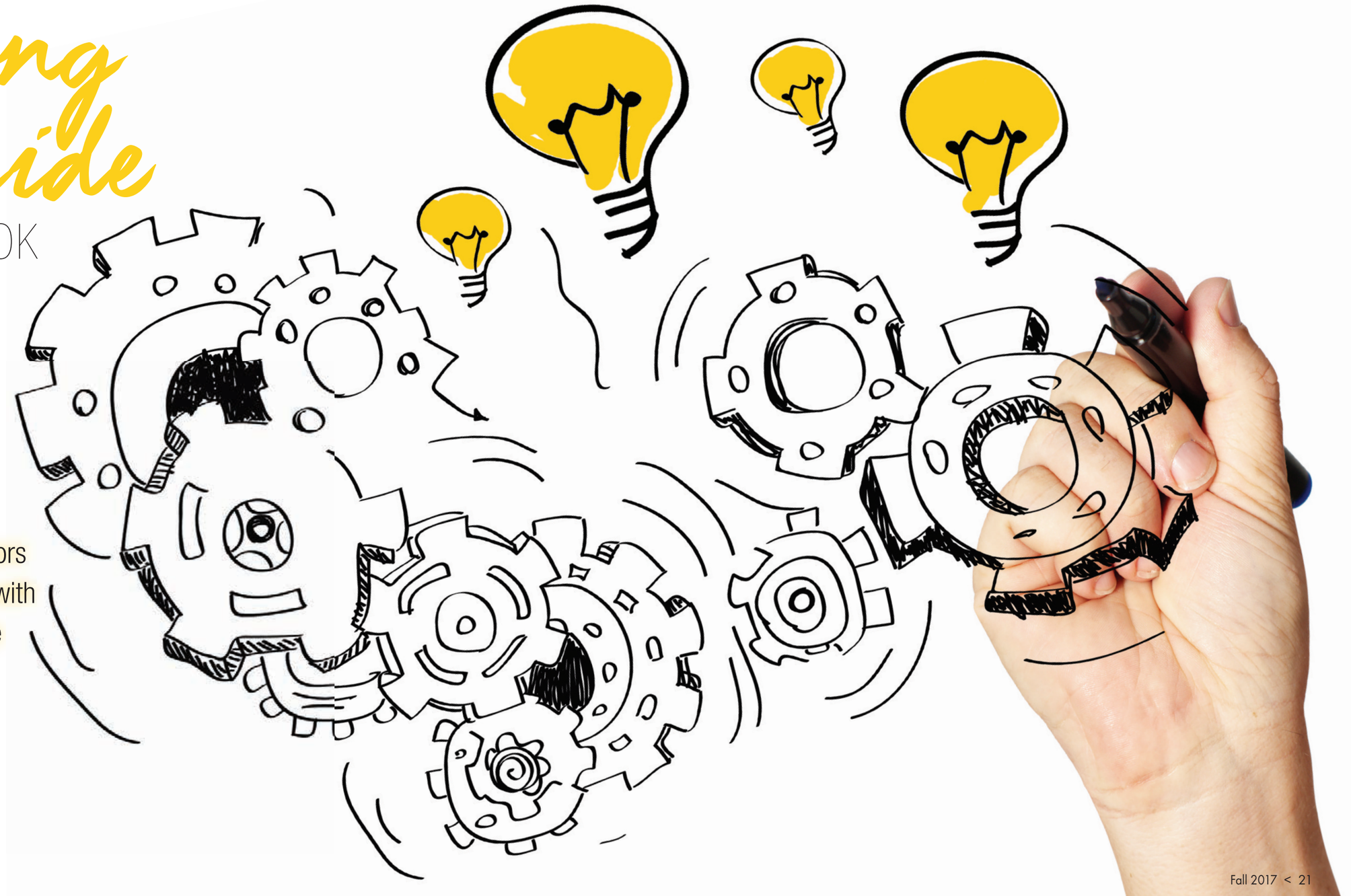
Teaching Outside THE TEXTBOOK

By Katie Bahr and Catherine Lee

Catholic University faculty know that students who love learning will carry a passion for their chosen field into the real world. That's why professors in all disciplines are teaching with inspiration, creativity, and pure innovation. Here we highlight a few of the many faculty members who are thinking outside the box.



APPLYING AN ANCIENT ART IN NEW WAYS

Otto Wilson, associate professor of biomedical engineering

In an engineering class last spring, first-year students spent an hour learning an ancient building method: origami, the Japanese art of paper folding. After distributing a variety of colorful Post-it notes, Otto Wilson patiently explained how to fold them into pentagon-hexagon zig-zag units, or PHIZZ units. The individual paper connectors, he explained, can be attached in various ways to form larger 3-D structures, including cubes or balls.

Wilson is passionate about merging creative thinking with engineering. He believes origami can engage students in a more meaningful way, helping them to better remember and think about what they learn.

Origami also ties in closely with Wilson's research, in which he studies how to make biologically-inspired paper structures designed to be a platform for tissue and organ growth. By using the techniques of origami, he believes that strategically folded paper can be transformed into fully-functioning bones and organs for the human body. His ultimate goal is to one day fold a fully-functioning human heart.

"A simple model we're working on now could be used for bone tissue synthesis," he said. "You roll a tube and grow bone on the outside and grow marrow tissue on the inside and you could literally have a femur."

Each summer, Wilson teaches an undergraduate class on Entrepreneurship and Innovation in Engineering, in which he splits students into teams, encouraging them to develop ideas for new products.

"I want to teach the students that inspiration and creativity can empower them to have a big impact on society," he said.

CONSIDERING REAL PEOPLE IN THEORETICAL DESIGNS

Patricia Andrasik, assistant professor of architecture

Patricia Andrasik finds teaching inspiration in the world around her. Recently, she was inspired by the story of a local and hotly debated development project on Monroe Street, only one block from the Brookland-CUA Metro Station.

Since 2012, the lot's real estate developer and nearby Brookland residents have clashed over how the land should be developed, halting progress. While

developers originally proposed a six-story apartment building for the site, neighboring residents fought back, claiming such a large building would negatively affect the unique character and scale of the neighborhood. The construction site, which was once the location of Colonel Brooks Tavern, is now a point of contention. It has been vacant for nearly five years.

Andrasik, recipient of the University's 2014 Advancement in Teaching Award, challenged students in her spring 2017 Sustainable Urban Housing Studio to propose theoretical designs for mixed-use sustainable housing for the site. As part of the assignment, Andrasik required students to speak to longtime Brookland residents, property developers, architects, and attorneys. Their challenge was to propose a building that would consider the site's purpose in the community as well as its development potential.

Drawing inspiration from Pope Francis's encyclical *Laudato Si': On Care for Our Common Home*, and the writings of Rev. William Byron, S.J., and Rev. Rodger Charles, S.J., Andrasik said she wanted students to consider the role Catholic social teaching can play in architectural decisions.

"In addition to environmental analytics, I always try to engage the students in housing issues that span the topic of Catholic social justice," Andrasik said, "not only because I love learning about that, but also because I try to design buildings from that perspective myself."

This is not the first time Andrasik's students have tackled complex or controversial architectural projects. Last year, she worked with students to design sustainable refugee housing for the city of Erbil in the Kurdistan region of Iraq. Students were required to study the local culture to understand the specific needs and desires of the refugee community.

"I want my students to understand the myriad challenges of their future professions as licensed architects. … That's my modus operandi in the studio — getting students as close to practice in the real human sense as possible."

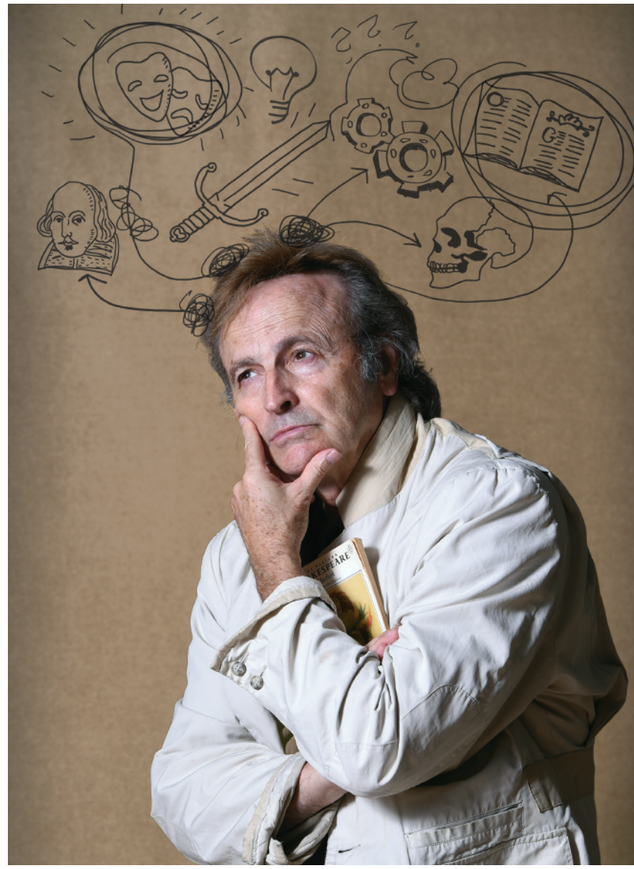
TAKING THE SHOW ON THE ROAD

Gary Sloan, professor and co-head of the M.F.A. Acting Program

By the time student actors brought the spring production of *Macbeth* to life in Hartke Theatre in April, they had already performed the Shakespearean tragedy many times around the Washington, D.C., area. As part of a performance studio class taught by Gary Sloan, the students gave intimate performances of the play in local high schools as well as the Sunrise retirement community and a transitional homeless shelter for men.

Sloan said he was inspired to launch what he calls the "CUActing tour" by his own experiences as a young actor touring with the Oregon Shakespeare Festival nearly 40 years ago.

"I always felt like I became an actor on that tour because I was doing a variety of scenes and monologues in so many different spaces," he said.



Bringing theatre alive in unexpected locations is a passion for Sloan. For the past several years, he has worked with the nonprofit Rehabilitation Through the Arts to direct theatrical productions in various New York State prison facilities.

As part of this spring's tour, Sloan arranged for his students to perform with minimal costumes and props. Unconventional "staging" allowed members of the audience to sit in a circle around the actors, leading to closer interaction and engagement with the play's action. Sloan believes those interactions challenged the young actors by forcing them to stay flexible and inhabit their characters in new ways.

"We're helping those who can already act by exposing them to a more heightened experience," he said. "We're increasing their confidence while serving the community as part of their training."

BRINGING HISTORY INTO THE PRESENT

Caroline Sherman, assistant professor of history

A flash mob of about 25 students emerged from a Gibbons Hall classroom, wearing black shirts and red, white, and blue cockades. Shouting "Vive le France," they marched to the Edward J. Pryzbyla University Center, where they read aloud from letters written by prisoners sentenced to die during the French Revolution. Some spectators who got caught up in the scene shouted at the condemned. "It was a little bit creepy," says Caroline Sherman. "You could see how mob violence can happen."

Sherman's area of expertise is early modern intellectual history, which covers the period from the Renaissance to the Enlightenment. Typically she starts a class by playing music from the period "to set the mood." She shares images, maps, and coins with her students.

"It's important," Sherman says, "that students have an opportunity to experience history."

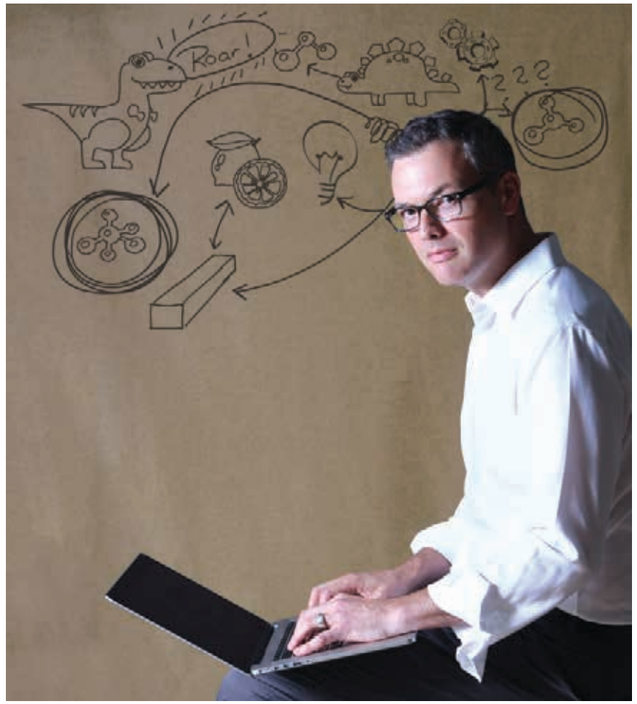
She planned the flash mob with help from Eleanor Holdridge, associate professor of drama. Sherman likes to collaborate.

In the fall 2016 semester, her French Revolution course joined forces with the course on the American Revolution taught by her history department colleague Amanda Moniz, who was then associate director of the National History Center (NHC). During the semester, students in each class researched religion, liberty, and politics in the respective revolutions they were studying. The two classes met together a few times to share their findings.

At the end of the semester, the two history teachers held a joint, public policy briefing modeled on NHC-sponsored congressional briefings in which historians provide context for contemporary policy debates.

In addition to faculty and students, local government officials and historians attended. Nine students gave presentations that drew on the research conducted by students in the two courses. Topics included the treatment of religious minorities, interpretations of church-state relations, and positive and negative definitions of liberty during the French and American revolutions. The event was highlighted on the NHC website and was featured in a panel presentation at the annual meeting of the American Historical Association.

"The students did so well in their presentations," says Sherman, the recipient of the provost's Teaching Excellence in Early Career Award last April. "It was a very optimistic event, which was particularly nice coming so soon after the divisive election. It was clear from the presentations that we can all find common ground in thinking about our deeper shared values and appreciation for the ways in which history continues to resonate in contemporary debates."



TEACHING CHEMISTRY AT THE KITCHEN COUNTER

Greg Miller, associate professor of biochemistry

To explain an emulsion, Greg Miller mixes melted butter and lemon juice. He demonstrates that the two ingredients can be mixed, but they won't stay combined for long because the butter molecules are more attracted to themselves than to the juice molecules. Miller isn't in his lab on campus. He's at home in his kitchen, where he videotaped the demonstration for his summer online course on the biochemistry of food and cooking.

The course is one of two online classes that Miller has created to pique student interest in the study of science. The other is Biochemistry of Science Fiction. In that course, students read Michael Crichton's *The Andromeda Strain*, about the deadly outbreak of an extraterrestrial microorganism. They watch the movie *Jurassic Park*, about a theme park filled with cloned dinosaurs. These spark conversations about the ways that scientists conduct research on the outbreak of disease and on cloning.

Miller, who received the provost's Advancement of Teaching Award last April, uses 3-D molecular modeling software to help his students see the way that molecules interact. He also supervises undergraduates who work as research assistants in his lab. They clone genes and purify proteins as part of his research projects, gaining valuable experience that prepares them for graduate studies or medical school. For his Science Communication course, he brings in speakers — including the communications director for National Geographic and an assistant director of the White House Office of Science and Technology Policy — because "it's become so important for scientists to talk to non-scientists." CU