, a scientist, or an athlete.”

Wolf likens the poet’s vision to a still life in the hands of a gifted painter. “You might see a plain candlestick, a pomegranate, and some plums,” he says, “but you’ll also notice something astonishing about the light and how the shadows are cast.”

In the early 1990s, after earning his master’s degree in English and teaching at Virginia Tech for three years, Wolf joined Poetry Alive!, a traveling troupe of

poets and actors who performed poetry in schools across the United States. He also helped the poetry slam movement take root in the South by founding the Southern Fried Poetry Slam, which is thriving nearly a quarter century later.

Now Wolf presents poetry in witty, exuberant, and even gleeful ways to audiences ranging from preschoolers to adult inmates, from Shreveport to Shanghai.

“As a performance poet, I can combine my interests in literature, theatre, and teaching,” he says. More dramatically, he found a way to make a living from poetry, an income strategy that took some initial courage.

“It can feel risky when you decide to make your living from your art,” he says. “Once you’re comfortable not knowing how each

“Imagination and creativity are the keys to innovation, whether you’re a poet, a scientist, or an athlete.”

domino will fall and you’ve jettisoned yourself out there, though, you gain freedom. Once you leave the stability behind, the adventure itself becomes a stabilizing force.”

Wolf notes that he now teaches people a way of viewing the world through not just performance, but the written word as well. He is the author of a number of award-winning books for children and teens, including *The Watch That Ends the Night: Voices from the Titanic*, a novel in verse that offers first-person accounts of the tragedy from two dozen narrators, including the iceberg, and *New Found Land: Lewis and Clark’s Voyage of Discovery*, a lyrical recreation of the famed expedition.

“I love performing because once I’m on stage, it feels like I’m inside a poem, actually living and breathing the words,” Wolf says. “Writing books has its own rewards, though. You walk off stage, and the performance is over. But a book is always there. People can read it years later, miles and miles away, and they can be moved by what you wrote.” ■

PHOTO: COURTESY OF ALLAN WOLF



“The arts and technology blend and make each other stronger. When put together just right, magic happens.”

## Kelly Ryner

Theatre Arts '88 | President, Thinkwell Asia

**A** 16TH-CENTURY CHINESE KINGDOM ruled by a mischievous monkey. An Inca-cursed, fire-breathing temple harboring a legendary treasure. The hidden chambers of Hogwarts School of Witchcraft and Wizardry. These are just a few of the imaginative worlds that Kelly Ryner has helped animate for audiences worldwide.

As a teenager, Ryner had already mapped out her career. “I wanted to be a scenic artist and art director for children’s films,” she says. “I wanted to work for Steven Spielberg. I wanted to do the next big, immersive fantasy film.”

Ryner chose Virginia Tech because its theatre program was the only one that told her what she *could* do rather than what she couldn’t. Her professors helped her tailor her curriculum and even created several specialty courses just because she requested them.

After graduating, Ryner found her true calling in the world of themed entertainment. She started as a scenic artist for Disney Studios and Universal Studios and eventually worked as an in-field art director on a range of projects worldwide.

In 2001, she became the first employee of Thinkwell, an international design and production firm specializing in location-based entertainment. There she worked on such projects as the *Warner Bros. Studio Tour London: The Making of Harry Potter*, an immersive experience that allows visitors to explore the magic of dozens of original sets and hundreds of authentic props from all eight films.

One of her most memorable projects was art directing the sculpture and painting for the special effects show of *Templo del Fuego*—Temple of Fire—at Universal’s PortAventura theme park in Spain. “From an art direction standpoint, not only was it spectacular in scale,” she says, “but it was stunning in its craftsmanship.”

Now, as president of Thinkwell Asia in Beijing, Ryner is charged with building a satellite design studio and creating a range of dramatic, content-rich attractions in China. For those projects, she’ll use the Thinkwell formula of seamlessly weaving together the arts and technology.

“The arts and technology blend and make each other stronger,” Ryner says. “When put together just right, magic happens. Every day at Virginia Tech, we were leveraging technology to tell a story. We do the same at Thinkwell—just on a much bigger stage.” ■

PHOTO: COURTESY OF THINKWELL

BLEAK HOUSE: Tom Bagamane unpacks blankets for the homeless of Los Angeles. "The street is their home," he says, "and for many, this is where they will spend the rest of their lives."

# *The Giving* **S** *pirit*

An entrepreneur takes his university's service ideals to the streets of Los Angeles to comfort the homeless.

*by Paula Byron*



**I**T BEGAN WITH A DRIVE THROUGH THE NATION'S CAPITAL one frigid winter evening. Minutes after passing the White House and the Treasury Building, Tom Bagamane could see homeless men and women, their shapes nearly indistinguishable in the shadows, huddled for warmth on the city's steam grates. Suddenly Bagamane felt a surge of fury.

"Here I was, surrounded by great monuments to democracy in one of the richest countries on earth," he says. "And yet people were freezing. I thought, *enough!*"

Bagamane turned to a fellow Hokie—his sister, Kalpana, an industrial engineering graduate—for ideas. Together they returned to the darkened street. There they draped wool blankets over the sleeping forms, placed food and water nearby, and disappeared into the cold night.

"When those people awoke," Bagamane says, "we wanted them to realize that someone had tucked them in, left them nourishment, and cared about them."

### THE HELP OF FRIENDS

The memory of that long-ago night never left Bagamane, who graduated from Virginia Tech in 1983 with a degree in communication and political science. In 1999, three years after making Los Angeles his home, Bagamane founded The Giving Spirit, a nonprofit that provides the homeless with survival assistance for life on the streets.

Los Angeles has one of the largest homeless populations in the United States, with nearly 50,000 displaced people countywide, most of whom are unsheltered.

The Giving Spirit launched with four volunteers. Now one of the largest all-volunteer organizations in the country, it has already engaged more than 13,000 volunteers in helping nearly 45,000 men, women, and children living on the streets.

**THE BARE NECESSITIES:** Tom Bagamane gives the homeless survival kits because he doesn't want them to have to choose between a hot meal and a toothbrush or pair of socks.



**W**hen those people awoke," Bagamane says, "we wanted them to realize that someone had tucked them in, left them nourishment, and cared about them."

Powered by all those helping hands, The Giving Spirit buys goods in bulk from discount stores, collects donated items from manufacturers and distributors, and assembles and delivers survival kits to the homeless from Skid Row to Santa Monica and the valleys beyond. Each kit contains dozens of individual items, including sunscreen, socks, pillows, and protection from the weather. The kits are seasonal, with backpacks tailored for summer and duffel bags for winter.

"At a time they feel the most alone, we provide them with food, water, blankets, clothing, toiletries and, most important of all, hope," Bagamane says. "We're always told, 'Before you came, I had no idea where my next meal was coming from,' or, 'I thought I'd been forgotten. Thanks so much for remembering me.'"

### BRINGING IT HOME

It's the outreach part of its mission, Bagamane says, that makes The Giving Spirit such an excellent teaching tool for families.

"Volunteering with us teaches people not to stereotype others based on where they live," he says. "Their hands-on experiences make homelessness real to kids and parents alike."

Bagamane says he, too, has had an awareness shift. "The homeless population of L.A. includes more babies, single mothers with kids, and teens than I'd realized," he says. "Many are working parents who live in cars, tents, or boxes. They don't litter or fuss; their kids attend school. Or they're veterans who served their country. But society has cast them aside. It's terrible we allow this to happen."

The Giving Spirit is always finding new challenges, Bagamane adds. "Recently, a friend and I spent a day hearing about struggles on the street. To our dismay, even with a returning economy, we found many folks who had been recently displaced, with nowhere to turn. Many are eager to return to the workforce but can't find employment. Others have been turned away by an overloaded system. Those with jobs can't afford to rent in one of the world's most expensive cities."

### GOOD BUSINESS

"I'm a capitalist by day and a philanthropist by night," Bagamane says. He began his career in the retail industry, with emphases on product development, sales, and marketing. Eventually, he followed his entrepreneurial instincts by launching two highly successful pet product companies, both of which have since been sold. All told, he has participated in branding and launching more than 40 consumer products sold around the world.

Even his commercial ventures have included a greater-good component; with his second company, he established the pet food industry's first "buy one, give one" profitable social-business platform.

More recently, Bagamane serves as managing director of the Profitable Good Group, which helps businesses implement social-impact strategies.

"We looked at corporate social responsibility and knew from experience that social change can have legs only if it's tied to a company's bottom line," he says. "We help companies define a purpose that brings shared value—one embedded in

their financial statements—as a strategy to guarantee sustainability in the good they're achieving."

### AT YOUR SERVICE

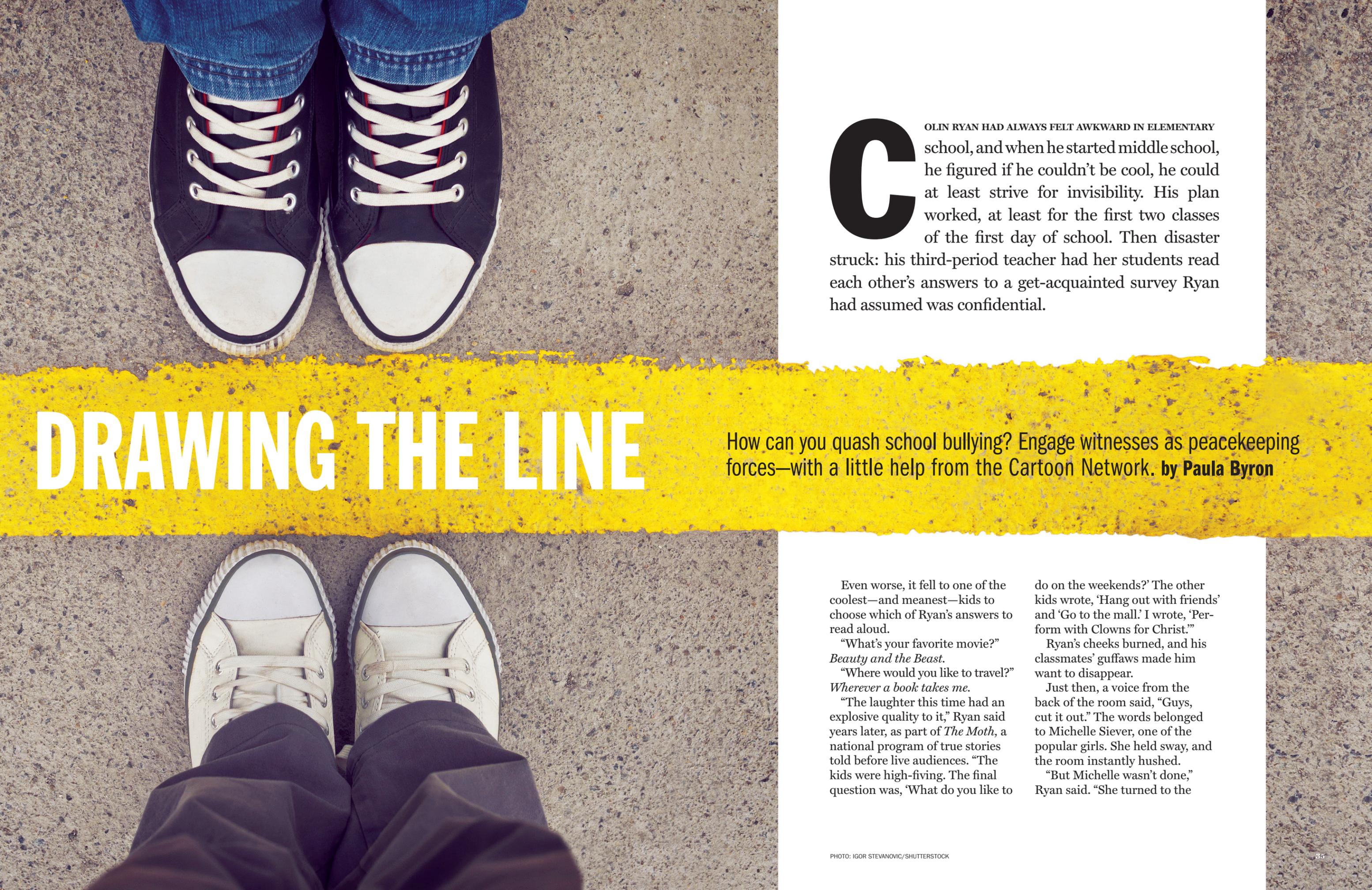
Bagamane says that Virginia Tech's motto—*Ut Prosim* (That I May Serve)—resonates with him.

"We're given opportunities every day to make a difference in other people's lives," he says. "When I founded The Giving Spirit, I thought, if this helps just one person, it will be worthwhile. It's since helped tens of thousands of people. But what I didn't envision is how the work would return so much richness to me, and to all our volunteers, especially the kids. We're simply caretakers of children's future. They can choose to eradicate homelessness if we create awareness now."

The most rewarding part, Bagamane says, is the time spent with people living on the street. "When they start opening up to us," he says, "it's like watching snow melt off a beautiful tree that's been covered for so long. When you learn their life stories, it can take your breath away." ■



**LIFE LESSONS:** The Giving Spirit volunteers find they receive more than they give when they meet those living on the streets.



# DRAWING THE LINE

How can you quash school bullying? Engage witnesses as peacekeeping forces—with a little help from the Cartoon Network. **by Paula Byron**

**C**OLIN RYAN HAD ALWAYS FELT AWKWARD IN ELEMENTARY school, and when he started middle school, he figured if he couldn't be cool, he could at least strive for invisibility. His plan worked, at least for the first two classes of the first day of school. Then disaster struck: his third-period teacher had her students read each other's answers to a get-acquainted survey Ryan had assumed was confidential.

Even worse, it fell to one of the coolest—and meanest—kids to choose which of Ryan's answers to read aloud.

"What's your favorite movie?"  
*Beauty and the Beast.*

"Where would you like to travel?"  
*Wherever a book takes me.*

"The laughter this time had an explosive quality to it," Ryan said years later, as part of *The Moth*, a national program of true stories told before live audiences. "The kids were high-fiving. The final question was, 'What do you like to

do on the weekends?' The other kids wrote, 'Hang out with friends' and 'Go to the mall.' I wrote, 'Perform with Clowns for Christ.'"

Ryan's cheeks burned, and his classmates' guffaws made him want to disappear.

Just then, a voice from the back of the room said, "Guys, cut it out." The words belonged to Michelle Siever, one of the popular girls. She held sway, and the room instantly hushed.

"But Michelle wasn't done," Ryan said. "She turned to the

## SHOW AND TELL

# 1

Ask someone in authority—a school administrator, teacher, or parent—to intervene.

# 2

Remove yourself as a passive participant. Say to your friends, “This isn’t something we should be watching.”

# 3

Show the victim support through words and deeds.

teacher and said, “Why are you letting this happen? What is the point if we’re just going to make fun of each other?”

Decades later, that moment remains etched in Ryan’s memory. He can’t recall the teacher’s name or the other students’ names, but he remembers Michelle Siever’s name, and how it felt when she rescued him.

For sociologist Anthony Peguero, such a story is more than a timeworn tale of school taunting. It also represents a promising strategy for changing the dynamics of bullying.

### SCHOOL OF HARD KNOCKS

The World Health Organization has declared bullying a significant public health issue internationally. Bullying behaviors range from emotional aggression—such as humiliation, harassment, threats, social exclusion, and online attacks—to physical abuses, including hazing, sexual assaults, and deadly violence.

“Despite the seriousness of school bullying, many people dismiss its impact as exaggerated,” said Peguero, an associate professor of sociology at Virginia Tech. “The sentiment tends to be, I got through it, and I turned out just fine. Yet not everyone has the same level of sensitivity or response to injury.”

In fact, bullying can have lasting effects on victims and aggressors alike. One meta-analysis found that victims of school violence are up to 50 percent more likely to face depression, even decades later. A study from the United Kingdom found that victims face a 10 percent increased risk of inflicting brutality on others later in life; for bullies, the ultimate risk of perpetrating violence doubles.

### BEARING WITNESS

The dynamics of school bullying tend to be more complex, Peguero said, than the interplay between aggressor and victim. Research suggests that as many as 85 percent of students have witnessed bullying, whether on the playground, on the bus, in the classroom, or online. These bystanders often unwittingly play a role—and their very presence may hold the key to altering bullying scenarios.

“The only way to stop a culture that accepts bullying as a natural rite of passage is to impress upon kids and teens that it’s unacceptable behavior and they have a social responsibility to intervene,” Peguero said. “There are proven tactics that bystanders can use to interrupt and even stop bullying situations.”

Peguero has helped articulate those tactics as a founding member of the Cartoon Network’s Bullying Prevention Advisory Board.

Principally aimed at 7- to 15-year-olds, the Cartoon Network is home to such animated favorites as *Teen Titans Go!* and *Adventure Time*. With the help of the advisory board, the network has leveraged its influence among children and teenagers with a program aimed at educating and empowering bystanders to take action to mitigate bullying.

Launched in 2010, the “Stop Bullying: Speak Up” program is geared toward middle schools, where bullying tends to be most rampant. Anti-bullying messages are woven throughout Cartoon Network shows, popular actors do public service announcements, and discussions of bullying are offered on multiple platforms. The website features videos, downloadable posters, educator guides, and parental tip sheets. Kids are encouraged to take a pledge against bullying, and they can earn game badges.

Most important, Peguero said, “Stop Bullying: Speak Up” offers witnesses appropriate techniques to intervene: tell an adult, avoid the appearance of tacit approval, and be supportive of victims.

“First, get someone in authority—a school administrator, teacher, or parent—to intervene,” Peguero said. “Second, remove yourself as a passive participant. Say to your friends, ‘I’m not going to watch this,’ or, ‘This isn’t something we should be watching.’”

When a crowd forms, Peguero added, the bully and the victim suddenly become performers in a drama. The goal is to disrupt that dynamic.

“We try to impress on kids that when they’re passive witnesses, their passivity implies acceptance,” Peguero said. “In fact, the very presence of witnesses can egg a bully on.”

The campaign also seeks to reframe the bystander’s role. Reporting bullying to an adult is not snitching; it’s speaking up for the victim. And friendliness to victims during and after bullying can both alleviate its harmful effects and signal to aggressors that such behavior will not be tolerated. Even a few kind words can make an enormous difference to victims, as can reassurances that the bullying is not their fault.

Peguero added the campaign does not advocate that witnesses intervene physically, as that may place them at risk.

“We were very deliberate in our development of the slogan,” Peguero said. “We chose ‘speak up,’ not ‘stand up,’ because we didn’t want to imply that bystanders should respond physically. Instead, we advocate words that acknowledge that certain behaviors are unacceptable.”

### SPECIAL VULNERABILITIES

As part of their work with the program, Peguero and his fellow board members consult on the scripts for public service announcements, commercials, and individual shows. For the entertainment programming, they try to inject nuanced messaging about bullying while respecting the network’s need to keep shows engaging.

His primary contributions to the scripts, Peguero said, are twofold. As an academic, he helps identify the most appropriate messages and places them in context: are they driven by scholarship or merely swayed by opinion? And, as a sociologist specializing in the risk factors of victimization, he raises critical issues at the core of bullying.

“Bullying isn’t equally distributed across school populations,” he said. “Bullies often choose their victims based on race, ethnicity, socioeconomic status, sexual orientation, ability, gender, or immigration status. Some groups—such as lesbian, gay, bisexual, and transgender youth; those with disabilities; and those who are socially isolated—tend to be at the highest risk of being bullied. I focus on those inequalities.”

Peguero also examines the implications of bullying that extend beyond the actual abuse. “Bullying can trigger more deep-seated and emotional issues for victims, causing school attendance and performance problems,” he said. “How can a child focus on history if she’s worried about her safety?”

As part of his research, Peguero consults with schools on ways to create healthy learning environments.

“Having a school with great educational opportunities and kids with good relationships with their teachers and each other always reduces the level of bullying,” Peguero said. “Yet the pursuit of safety has changed the learning environment. The easiest thing for schools to do is hire a security guard, as it’s a highly visible action that appeases parents and reassures communities.”

In some cases, Peguero said, the emphasis on school security has led to the criminalization of students. Schools with zero-tolerance policies tend to expel students, even for minor offenses. Such harsh responses not only disrupt the students’ education, but they also populate what is widely decried as a school-to-prison pipeline.

“Should gum-chewing and the subjective act of ‘being disrespectful’ lead

to the same harsh punishment as instigating a cafeteria brawl?” Peguero asked. “Punishing students instead of resolving issues skirts the real problems. Zero-tolerance policies remove administrative flexibility. Instead, administrators need to have multiple options for striking a balance between making kids feel safe and providing them with a good education.”

### ACTION HEROES

Peguero views the Cartoon Network’s anti-bullying program as an important complement to schools’ efforts to end a pernicious problem.

“The network has made its program multiplatform, diverse, global, and—most critical of all—enduring,” he said. “Network leaders have recognized that bullying needs to be part of everyday programming, that the issue is too important and pervasive to be relegated to the occasional afterschool special.”

The benefits of advocacy for victims will likely have lasting impact, as Colin Ryan discovered when Michelle Siever spoke up for him so many years ago.

“You can be cool, and you might be remembered for a little while,” Ryan said. “You can be invisible, and you won’t be remembered at all. But if you stand up for somebody when they need you most, then you will be remembered as their hero for the rest of their life.” ■



**WATCH AND LEARN:** As part of his work with the Cartoon Network, Anthony Peguero helps finesse anti-bullying messages in television scripts.



# why we're here

by Sarah Benson

As she looks to her future, a newly admitted student reflects on her family's past.

**M**Y FATHER TAKES ME DOWN to the arroyo when I am so small that I do not yet reach his waist. My feet fumble across flaking desert skin and he pulls me along gently by my hand and tells me to be careful of small cacti and the bones of dead jackrabbits. He does not let me straddle the rift where the earth divides into repelling mounds of sand. Instead, he slips his hands beneath my arms and swings me around in a half circle, his red face wrinkling into a smile.

That morning, my father had crept into my room with the sun and shaken me into consciousness. "Get your sneakers," he had whispered. "We're going on a treasure hunt."

It is minutes later now and we are trudging down an overgrown trail, tactfully descending the deep slopes of New Mexican land. Everything smells strongly of mud and salt and soaked manure from the horse barn down the road. I almost trip over a weed, but my father steadies me and says, "Almost there, baby."

The arroyo is different than I have ever seen it. It is scattered with long, silver puddles. In the pink glow of the rising sun, the sand looks shiny and slippery. Around us, green tufts of vegetation burst from the earth in unpredictable patterns and yellow wildflowers with thin stems knock softly against each other in the wind.

My father tells me to wait and he steps down into the wet sand. I watch as his sandals sink deep into the ground and leave long footsteps. He crouches suddenly, and digs into the earth with a discarded stick. Then he stands, approaches me, and places in my hand something slimy and smooth.

"A pottery shard," he says, in explanation. "From the Native Americans, who lived right here a thousand years ago. The rain washes them up. If we're lucky, we'll find all the pieces of an entire pot."

I look down at the strange triangular stone and wipe the sand from its surface. He lifts me up in his arms, carries me back toward the house.

My father gives me a book about Georgia O'Keeffe for my fifth birthday. We read it together and he bounces me on his knee and licks his fingertips before turning the pages. He points at a landscape that looks like a rumpled tablecloth and tells me, "This is why we're here." I steal a flashlight and flip through the book under my covers at night. I touch the same glossy picture and whisper, "This is why we're here."

When I am six years old, the Sunday school teacher asks me what my father does for a living. I tell her he is an artist like Georgia O'Keeffe. I do not know that I am lying. I do not know that he hasn't sold a piece in months. I do not know that my mother sits at the kitchen table after I go to sleep and cries because the mortgage is past due and she can't figure out a way to tell me that this year, Santa Claus just might not make it.

For Christmas, my father gives me a sparkling blue stone he found in the arroyo. I say thank you and pretend I mean it. Later, I stand on the edge of our brick patio and wind up my arm and throw the rock as far as it will go. It disappears inside the bristles of a pine tree.

I do not say goodbye to the arroyo before shutting the car door and stretching the seatbelt across my chest. I do not say goodbye because I think that I won't miss it. We are leaving New Mexico. We are going to New York, where my father will get a real job and we will become a real family. We drive alongside a cliff, the rock rough and jagged and sprinkled with a thousand tiny diamonds. I press my finger against the glass. *This is why we're here.*

When I am 16 years old, my father takes me back to New Mexico and we go once more to the arroyo. The neglected trail is long gone now and we stumble in our tennis shoes over dried-up cacti and colorless desert flowers. I am too old now to hold my father's hand. He walks a few steps ahead of me and I do not see his face.

The arroyo is bone-dry, littered with dented soda cans, beaten strips of tire, and mud-stained garbage bags. Many monsoon seasons have left the sides of the arroyo tall and smooth, except for the dried roots of long-dead plants, still lodged in the dirt, which reach out toward us like skeleton hands.

My father crouches over and his shirt draws taut across his back. He delicately parts the earth with his fingers and searches for something that he will never find again.

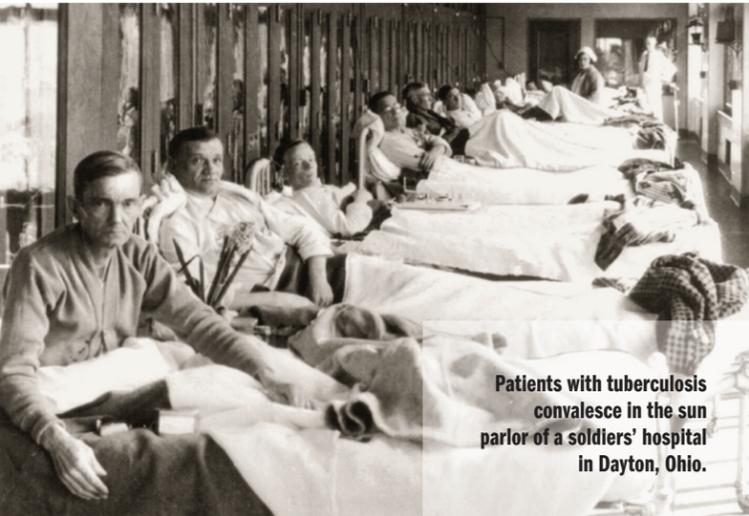
"No more pottery," he says. He looks at me and squints his eyes against the sun. "It must have washed far away by now."

Suddenly comes to me the vague image of my father in ripped jeans, pressing a pottery shard into my palm.

I wonder if he, too, has washed far away. ■

*Sarah Benson '20 is majoring in literature and language at Virginia Tech. This essay was one of four to win the national New York Times college admissions essay contest for 2016.*

# History Repeating *The Past Is Prologue*



Patients with tuberculosis convalesce in the sun parlor of a soldiers' hospital in Dayton, Ohio.

## A Deadly Contagion

When Howell Edmunds Jackson, a U.S. Supreme Court associate justice, died in 1895, his death drew national attention, in part because of the recency of his impassioned defense of the constitutionality of income tax.

For a team of researchers, though, the cause of Jackson's death was more notable than his judicial legacy: It was yet another example of the significance of tuberculosis in American history.

The team members—students and recent graduates from Virginia Tech, George Mason University, and the University of Virginia—are applying research techniques from the humanities, social sciences, and data analytics to understand the significance of tuberculosis, the greatest single cause of death in the United States between 1870 and 1920. They presented their findings at the Woodrow Wilson International Center for Scholars in Washington, DC, in July 2016, and then again in Bethesda, Maryland, at the invitation of the National Institute for Allergy and Infectious Diseases.

**RELEVANCE TODAY:** “New digital tools are allowing us to capture details of an epidemic that, at its height, claimed the lives of more than 100,000 Americans every year,” says project director E. Thomas Ewing, a Virginia Tech history professor. “The history of tuberculosis provides insights into the ways that communities, families, and individuals living with the threat of chronic disease are also shaped by the power of cultural values, the constraints of social relations, and the evolution of medical understanding.”

## Sleep, Interrupted

Before the Industrial Revolution, people slept differently than we do today. “The nighttime slumber to which we aspire, not always successfully, is consolidated,” says Roger Ekirch, a Virginia Tech history professor. “But the dominant form of sleep from time immemorial has consisted of segmented sleep.”

Combing diaries, medical texts, and court records, Ekirch found more than 500 references in a variety of languages to a bimodal sleep pattern. The two intervals were bridged by an hour or more of wakefulness shortly past midnight, during which people did “anything and everything imaginable,” from reciting prayers to pilfering a neighbor's chickens.

“The way we sleep today,” says Ekirch, “is a remarkably recent phenomenon, the consequence of modern technology—bathing ourselves in electric light, which reconfigures the human body clock—coupled with cultural priorities that regard sleep as a necessary evil.”

**RELEVANCE TODAY:** A growing number of sleep specialists have embraced Ekirch's findings, suspecting a link between insomnia and segmented sleep. For insomniacs awakened in the dead of night, simply knowing of this older, more natural sleep pattern may soothe anxiety and ease their ability to fall back to sleep.

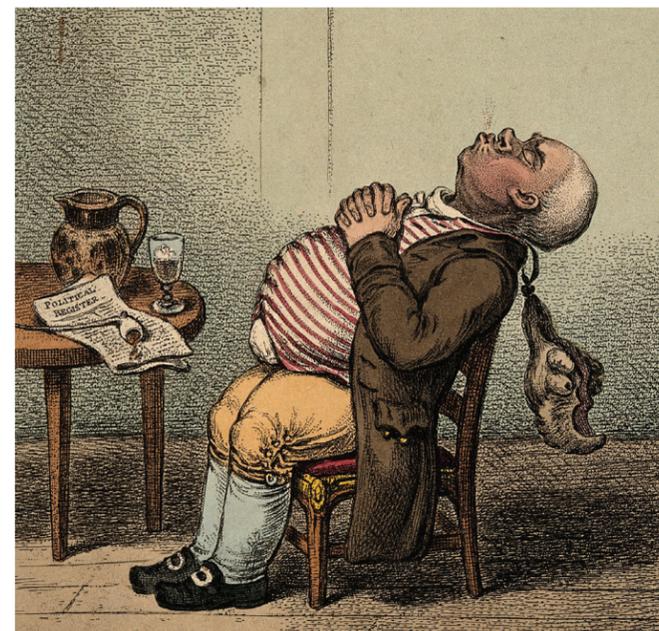
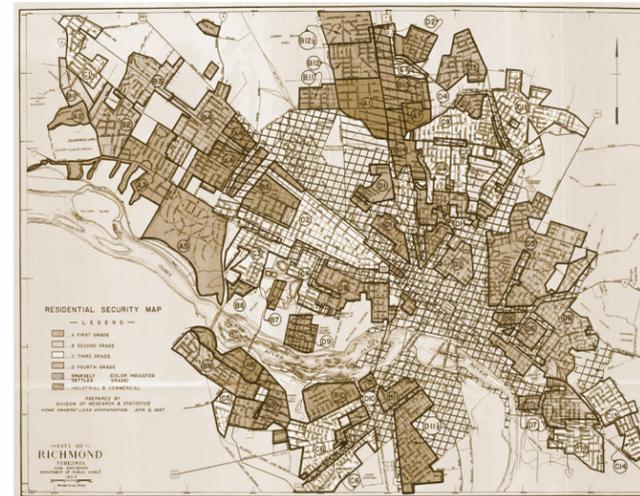


PHOTO: COURTESY OF THE LIBRARY OF CONGRESS (TOP LEFT); COURTESY OF WELLCOME IMAGES (ABOVE)



A 1938 Home Owners' Loan Corporation map depicts housing zones in Richmond, Virginia.

## Blocks of Shame

During the Great Depression, the Home Owners' Loan Corporation, one of the New Deal's most important federal agencies, paid \$3 billion to refinance an estimated one million mortgages, about one-fifth of all mortgages in the metropolitan United States at the time. The agency was also responsible for a practice known as “redlining”—steering capital away from African Americans and reinforcing urban poverty.

LaDale Winling, an assistant professor of history at Virginia Tech, has joined with colleagues at Johns Hopkins University, the University of Maryland, and the University of Richmond to launch *Mapping Inequality*, an online repository of more than 200 interactive maps from the 1930s and 1940s.

“The Home Owners' Loan Corporation has long been seen as both a savior to the housing sector and a force for racial segregation,” Winling says. “*Mapping Inequality* introduces viewers to the agency's historical records on an unprecedented scale. Visitors can get a view of Depression-era America as developers, realtors, tax assessors, and surveyors saw it—a set of interlocking color-lines, racial groups, and environmental risks. These maps reveal their evaluations of ‘good’ and ‘bad’ neighborhoods.”

**RELEVANCE TODAY:** “Redlining continues to have repercussions for present-day inner cities,” Winling says. “Visitors to *Mapping Inequality* can use the maps and area descriptions to draw connections between past state actions—and inactions—and contemporary issues in the United States.”

IMAGE: COURTESY OF THE LIBRARY OF CONGRESS (RIGHT)

## Independence, Revisited

During the Civil War era, differences in response to Fourth of July commemorations became magnified. When the war ended, African Americans found new resonance in Independence Day, northerners used the holiday to celebrate the Union's victory, and many white southerners stopped celebrating the holiday for years or, in some cases, even decades.

“The Fourth became a day to argue about who counted as an American and what that meant,” says Paul Quigley, director of the Virginia Center for Civil War Studies. To foster insights into that volatile period, Quigley has joined with David Hicks, a professor in the School of Education, and Kurt Luther, an assistant professor in the Department of Computer Science, in launching *Mapping the Fourth of July in the Civil War Era*, a crowdsourced digital archive of primary sources.

“We wanted to understand how Americans celebrated Independence Day even as their nation was falling apart,” says Quigley, the James I. Robertson Jr. Professor in Civil War Studies in Virginia Tech's Department of History. “We realized the answer lies in the tens of thousands of Civil War-era sources, from newspaper articles and speeches to private letters and diaries.”

**RELEVANCE TODAY:** Quigley believes the website can spark thoughtful discussions on issues of race, citizenship, and identity. “It was on one particular day each year that a range of Americans—northerners and southerners, whites and blacks, women and men, immigrants and native born—gave voice to typically unspoken beliefs about national identity,” he says. “*Mapping the Fourth* invites visitors to discover the meaning of Independence Day not just for the generations who lived through the Civil War, but for themselves as well.”



A wood engraving captures the Fourth of July celebration of the Union-controlled Camp Hamilton in Hampton, Virginia, in 1861.

# Great Expectations

Outstanding Recent Alumna



**SPECIAL EVENT:** Liz Hart is used to arranging every last detail, but one moment she did not plan took place on stage before the Democratic National Convention started, when her sweetheart, Andrew Binns, dropped to one knee. She said yes.

## Storytelling in Motion

From the Vancouver Winter Olympics to the Democratic National Convention, this event producer remains game.

FOR EVENT PRODUCER LIZ HART, no challenge is too daunting and no detail too insignificant. Help erect a temporary theme park to entertain 14,000? No problem. Cue an Olympian to light a torch in a packed arena? Got it.

In a relatively short time, Hart, who earned her communication degree from Virginia Tech in 2007, went from planning her high school prom to serving as director of the media studio for the recent Democratic National Convention.

For her considerable accomplishments within a decade of graduation, Hart has received the 2016 Outstanding Recent Alumnus Award of the College of Liberal Arts and Human Sciences.

Her firm, Liz Hart Event Consulting and Design, specializes in live event and broadcast production, event décor and styling, stage management, and story development. Her clients range from national political figures to top entertainment companies, high-profile charitable organizations, and event production companies.

“Every evolution of my career has called on what I learned at Virginia Tech,” Hart says. “I chose the university because the communication department was willing to help me design a dream curriculum for special events, everything from multimedia journalism and marketing to visual design and theatre.”

For Hart, events offer exquisite vehicles for communication. “Successful events involve storytelling,” she says. “What do you want to communicate? What do you want your audience to experience? For me, starting with an empty stage set is like painting on a stretch of white canvas or writing on a blank page.”

Hart’s credits include the Vancouver Winter Olympics, New York Fashion Week, Macy’s Thanksgiving Day Parade, and television specials ranging from a Justin Bieber roast to an HBO special that brought artists and celebrities together to honor U.S. veterans. Hart has also been a producer on the official livestreamed Times Square New Year’s Eve Ball Drop every year since 2012.

Her work extends beyond major events planning into the political arena as well. As an advance staffer, her international work spans more than 20 countries. In 2014, she served as director of message events



ADVANCE GUARD: Liz Hart briefs Vice President Joe Biden and his sister, Valerie Biden Owens, before entering a civil rights leaders’ luncheon in Selma, Alabama, in 2013.

in Vice President Joe Biden’s communications office at the White House, crafting events and press logistics around administration policy.

Yet Hart’s greatest challenge came early, less than a month before she was slated to graduate. Immediately after the April 16, 2007, shootings at Virginia Tech, she was called on to help her university community as a member of Hokies United, an alliance of Virginia Tech student organizations that band together to assist those in need.

Within a day of the shootings, Hokies United had organized a candlelight vigil, spirited 32 Hokie stones from a nearby construction site to erect a Drillfield memorial for each victim, and built

whitewashed plywood memorial walls on which condolences could be written.

Hokies United also granted interviews to hundreds of media who requested student reactions. Hart, as the alliance’s director of media relations, had the sad role of serving as the student body spokesperson.

“We were struggling with shock and grief, but at the same time we wanted to help the university,” she says. For years afterward, Hart and her classmates would gather on the anniversary of the tragedy to help each other heal.

“April 16 was a devastating part of our university’s history, yet not its only history,” she says. “We’ve been changed but not defined by it.”

Hart adds that her experiences in 2007 will always be part of her life’s tapestry.

“When I went to interview in Vice President Biden’s office,” she says, “I saw, on the wall above my chair, a photo of the vice president gazing at the Hokies United plaque. It felt like an alignment of the universe. I knew I was making the right decision to work there.”

Her instincts have always served her well, Hart says, as has her zest for the next great adventure.

“I’m prepared and constantly open to new possibilities,” she says. “I wake up every day ready to meet someone interesting or be able to help with something unexpected.”

### RIISING TO THE OCCASION

Liz Hart’s portfolio includes televised and livestreamed events, large-scale productions, behind-the-scenes management of performances, political events, stage management, and scenic builds.

**2010**  
Assistant Stage Manager  
Vancouver Winter Olympics

**2012**  
Member, Street Operations  
Macy’s Thanksgiving Day  
Parade (2012–14)

**2012**  
Supervising Producer and Script  
Writer, Official Web Show  
Times Square New Year’s Eve  
Ball Drop (2012–16)

**2013**  
Assistant to Executive Producers  
57th Presidential Inaugural Balls  
and Kids’ Inaugural Concert

**2013**  
Production Assistant  
The Victoria’s Secret  
Fashion Show

**2014**  
Director of Message Events  
Office of the Vice President,  
The White House

**2015**  
Production Manager  
2015 Nickelodeon  
HALO Awards

**2016**  
Director of Studio  
Democratic National  
Convention



**AS GOOD AS GOLD:**  
“Bronze actually feels like gold to me,” Kristi Castlin said in an interview after winning her Olympic medal.

## Hurdling into History

In a split second—two-hundredths of a second, to be exact—Kristi Castlin made both Olympic history and Virginia Tech history.

Castlin won a bronze medal in the women’s 100-meter hurdles at the 2016 Summer Olympic Games held in Rio de Janeiro, sweeping the event along with U.S. teammates Brianna Rollins, who took the gold, and Nia Ali, who won the silver. The sweep—the first time in Olympic history that one country has owned the 100-meter hurdles—was made possible by Castlin’s lean across the finish line, which *USA Today* deemed “incredible.”

Castlin also became the first female Virginia Tech graduate to medal at the Olympics and the first Hokie to claim an Olympic medal since former men’s basketball

standout Vernell “Bimbo” Coles took a bronze in 1988, two years before graduating with a degree in housing, interior design, and management.

Since returning from Rio, Castlin has been traveling at high speed. She received recognition in her home city of Atlanta, participated in tennis star Serena Williams’ fashion show during New York Fashion Week, accepted an invitation to join the gun-control coalition of former Arizona Congresswoman Gabrielle Giffords, and made appearances on national television.

“It definitely feels good,” Castlin says. “I’m happy to be a medalist, and I’m excited about the future.”

In September, Castlin visited Virginia Tech, where she earned her political science degree in 2010, to watch the Hokies’ football game against Boston College. During the first quarter, the athletics department led the crowd in recognizing her Olympic honor.

Castlin is accustomed to hearing crowds cheer. In 2007, she became the first Tech female athlete to win an Atlantic Coast Conference championship in a hurdles event. She graduated with seven All-America honors from the National Collegiate Athletic Association, the most by a female athlete in Virginia Tech history.

She also helped the university earn a reputation as a competitive track and field school.

Castlin hopes to make the U.S. Olympic Team in 2020.

“I’m training for next year’s World Championships in London,” she says. “Then, four years from now, I want to be on the Olympic team for Tokyo. After that, I see myself competing for one more year.”

After she clears her last competitive hurdle, Castlin will consider a range of options, including international affairs, modeling, consulting, and social work.

In the meantime, she’ll be traveling many places. Fast, of course. It’s the only way she knows. —*Jimmy Robertson*

PHOTO: COURTESY OF VIRGINIA TECH ATHLETICS

## REPORTING FROM RIO



**HODA KOTB** is accustomed to sizable audiences, but in August 2016, she gained the largest of her career, as an estimated 30 million viewers watched her co-host the opening ceremony of the Rio Olympics for NBC. Kotb joined co-anchors Matt Lauer and Meredith Viera in providing commentary during the Parade of Nations.

Also while in Rio, Kotb reported on the Olympics for NBC Sports and co-hosted the *Today* show. She is usually seen on morning television as the co-host of the fourth hour of the *Today* show, a role she has served since 2007.

Kotb joined NBC News as a correspondent in 1998, just a dozen years after earning her communication degree from Virginia Tech.



PHOTOS: JEN LONG/TODAY (KOTB); MORGAN MCCAFFREY (WESH); RALPH LAUER/CLIBURN FOUNDATION (CRAIG)



## Taking the Heat

Darrell Wesh represented his parents’ home country of Haiti at the Rio Olympics. There he competed in the 100-meter dash, an event for which he holds Haiti’s record.

“It was such an honor to be in Rio among the world’s best athletes,” he says. “I found my fellow Olympians to be humble people who happen to have extraordinary ability in their sport.”

Wesh’s own extraordinary ability was clear in high school, when he was the national champion in the 60-meter dash and runner-up in the 100. At Virginia Tech, where he earned a human development degree in 2015, Wesh was named an All-American four times. In 2013, he became the first Hokie to win the Atlantic Coast Conference title in the 200; his best in the 60 and 100 remain school records. Now a sprinting coach at Tech, he is aiming for the 2020 Summer Olympics.

## KEYS TO SUCCESS

**JEANNE BACKOFEN CRAIG**, who earned her music degree from Virginia Tech in 1991, was one of a dozen semifinalists in the Seventh Cliburn International Amateur Piano Competition, held in Fort Worth, Texas, in June 2016. In the semifinal round, she performed, to rave reviews, Brahms’ Intermezzo in A Major, op. 118, no. 2, and Liszt’s “Vallée d’Obermann” from *Années de Pèlerinage* and Hungarian Rhapsody no. 11 in A Minor.

The prestigious competition is open to non-professional pianists who do not derive their principal source of income through piano performance or instruction. Craig, who has perfect pitch, serves as a minister of music and liturgy in Forest, Virginia.

# Word of Honors

## ////// Awards and Other Recognition

**a. Jeanne Centracchio DaDamio** (French '75, MA education '76), of Vienna, Virginia, received a 2016 Alumni Distinguished Service Award from Virginia Tech. A 1985 recipient of the university's Outstanding Young Alumni Award, DaDamio served on the Alumni Association Board of Directors from 1977 to 1989 and from 2005 to 2011. She currently is a member of the Dean's Roundtable for the College of Liberal Arts and Human Sciences. She and her family established the Centracchio-DaDamio Family Global Leadership Endowed Scholarship. After a 33-year career with IBM, DaDamio retired as a senior program manager in the Global Business Services division.

**b. Laura DeNardis**, a professor and an associate dean in American University's School of Communication in Washington, DC, received the Virginia Tech Graduate School's 2016 Alumni Achievement Award. A globally recognized internet governance scholar, DeNardis earned her doctorate in science and technology studies from Virginia Tech in 2006. With a background in information engineering, she studies the social and political implications of internet technical architecture and governance.

**c. Katherine Allen**, a professor in human development at Virginia Tech, is the 2016 recipient of the Earnest W. Burgess Award. This biennial award of the National Council on Family Relations recognizes a scholar with a distinguished career in the field of family research. Her scholarship, the council noted, "represents a lifetime contribution that significantly advances critical areas of family research, assessment, and theory." Allen's expertise focuses on family diversity over the lifespan, including aging, ethnicity, gender, and sexual orientation within families.

**d. Mary Tackett** of Winchester, Virginia, was named one of two Virginia Tech Graduate School 2016 students of the year. Tackett is a doctoral candidate in the education, curriculum, and instruction program in the School of Education. She earned her master's degree in the same field and her bachelor's degree in English at Virginia Tech.



**e. Nneoma Nwankwo** of Lagos, Nigeria, who graduated in 2016 with a degree in political science, was named the 2016 Virginia Tech Undergraduate Student of the Year. Nwankwo minored in public and urban affairs and creative writing. Through the unique experience in pursuing service-oriented research on poor menstrual hygiene management in West Africa, she says, she found passion in working in the service of others. The honor, the most prestigious nonacademic undergraduate award at Virginia Tech, is bestowed on a student with exceptional and balanced achievement in academics, leadership, and service. The recipient exemplifies the qualities and values important to a Virginia Tech education, captured in the university motto, *Ut Prosim* (That I May Serve).

**g. Morgan Sykes** of Winchester, Virginia, was named the 2016 Outstanding Senior for the College of Liberal Arts and Human Sciences. Sykes served as the undergraduate representative to the Virginia Tech Board of Visitors; co-founded and served as president of the Virginia Tech chapter of Kappa Delta Pi, an international honor society to promote fellowship among future and current educators; and was a Student Government Association Cabinet representative. A Hokie Camp counselor and a Hokie ambassador, she also volunteered for College Mentors for Kids, Relay for Life, and the Big Event. She is now pursuing a graduate degree at Virginia Tech's School of Education.

**f. Jacqueline Bixler**, Alumni Distinguished Professor of Spanish and chair of the Department of Foreign Languages and Literatures, received the Outstanding Faculty Award of the 2016 State Council of Higher Education for Virginia, better known as SCHEV. The award, sponsored by the Dominion Foundation, is the commonwealth's highest honor for faculty in colleges and universities. Bixler teaches the Spanish language, in addition to Hispanic culture, literature, and film. The author of seven books, she is an internationally recognized scholar of contemporary Latin American theatre. She has received numerous teaching awards and is an inductee in the Academy of Teaching Excellence.

**h. Nikki Giovanni**, University Distinguished Professor of English, received the 2016 Literary Lifetime Achievement Award from the Library of Virginia. The award recognizes outstanding and long-lasting contributions to literature by authors with Virginia ties. Past recipients include Edgar Allan Poe, Rita Dove, Tom Wolfe, William Styron, Booker T. Washington, John Grisham, and Barbara Kingsolver. Known best for her poetry, Giovanni has long used her literary gifts to raise awareness of social issues, particularly those of gender and race. Giovanni has published more than two dozen volumes of poetry, essays, and edited anthologies, as well as 11 illustrated children's books, including *Rosa*, an award-winning biography of Rosa Parks. Giovanni's autobiography, *Gemini*, was a finalist for the 1973 National Book Award.

### UNIVERSITY FACULTY AWARDS FOR 2016

*These individuals received recognition for outstanding achievements in their fields*



**Joyce Arditti**  
Human Development  
Alumni Award for  
Excellence in Research



**Peter Graham**  
English  
William E. Wine Award



**Marian Mollin**  
History  
Carroll B. Shannon  
Excellence in Teaching Award  
and Alumni Award  
for Excellence in Teaching



**Zhange "Nicole" Ni**  
Religion and Culture  
Edward S. Diggs Teaching  
Scholars Award



WORK OF ART: Regina Dugan insists that artists have much in common with scientists and engineers. “I have a strong appreciation for art in general,” she once said. “In fact, I find that I crave those things in my life—music and art and poetry and dance.”

## The Alchemy of Creative Risk

Innovation requires a commitment to the future and an embrace of fear. **by Michael Stowe**

**T**HE BIGGEST OBSTACLE to innovation isn’t failure—that’s essential to solving difficult problems—but rather being paralyzed by the fear of failure, Virginia Tech alumna Regina Dugan told an audience of hundreds at her alma mater.

If you are working on a project you care about and you fail, it feels terrible, Dugan said. That scary feeling holds us back.

“I believe that we have to choose, actively choose, to be terrified,” she said. “I’m a little terrified pretty much every day. When we choose to be terrified, we share a vulnerability. And that vulnerability becomes our bond.”

“It is the bond that people who are associated with building the future of this university feel. It is not even when it’s a little terrifying. It’s rather precisely because it is a little terrifying. Because it is authentic and human and scary to dare and dream and do.”

Dugan, the leader of Facebook’s new advanced research group, known as “Building 8,” earned her bachelor’s and master’s degrees in mechanical engineering from Virginia Tech and went on to receive a doctorate from the California Institute of Technology.

She returned to Blacksburg to talk about rapid innovation as part of the university’s inaugural Beyond Boundaries Presidential Lecture series. Beyond Boundaries is President Tim Sands’ visioning initiative in which he challenged the university community to imagine Virginia Tech a generation into the future.

Before joining Facebook, Dugan ran Google’s Advanced Technology and Products Team. She is also the former head of DARPA, the Defense Advanced

Research Projects Agency. In 2013, CNN named her to its top 10 list of thinkers in science and technology who are “changing the world with their insights and innovations.”

Dugan stressed the importance for companies—and universities—to be forward thinking. “I’ve been fortunate to be part of many great organizations,” Dugan said. “I know that the best of them challenge the very notion that their past is what makes them great. Instead they use their history of accomplishment to give the confidence to change and look forward to the future. They seem to focus, always, on a future that can be even greater than their past.”

Dugan said innovation is a discipline that requires speed, agility, and the ability to change and adapt. “It’s a way of life,” she said. “It is something you can learn. It is something you can get better at. It is something you test, adapt, and change with the time. You treat it as a discipline and you get better.”



“It’s technology married with liberal arts, married with the humanities, that yields us the results that make our heart sing.”

—Steve Jobs, Legendary Innovator

“What important problem can be solved only by engineers who are trained only in engineering, or by poets who have mastered only poetry?”

—Tim Sands, President, Virginia Tech

“We stand at that intersection between wonder and knowing, between exploration and certainty, between imagination and invention.”

—Elizabeth Spiller, Dean, College of Liberal Arts and Human Sciences, Virginia Tech

## WHY

LIBERAL ARTS AND HUMAN SCIENCES AT VIRGINIA TECH?

The College of Liberal Arts and Human Sciences at Virginia Tech offers insights into the arts, humanities, human and social sciences, education, and military studies. Creativity, innovation, and a commitment to humanity are at the core of the college’s mission, helping to ensure that its students have the tools and perspectives they need to find meaningful solutions to complex human problems.

### THE UNIVERSITY

**No. 1**

Best Quality of Life and Most-Beloved University (Princeton Review)

**No. 2**

Happiest Students (Princeton Review)

**99%**

of Virginia Tech alumni would choose the university again

**Best Value**

in Public Education

(Kiplinger Personal Finance)

### THE COLLEGE

**No. 1**

Family and Consumer Sciences (USA Today)



**No. 2**

Human Development (USA Today)

**Top 2%**

Highest-paid sociology graduates nationally (USA Today)



**Top 20**

Best Value College for Humanities Majors (Payscale)

(Payscale)

### LIBERAL ARTS AND HUMAN SCIENCES



Philosophy majors are admitted into law school at a **higher rate** than any other major

**60%**

of chief executive officers in the United States hold degrees in the humanities

Classic studies majors earn the **highest scores** on entrance exams for medical, law, and graduate school



The mid-career salaries of history majors are **on par** with those of business majors



## ILLUMINATION

College of Liberal Arts and Human Sciences  
Virginia Tech  
Wallace Hall, Suite 260 (0426)  
295 West Campus Drive  
Blacksburg, VA 24061

NONPROFIT  
ORGANIZATION  
U.S. POSTAGE  
PAID  
BLACKSBURG, VA 24060  
PERMIT NO. 28

# *more* **to** give

*Hokies are a rare breed.  
We always find more to give—  
in the classroom, on the job,  
and in the community.*



### Meet Nneoma Nwankwo

Nneoma Nwankwo was named the 2016 Virginia Tech Undergraduate Student of the Year for her exceptional achievements in academics, leadership, and service both on campus and around the world. While a political science major, she conducted research on health issues facing girls and women in developing countries. “At Virginia Tech, I was challenged to live in service to others,” she says. “I learned how to lead boldly as I pursued my global development interests. Ultimately, I discovered that *Ut Prosim* (That I May Serve) is an active verb, and when I serve those around me, I create a meaningful life for myself.”

Students like Nneoma graduate ready to give more, thanks to those who give back to Virginia Tech.

Learn more about the power of philanthropy, and make a gift that will have an immediate impact, by visiting [givingto.vt.edu/moretogive](http://givingto.vt.edu/moretogive) today.

 **VirginiaTech**<sup>®</sup>  
College of Liberal Arts and  
Human Sciences