

IMAGINE

A publication for friends of the
University Libraries at Virginia Tech



FALL 2019

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Dean's Message

Dear friends of the University Libraries at Virginia Tech,

As we gather with friends and family this season, I take time and reflect on the past year and what awaits us in the year ahead. I'm thankful for the opportunity to see so many transformations in the library profession. Libraries are integral to the knowledge discovery process, and we are strong research partners with faculty at Virginia Tech.

Throughout these pages, you will read about faculty and students who are reaching beyond traditional scholarship into the interactive realm of video, virtual reality, and other digital tools to analyze literature or illuminate history.

Virginia Tech researchers value our data services, including data management, curation, and analysis. Data is increasingly important in today's business, science, and social science professions. It informs decisions, confirms hypotheses, and can even predict future behaviors. Data scientists who can harness this powerful tool are in high demand. The University Libraries is helping Virginia Tech faculty with data challenges through our expertise and the training of undergraduate students interested in all things data.

Lastly, the University Libraries is committed

to sharing ideas, research, and scholarship. Open access or public access to research will change the traditional landscape of publishing research. We are seeing this across the globe and even here in Virginia.

Research is produced for the public good, but because of subscription paywalls, it is not always available to the general public who paid for it. You will read about some of our initiatives that enhance access to Virginia Tech scholarship and our leadership in this area of open data and scholarship. We have made progress but there is much more to do in the coming months and years ahead.

Thank you for your interest in and support of the University Libraries at Virginia Tech. It is an exciting time to be in academic research libraries. I look forward to keeping you connected and informed as we continue to integrate emerging technology, data services, and open access in our mission to support discovery of new knowledge at Virginia Tech.

A handwritten signature in black ink that reads "Tyler D. Walters".

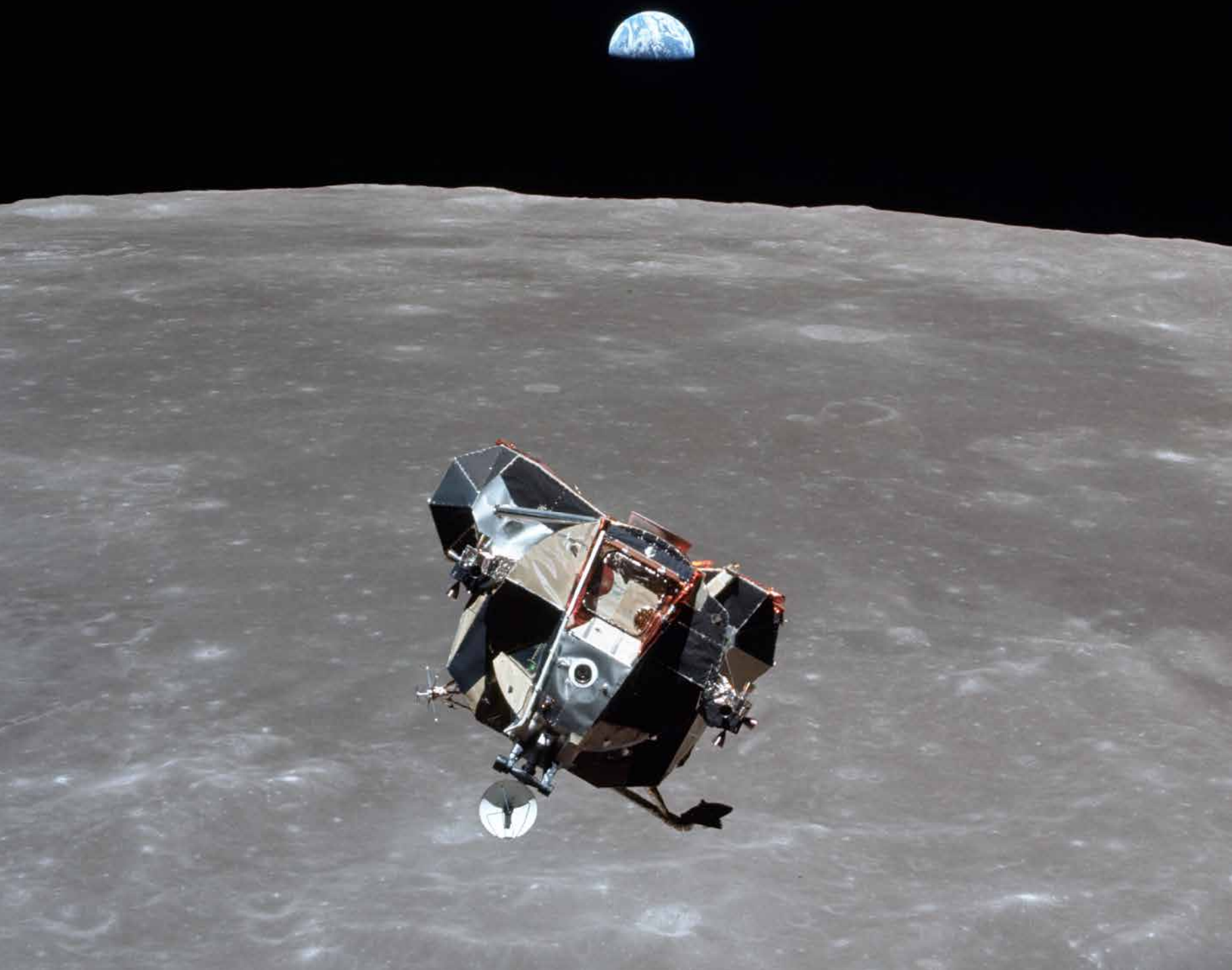
Tyler Walters, Ph.D.
Dean of the University Libraries
Virginia Tech



UNIVERSITY LIBRARIES
VIRGINIA TECH.

ONE GIANT LEAP

University
Libraries exhibit
celebrates 50th
anniversary of
Apollo 11



THE UNIVERSITY LIBRARIES at Virginia Tech's Special Collections and University Archives joined the nationwide 50th anniversary celebration of the first moon landing by hosting an exhibit, Celebrating the 50th Anniversary of Apollo 11. The exhibit was located inside Special Collections on the first floor of Newman Library.

Special Collections has one of the most extensive collections of documents, memorabilia, and personal papers from this and other historic NASA missions, thanks to Virginia Tech aeronautical engineering graduate Christopher Kraft '44. In the 1980s, Kraft, former director of NASA's Johnson Space Center and head of flight operations during Apollo 11, donated his papers to the University Libraries at Virginia Tech and encouraged his NASA colleagues to do the same.

From astronaut and command module pilot Michael Collins' own signed and annotated Apollo 11 flight plan to photos of Buzz Aldrin, Michael Collins, and Neil Armstrong during the mission, the items that were on display came from the collections of Kraft, Collins, and Evert Clark, a reporter who specialized in aviation, science, and space and covered the moon landing for Newsweek.

Curator of the Apollo 11 exhibit and archivist Marc Brodsky chose the displayed materials carefully. "What fits? What haven't folks seen? What might they want to remember? I wanted to include a balance of the more visual materials from the collections along with the more textual," said Brodsky.

The exhibit included a letter written by Charles Lindbergh to Michael Collins just after completion of the Apollo 11 mission. In 1927, Lindbergh was the first to complete a nonstop solo transatlantic flight, flying from New York to Paris in 33 hours. Collins spent more than 21 hours orbiting the moon alone while his fellow astronauts, Armstrong and Aldrin, were on the lunar surface. In the letter, Lindbergh speaks to the shared experience of the two flyers, each in his own realm and by himself, seeing a world as no one had before.

"What a fantastic experience it must have been — the first man alone looking down on another celestial body, like a god of space! There is a quality to aloneness that those who have not experienced it cannot know — to be alone and then to return to one's fellow man once more," Lindbergh wrote in his letter to

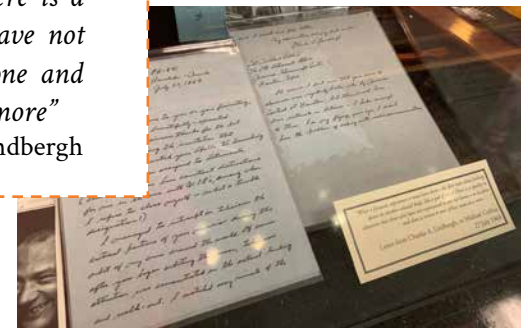
Collins. "You have experienced an aloneness unknown to man before. I believe you will find that it lets you think and sense with greater clarity. Sometime in the future, I would like to listen to your own conclusions in this respect," wrote Lindbergh.

Brodsky, a teenager in 1969, remembers watching the moon landing on television.

"We're now 50 years away from Apollo 11. The mission fulfilled the goal John Kennedy set in 1961, to land a man on the moon and return him safely to earth before the end of the decade," said Brodsky. "It was an Historic moment . . . with a capital H. I recall Walter Cronkite's expression when Neil Armstrong said, 'Houston, Tranquility Base here. The Eagle has landed.' He seemed to express relief, joy, and amazement, really, all at once. I think that's what most of us felt." ■

"What a fantastic experience it must have been — the first man alone looking down on another celestial body, like a god of space! There is a quality to aloneness that those who have not experienced it cannot know—to be alone and then to return to one's fellow man once more"

—Charles Lindbergh



^ Chris Kraft '44, NASA's first flight director

< Left: Lunar module performing a roll as it orbits the moon during an earth rise



Michael Collins in Command Module during Earth Orbit phase



SEE THE VIDEO
bit.ly/vtapollo





EXPANDING ▾

digital access and discovery of hidden knowledge

THE UNIVERSITY LIBRARIES was recently awarded two grants totalling almost \$600,000 from the U.S. Institute of Museum and Library Services' (IMLS) National Leadership Grants program. This program funds and supports projects that strengthen the quality of library and archive services across the nation by advancing theory and practice.

Only two Virginia awards were given this year from this program and both were awarded to the University Libraries at Virginia Tech. These grants total one of the largest awards in this cycle from IMLS.

"It is rare to be granted more than one grant in the same year and we are very honored," said Tyler Walters, dean of the University Libraries. "This shows that the work being done by our faculty is on the leading edge of this discipline."

During the past five years, the University Libraries has been one of the most funded academic libraries in the nation by IMLS and is making a significant contribution through national-level digital infrastructure initiatives.

Sens. Mark R. Warner and Tim Kaine stated in their recent press release that "Academic libraries are an invaluable resource with the potential to benefit universities and communities across the commonwealth," said the release. "We are thrilled that this grant will allow Virginia Tech and the Blacksburg community to activate a wealth of existing knowledge and continue to foster learning and innovation."

Of the two grants, \$505,214 will be awarded to the project Opening Books and the National Corpus of Graduate Research, led by Assistant Dean Bill Ingram, in collaboration with Edward A. Fox from the Virginia Tech Department of Computer Science and Jian Wu from Old Dominion University Department of Computer Science.

The project's goal is to deploy natural language processing and machine learning technologies to advance discovery, use, and

reuse of knowledge hidden in the text of books and other book-length documents. The research will focus on bringing computational access to book-length documents, such as the large national corpus of freely available electronic theses and dissertations (ETDs), free from the legal restrictions generally imposed by book publishers. The team will create methods for extracting and analyzing segments of long documents and put systems in place for summarizing chapters of longer texts and making it easier for users to find the information they need.

A wide range of audiences can benefit from this research including librarians, students, authors, educators, and researchers.

Virginia Tech has been a world leader in ETD initiatives for over 20 years. Theses and dissertations have been published at Virginia Tech since 1903, and it was the first university to require electronic submission of theses and dissertations in 1997. Today, many universities require students to submit a copy of their thesis to an institutional digital repository that then makes the dissertation freely available online.

"As a librarian and a computer scientist, I see the enormous, transformative potential of machine learning to computationally process library collections, leverage them to advance research and education, and increase their use," said Ingram. "This will allow libraries to provide a greater impact for our users."

For the second grant, \$87,151 will be awarded to Community Development Model for Digital Community Archives, led by Nathan Hall, director of digital imaging and preservation services. This project is in collaboration with Protect Our Water, Heritage, Rights Coalition (POWHR) and Ralph Lutts of Blue Ridge Heritage.

"What's novel here is that we are laying the groundwork to create a community-led digital archive," said Hall. "We are collaborating with cultural heritage organizations and with regional groups focused on coal and gas industries and their effects on the natural environment, human health, and labor."

This project expands digital access to regional collections and networks that are rich in cultural heritage but are isolated due to the absence of robust digital infrastructures. As a result of this project, communities will have greater digital access to geographically, socially, and politically-siloed collections and networks.

"This project is going to connect community organizations in rural Virginia and enable more people to become aware of their missions," said Hall. "We hope to demonstrate a different way of developing archival collections and a new kind of partnership between academic libraries and communities."

Without preservation, over time cultural heritage could be forgotten. This project aims to prevent that from happening. "We'll be bringing different narratives together to show how they are connected, and how these connections can be avenues for mutual support and benefit between these organizations, with the University Libraries as a supporting resource," said Hall.

Although this project is in the preliminary stages, Hall hopes that in the future this grant could be the starting point that leads to developing and advancing open access collections which could give others the ability to learn of their heritage or research a culture. ■

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Tyler Walters

Daunting Data Dilemmas

ANDREA DIETRICH, professor of civil and environmental engineering in the Charles E. Via Jr. Department of Civil & Environmental Engineering (CEE), faced a daunting challenge. Her AeroTrak particle counter malfunctioned and jeopardized her National Science Foundation-funded research. Her data wasn't recoverable from the instrument by normal means.

"Our research investigates aerosols produced from humidifiers. Our 1,080 records were collected in winter under conditions of low humidity in an empty room where we had worked on campus for the past three years," said Dietrich. "The room was reassigned to office space in 2019, and we would not be able to use it again. And the weather conditions would not happen again. Retrieving the data was essential.

"So as not to lose the data, cell phone images were taken of each record on the screen of the AeroTrak," said Dietrich. "A colleague suggested that an optical character reader (OCR) would be a better route to recover the data than retyping the data off individual images, both for time and accuracy. I reached out to the University Libraries because I thought they could help."

Dietrich was referred to Nathan Hall, director of digital imaging and preservation in the University Libraries. Hall quickly pulled together a team of library data experts to help.

Library faculty Chreston Miller, data and informatics consultant for engineering, and Jonathan Petters, data management consultant and curation services coordinator, joined Hall in investigating the best way to extract data from cell phone images.

Miller, a computer scientist who earned his bachelor's, master's, and Ph.D. from Virginia Tech, is the library's expert in image processing, OCR, and data mining.

"There were thousands of lines of data," said Miller. "We needed to pull out data points that met their specific criteria. Andrea and her graduate student Wenchuo Yao thought they would have to do it by hand. But I was able to convert the images to black and white, run the images through Adobe Pro's OCR engine, and then use the pdfminer Python library to extract the text."

Through this harrowing experience, Yao, a Water INTERface Interdisciplinary Graduate Education Program Ph.D. student in civil and environmental engineering, was able to experience how a multidisciplinary team goes to work to solve a daunting problem.

"The data retrieval was an interdisciplinary success accomplished by data scientists at the University Libraries and environmental engineers," said Yao. "Having all the data retrieved and accessible in an Excel file was both exciting and a relief because it saved me days of retyping. I was joyous to have my data, and so was my advisor."

"This was an interesting and challenging problem," said Miller. "I love my job because I use my background in computer science to help people solve problems and overcome challenges with data."

University Libraries' data services team has expertise in diverse data disciplines.

"When research faculty come to us with specific challenges, we are able to refer them to the data expert with the background to best assist them," said Miller. "We are here to help researchers with their data and support them in their success." ■

**"I LOVE MY JOB
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CHRESTON MILLER**

Andrea Dietrich, Chreston Miller, and Wenchuo Yao discuss the recovered data in the University Libraries' Data Consulting Lab.



A PLACE TO PLAY

Digital humanities hub Athenaeum offers space to invent new twists on literary analysis

TYECHIA THOMPSON, a Virginia Tech post-doctoral associate in the College of Liberal Arts and Human Sciences is using technology to transform a traditional publishing project into a choose-your-own-adventure exploration into history and literature.

Thompson's homebase, the Athenaeum, located on the first floor of the University Libraries' Newman Library, offered Thompson the resources to be creative and use digital tools in unique ways.

Thompson, along with collaborators from Virginia Tech Publishing, the Athenaeum, and other volunteers across campus, created an interactive literary analysis of works written by African American writers living in Paris. Her two projects, Baldwin's Paris and Love and Suspense in Paris Noir: Navigating the Seamy World of Jake Lamar's "Rendezvous Eighteenth," put a new digital spin on literary analysis.

Baldwin's Paris interactively takes visitors on a tour of Paris locations, such as monuments, residences, restaurants, and streets, referenced in African American author James Baldwin's lifetime of work. Each of the 100 placemarks includes citations for where the reference can be found in Baldwin's books, essays, or short stories published during his lifetime.

"This project is a spatial analysis of Baldwin's work. By using a geospatial and text mining approach, visitors experience a unique way to critically analyze this literature," said Thompson. "It's approachable and interesting. You can let your curiosity lead you through these important works and the culture of Paris during this time."

Love and Suspense in Paris Noir: Navigating the Seamy World of Jake Lamar's "Rendezvous Eighteenth" enables visitors to experience and analyze "Rendezvous Eighteenth" by Jake Lamar through video, audio, graphically engaging web pages, and interactive navigation. In the introduction, Thompson invites readers to linearly experience the analysis or switch up the order to follow where curiosity leads.

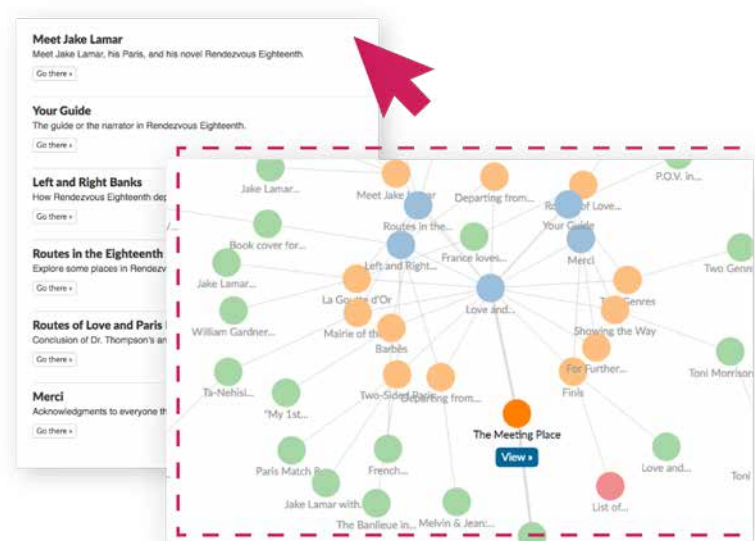
Thompson doesn't see herself as an author of these digital projects, but a producer. "In the digital humanities, all of the backend technology and programming becomes the front end," Thompson said. "I needed help to make my ideas for the project reality. I am almost like a producer that clarifies thoughts so that other people get the whole vision of the project."

She called on the help of Athenaeum student workers who brought their expertise to the project. Industrial engineering graduate student Supan Shah used text mining and Natural Language Processing (NLP) techniques to help Thompson determine whether the literary analysis supported her project's hypothesis. The two discussed various kinds of analysis that could aid Thompson in better exploring the text and implemented a few that they thought would best help her in her work.



“
The Athenaeum provides a space where it feels like you should play...

—Tyechia Thompson



Interactive elements of "Paris Noir" digital analysis



“As an industrial engineer, I am very comfortable working with numerical and structured problems,” Shah said. “However, working on this project has been an eye-opening experience with regard to the open-ended nature of questions that need to be answered and problem-solving approaches that need to be used to answer these questions.”

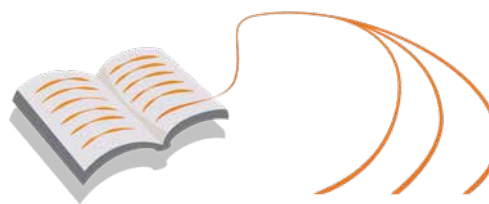
Soonyoung Kim, an assistant content designer for Virginia Tech Publishing and dual major in professional and technical writing and psychology, helped Thompson improve the design of *Love and Suspense in Paris Noir: Navigating the Seamy World of Jake Lamar’s “Rendezvous Eighteenth.”* While using her creativity and writing skill to transform the digital pages into engaging and interesting lessons, Kim learned about the black culture of Paris post-1960.

“The flourishing view of Paris is not everything that we perceive. There is much more than what the city has tried to present,” Kim said. “The story of author Jake Lamar encourages readers to be empathetic and argumentative at the same time against the hidden aspects of that society, such as racism and the harsh life of immigrants.”

Lamar visited Thompson’s analysis of his work and interactively traveled through the program. He said he was blown away by the 45-minute tour. “But, really, this is one of the greatest, most beautiful moments of respect, recognition and understanding that I have received in the 28 years since I published my first book,” said Lamar. “The interactive form is amazing. And I am so honored by the sensitive and sweeping examination you’ve given my novel.”

The Athenaeum was ideal to create a project like Thompson’s. “The Athenaeum provides a space where it feels like you should play in the space,” said Thompson. “We use the space creatively through its technology-rich classrooms, meeting spaces, and audio lab. We have digital resources to explore our topics widely through research and creation.”

The proximity of the Athenaeum to the University Libraries’ Special Collections, and the 3D printing, data visualization, media design, and virtual environments studios offer support to push the boundaries of digital humanities at Virginia Tech. ■



“

The interactive form is amazing. And I am so honored by the sensitive and sweeping examination you’ve given my novel.

—Jake Lamar,
author of *Rendezvous Eighteenth*



Supan Shah and Soonyoung Kim, student collaborators



TRY IT YOURSELF
bit.ly/vtbaldwin



ACCESS MATTERS

COMMITTED TO
SHARING
*IDEAS, RESEARCH,
SCHOLARSHIP*

A CHANGING LANDSCAPE

Tyler Walters, dean of the University Libraries at Virginia Tech, advocates for access to scholarly work. He has a history of leadership in the area of making knowledge publicly available.

He served as founding director of SHARE, a higher education initiative developing services to gather and freely share research and scholarly activities. He is a member of the Association of American Universities and Association of Public and Land-grant Universities public access working group. He also served as President of the Board of Directors, DuraSpace, a not-for-profit organization providing leadership and innovation for open technologies that promote durable, persistent access to digital data.

He joins deans and directors of research libraries across Virginia in reevaluating the current scholarly publishing model and advocating for greater access to research.

“In order to serve society, universities should strive to make research available to any global citizen with access to the Internet. Universities create and disseminate knowledge to fuel even more discovery,” said Walters. “There is no better way to do this than to make our research available to all who need it - freely and openly.”

According to Walters, much of the research conducted at public universities and published in expensive subscription-based scholarly journals is funded by tax dollars — faculty salaries and federally-funded grants. Research is produced for the public good, but it is not always available to the general public who paid for it. This is where open access or public access to research is changing the traditional landscape of publishing research.

“Throughout the country, universities are saying ‘no’ to big publisher contracts because of the exorbitant cost of these multi-million dollar contracts,” said Walters. “If public universities continue to say ‘no, we don’t agree with unilateral terms,’ we are laying the groundwork for a more effective and inclusive way to broadly share our important research.”

According to the Directory of Open Access Journals, more than 13,000 open journals are published today.

“With more people able to access research, the greater impact research has on advancing knowledge and improving lives,” said Walters.



Tyler Walters

Scholars looking for collaborators may not have access to subscription-based journals. This challenges the international reach of research. “Researchers look for collaborators for future research. Openly-published research is cited up to 18 percent¹ more than research behind publisher paywalls. If research is disseminated more publicly, researchers have more opportunity to collaborate to advance discovery.”

The number of public access policies is increasing and this model is well established. Private funders such as the Gates Foundation and Wellcome Trust and 17 U.S. federal agencies require research they fund to be made public.

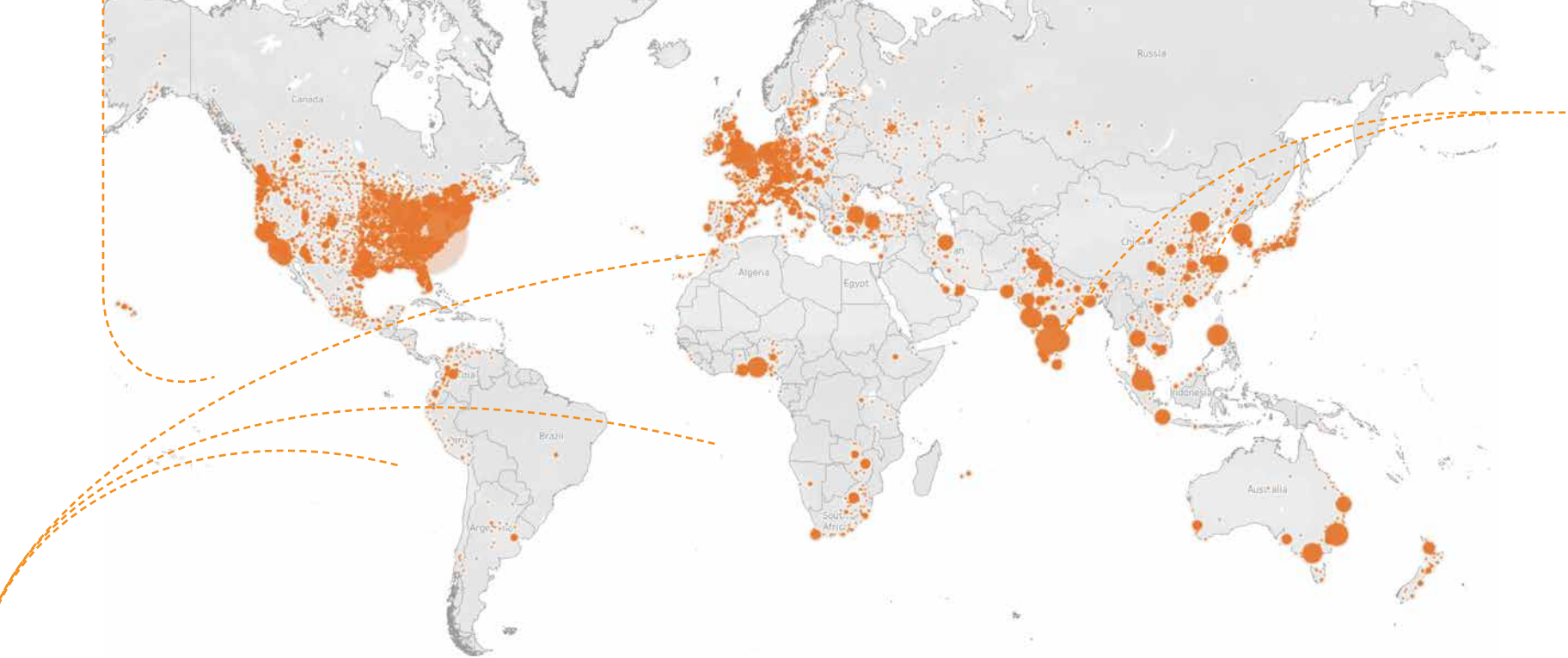
More than 50 U.S. universities have adopted open access policies by faculty vote, and the university’s research is made available through its institutional repository.

“The shift to making scholarly research and data available to the public is happening,” said Walters. “We need to make sure that our efforts help propel this movement forward and ensure that Virginia Tech research is broadly available to benefit society in a meaningful way.” ■

“In order to serve society, universities should strive to make research available to any global citizen with access to the Internet.”

—Tyler Walters

¹Piwowar H, Priem J, Larivière V, Alperin JP, Matthias L, Norlander B, Farley A, West J, Haustein S. 2018. The state of OA: a large-scale analysis of the prevalence and impact of Open Access articles. *PeerJ* 6:e4375 <https://doi.org/10.7717/peerj.4375>



Global IMPACT

This fall, VTechWorks, Virginia Tech's repository of faculty, staff, and student scholarship and related publications, turns nine years old. Faculty, students, researchers, and interested citizens from all over the world download more than 3,700 items a day from VTechWorks, housed by the University Libraries.

"We currently have more than 75,000 items in VTechWorks and our collection is growing about 7 percent per year," said Philip Young, University Libraries' institutional repository manager. "There are also 600-plus patents housed in the repository."

VTechWorks is an open repository, which means that anyone around the world with an internet connection can access and download journal articles, presentations, theses, dissertations, and other documents hosted by VTechWorks. Openly available research is cited 18 percent¹ more, on average, than research that is only available behind publisher paywalls. Open access facilitates the advancement of knowledge and makes a greater impact on society, including economic benefits.

"VTechWorks is well indexed by search engines, including Google Scholar, Microsoft Academic, and the browser extension Unpaywall. In addition to traditional scholarship, faculty, staff, and students can upload presentations and reports that might otherwise be unavailable, and those items will be added to other systems like Google Scholar and Elements," said Young.

"With institutional access to subscription journals, we sometimes forget about those without access, including researchers in the developing world, government policymakers, taxpayers, and our own alumni. Access benefits us too, since it's entirely possible to publish in a journal that Virginia Tech does not subscribe to."

VTechWorks is an example of an initiative that spans across multiple priorities within the university's Strategic Plan and embodies Virginia Tech's core values of diverse and inclusive communities, knowledge and innovation, opportunity and affordability, and excellence and integrity.

This fall, the Commission on Research's Open Access Policy Working Group will submit to the commission a draft policy that gives faculty the legal right to deposit their accepted manuscript of a scholarly article in VTechWorks, regardless of the journal's policy. It also states the faculty's commitment to take advantage of that new right by making their work openly available.

Currently, about 80 percent of publishers allow sharing a version of a journal article, though many have embargo periods ranging from six months to four years.

Faculty can deposit scholarship through Elements or directly in VTechWorks now and set the embargo period, if there is one. Once the embargo period expires, the research will automatically become available in VTechWorks.

"Many people hit paywalls and can't access the research they are interested in," said Young. "To a large extent, Virginia Tech research is funded by tax dollars from federal grants and by Virginia taxpayers in support of public universities.

"Making scholarship openly available is an important way that we can meet our global land-grant mission. With faculty help, we can do that through VTechWorks. It's a win-win for readers and scholars." ■

"With institutional access to subscription journals, **we sometimes forget about those without access**, including researchers in the developing world, government policymakers, taxpayers, and our own alumni."

—Philip Young

¹Piwowar H, Priem J, Larivière V, Alperin JP, Matthias L, Norlander B, Farley A, West J, Haustein S. 2018. The state of OA: a large-scale analysis of the prevalence and impact of Open Access articles. *PeerJ* 6:e4375 <https://doi.org/10.7717/peerj.4375>

Enhanced teaching and learning

What do a book-loving therapy dog, top four social media tips, and research proposal support all have in common? Faculty and students can find these topics and more in the University Libraries' online learning tool repository Odyssey.

Lisa Becksford, University Libraries' online and graduate engagement librarian, presented about this unique digital library at the Distance Library Services conference in San Antonio, Texas, and later collaborated with Stefanie Metko, University Libraries' director of teaching and learning engagement, on an article published in the Journal of Library & Information Services in Distance Learning.

"Odyssey is an online collection of unique resources to help professors and librarians teach students how to become confident researchers," said Becksford, "from accessing, using, and citing library resources, to managing research data and sharing their research with their communities."

Faculty can access these teaching and learning tools created by University Libraries' faculty on their own through the Odyssey website. Also, the learning objects housed in Odyssey are openly-licensed, which means that anyone is welcome to use the objects as they are or modify them as needed for their context.

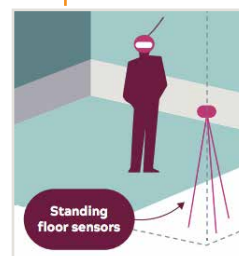
"For instance, a librarian who needs to teach students about how to find a book in Newman Library may use the Moose the therapy dog video from Odyssey in a research guide created for a particular class or program, and a professor may create a Canvas module featuring a handout and video from Odyssey to teach students about poster design," said Becksford. "Students will encounter the content in both of those situations without necessarily knowing that there's a thing called Odyssey, but the fact that the items were in Odyssey in the first place enabled the items to be found easily and shared with students via other platforms."

"There were a couple of challenges that Odyssey was designed to overcome. One of those was the need to scale our library instruction — the campus is growing, both in in-person programs in Blacksburg and our extended locations and in online classes and programs," added Becksford. "Online instructional materials enable us to reach more students. Whether they're in Blacksburg taking an in-person class or studying in our other locations like Roanoke or the greater Washington, D.C., metro area, they have access to research support and instruction through Odyssey."

The learning tools are openly available to the community as well.

"Odyssey also serves educators outside of Virginia Tech and addresses challenges that they may face if they do not have someone creating instructional tools. It provides a place for librarians and educators outside of Virginia Tech to find openly-licensed materials to teach library skills — not just videos, but interactive tutorials and handouts as well," said Becksford. "I see Odyssey as a way to help Virginia Tech fulfill its global land-grant mission because it's available to educators all over the world."

Becksford said learning tools are continuously added to the digital library in response to faculty and student needs. "We're hoping to add quizzes, lesson plans, and Canvas modules in the future." ■



INTRODUCTION TO DATA ETHICS



Odyssey
learning tools
for virtual
reality and
data ethics

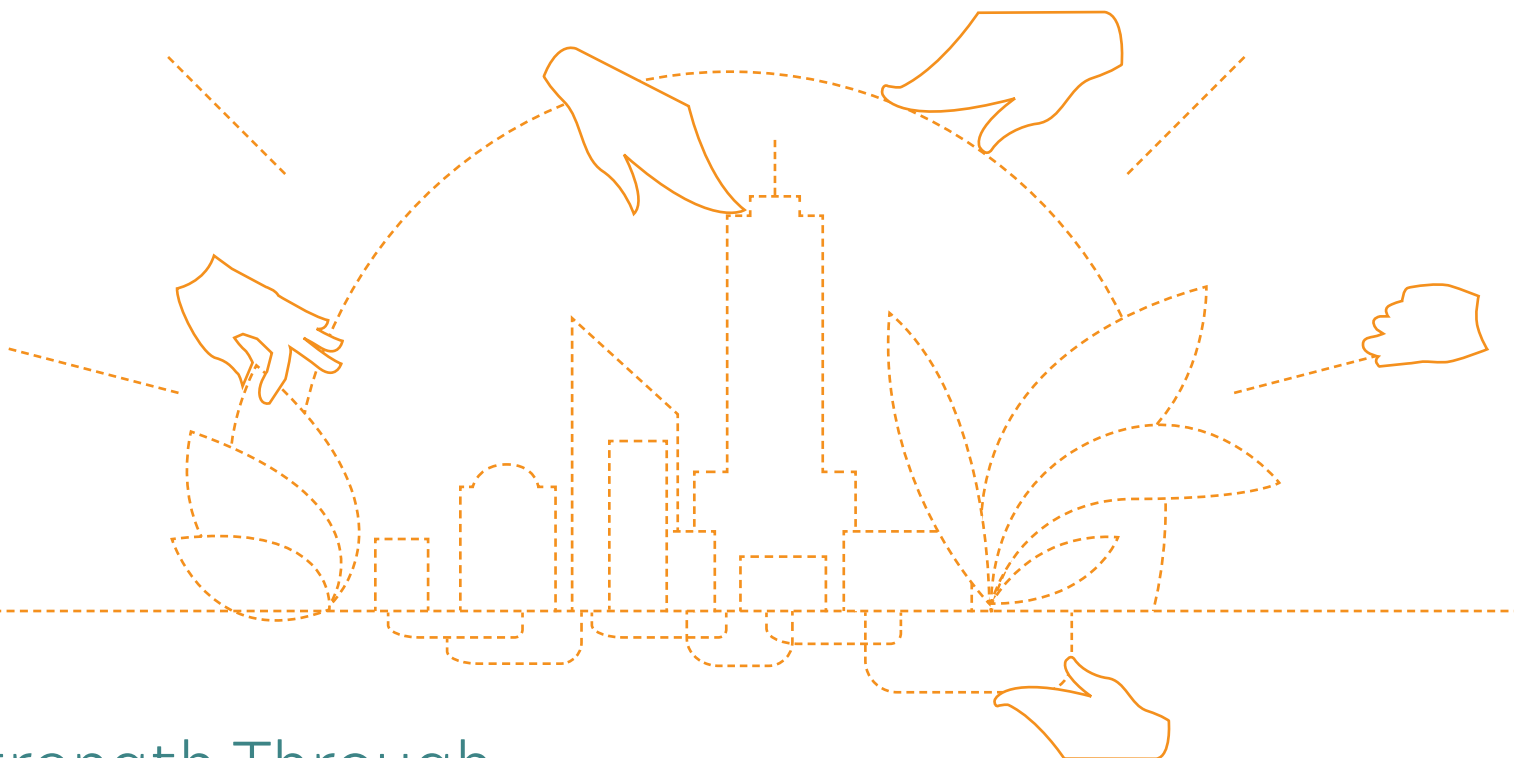


Lisa Becksford



SEE THE VIDEO
bit.ly/odysseydog





Strength Through Collaboration:

A merger to better create, share, and preserve knowledge

University Libraries Dean Tyler Walters believes in building the information infrastructure and services needed for research in the 21st century. Throughout his professional career, he has served on working groups, organization boards, and committees dedicated to promoting and creating open technologies, and making research, data, and scholarly activities available to the public.

His latest endeavor, leading the merger of international nonprofits DuraSpace and LYRASIS, continues his professional influence in the areas of open data, open source software, and open scholarship to benefit future advances in the sciences and humanities.

While serving as board president of DuraSpace, an organization supporting open source software communities, Walters and others saw an opportunity to connect with LYRASIS, a leading membership organization of more than 1,000 libraries, museums, and archives that supports shared access to academic, scientific, and cultural heritage.

“Libraries across the nation and beyond create nonprofits,” said Walters. “Collaboration in consortia saves libraries money in technology infrastructures and applications that we need to do our work. This is an important collaboration to the functioning of a library.”

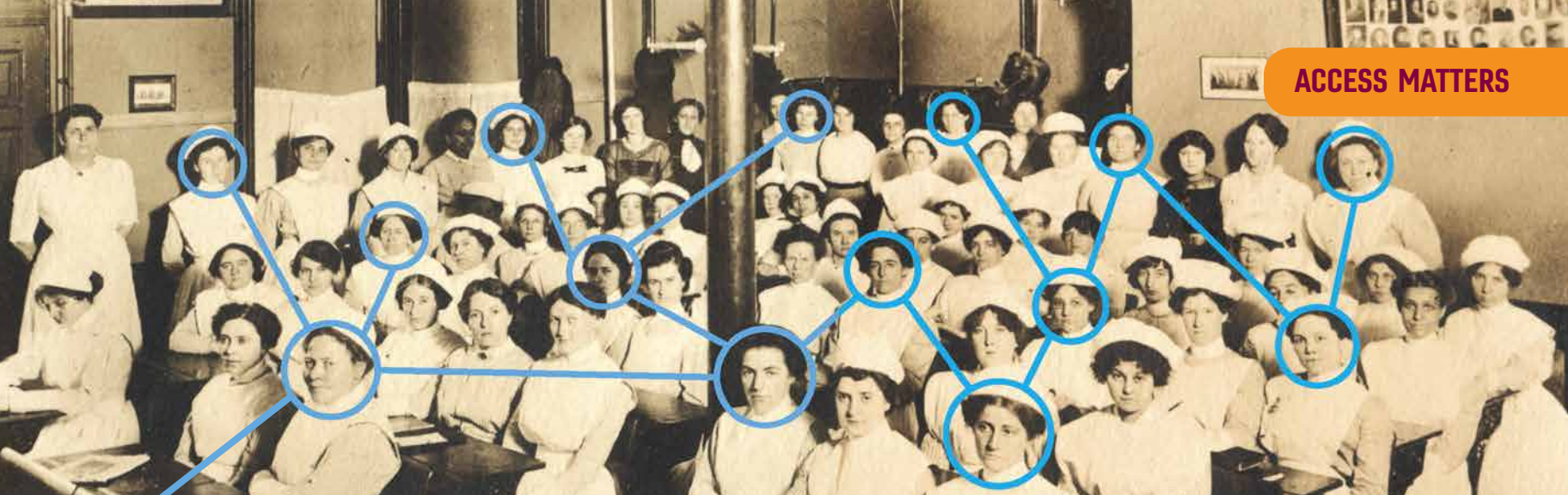
“These two organizations had similar goals with overlapping membership,” said Walters. “It made sense that this merger could make their common mission stronger and enhance services, technology, and expertise to better support libraries and other types of cultural and educational institutions.”

This merger created a new model for collaboration, innovation, and development in the landscape of academic, research, and public libraries, as well as galleries, archives, and museums. It strengthens each organization’s expertise and offers opportunities for expansion.

“Academic libraries rely on DuraSpace’s open source software projects DSpace, Fedora, and VIVO and LYRASIS ArchivesSpace and CollectionSpace,” said Walters. “Merging all of these technologies together under LYRASIS better serves us all into the future.”

Walters will continue to provide leadership to the new LYRASIS by serving a three-year term on its Board of Trustees. ■

“COLLABORATION IN CONSORTIA SAVES LIBRARIES
MONEY IN TECHNOLOGY INFRASTRUCTURES
AND APPLICATIONS THAT WE NEED TO
DO OUR WORK.” —TYLER WALTERS



Connections:

Unique partnership combines digital humanities with medical history

Virginia Tech Publishing, Virginia Tech's scholarly publishing hub housed in the University Libraries, recently launched "Viral Networks: Connecting Digital Humanities and Medical History," under the Virginia Tech Publishing imprint.

Edited by E. Thomas Ewing, a professor of history, and Katherine Randall, a doctoral candidate in rhetoric and writing, the book is the culmination of the Viral Networks workshop.

The workshop was hosted by the History of Medicine Division of the National Library of Medicine in the National Institutes of Health through a formal partnership with the National Endowment for the Humanities. It was also organized by Virginia Tech and funded by the Office of Digital Humanities of the National Endowment for the Humanities. This partnership between two government agencies and a university makes this volume a distinctive academic achievement.

Virginia Tech Publishing and the University Libraries were partners from the beginning of this project, as they were part of the initial proposal to the National Endowment for the Humanities and the National Library of Medicine. Peter Potter, publishing director of the University Libraries, and Nathaniel Porter, a data scientist at the Library, attended the workshop, and thus were part of the first round of reviews of papers that became the chapters.

Robert Browder, a digital publishing specialist, and colleagues in the University Libraries worked with the co-editors on the structure of the book, editing of chapters, data visualizations, cover design, and dissemination, which has ensured that each stage of this process

has been an active collaboration between the University Libraries and the co-editors and chapter authors, explained Ewing.

Inspired by models of networked teaching methods, the Viral Networks workshop brought together scholars whose research focuses on medical history topics, from the Black Death in 14th-century Provence to psychiatric hospitals in 20th-century Alabama. During this workshop, these scholars discussed how they use networks as a tool for historical analysis. They also read, edited, and evaluated each other's writings and chapter contributions to "Viral Networks."

"This book represents a wonderful partnership supporting research and exciting new ways of exploring and writing the history of medicine in our digital age," said Jeffrey S. Reznick, chief of the History of Medicine Division of the National Library of Medicine.

"Viral Networks" shows the critical role that networks have frequently played in human societies while simultaneously demonstrating the power of network analysis for analyzing them. Readers will learn how to identify an appropriate network to analyze, find the best way to apply network analysis, and choose the right tools for data visualization. The result is a fully networked project rather than just a collection of individual chapters.

"The book is not the typical collection of essays in which each chapter essentially summarizes an author's research," Potter said. "In 'Viral Networks,' the chapters are personal essays in which the authors describe their attempts to incorporate network thinking into their own research. This makes the book

a great source of practical advice for other historians who may be contemplating using network thinking in their own research. There's nothing else out there like it."

This volume brings together many priorities in both the College of Liberal Arts and Human Sciences and Virginia Tech, such as supporting innovative research, transdisciplinary integration across disciplines, open-access publication, graduate student and faculty scholarship, and experiments with new forms of scholarly dissemination to broad audiences.

"It was rewarding to be involved in a process that connected so many priorities and created new opportunities for collaboration," Ewing said.

"Viral Networks," an open-access book published in multiple formats, can be downloaded for free on the Virginia Tech Publishing website and through the National Library of Medicine's Digital Collections. Print editions can be purchased through online retailers, such as Amazon. ■

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STORIES NOT SYMPTOMS: AN EXHIBITION OF GRAPHIC MEDICINE

GRAPHIC MEDICINE IS A NEW AND UNIQUE GENRE OF LITERATURE, WHICH COMBINES THE BRIGHT AND WHIMSICAL NATURE OF COMIC BOOKS WITH THE MEDICAL JARGON OF DISEASE AND INDIVIDUAL EXPERIENCE. IT OFTEN INCLUDES PATIENTS' OWN STORIES AND HEALTH PROFESSIONALS' PERSPECTIVES TO RELEASE EMOTIONAL BURDENS AND PROVIDE SUPPORT.

STORIES NOT SYMPTOMS

EACH PATIENT has a unique experience as they navigate the challenges of illness.

To tell those personal stories of illness and health, graphic medicine uses comic books and graphic novels. It is a way to explain illness to patients and also help patients heal through the creation of art.

The University Libraries' exhibit *Stories Not Symptoms: An Exhibition of Graphic Medicine* highlighted the combination of the bright and whimsical nature of comic books with the medical jargon of disease and illness to tell the health stories of individuals. Through the abstract art, comics add approachability and emotion to the stories and clinical data. The exhibit features work by multiple graphic medicine artists and an interactive opportunity for visitors to create their own graphic medicine.

In April 2019, graphic medicine artist and author Whit Taylor visited Newman Library and spoke about her position as an artist and public health practitioner in this conversation about graphic medicine.

"National Public Health Week, during the first week in April, was an ideal time to raise awareness of using graphic medicine to tell medical narratives. Public libraries are becoming hubs for health literacy, and here at the University Libraries, we launched some of our health literacy programming with our

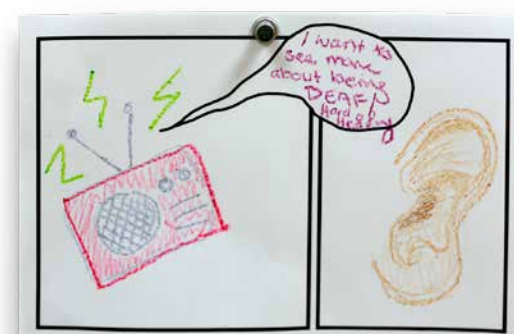
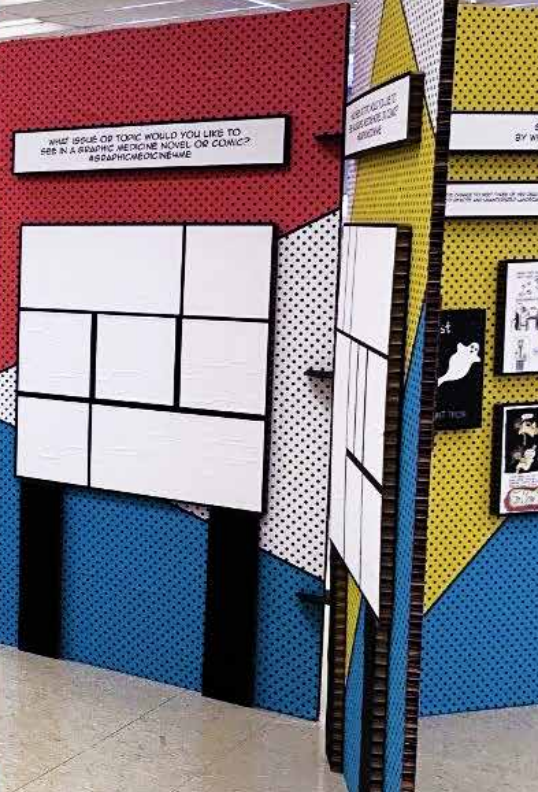
graphic medicine exhibit and guest speaker event," said Erin M. Smith, head of research engagement at the University Libraries.

Taylor is a New Jersey-born cartoonist, author, and editor who studied cultural anthropology at Brown University and received her master's in public health in social and behavioral sciences from Boston University School of Public Health. Her comics have been published in *The Nib*, *The New Yorker*, and *Illustrated PEN*. She has become an active speaker about the intersection of public health and comics, and she recently gave the keynote address at the 2018 Comics & Medicine Conference. Her presentation is sponsored by the Moss Arts Center's Women and Minority Artists and Scholars Lecture Series.

"The University Libraries is the natural choice for folks to explore how people are using comics and graphic novels to navigate serious health issues, and we were happy to have writer Whit Taylor join us in celebrating the opening of our *Stories Not Symptoms* exhibit," said Smith. ■



SEE THE VIDEO
bit.ly/vtmedstories



"I want to see more about being deaf / hard of hearing." Visitors were encouraged to share their own stories or requests in comic form.

CREATIVITY UNLEASHED

IN COLLABORATION with the Institute for Creativity, Arts, and Technology (ICAT), University Libraries recently hosted the eighth annual Maker Camp.

Maker Camp is a four-day summer camp for middle school students, ages 11-14, designed to harness students' creativity, introduce methods of design in both physical and digital realms, and grow their maker mindset. Campers receive hands-on experience with building, coding, creativity, and critique and are encouraged to act on their curiosity.

In previous years, the campers designed musical instruments. This year, the camp's co-directors, Sara Sweeney Bear, Scott Fralin, and Max Ofsa of the University Libraries and Phyllis Newbill of ICAT, switched to inventing arcade games.

The physical structures of the games incorporated such materials as 3D printed parts, which the campers designed in TinkerCAD; lights or sounds controlled by a Raspberry Pi micro computer; a multitude of sensors like photo-resistors and pressure plates; Scratch coding language; and cardboard, tape, hot glue, rope, string, tennis balls, old frisbees, and costume jewelry. They followed an iterative design process for prototype creation called D.I.C.E or Designate, Ideate, Create, and Evaluate.

Camp began with several warm up activities, like creating something to wear or carry to help them be successful during Maker

Camp. Students created tool belts, backpacks, a pretend robotic arm, and even a thinking cap.

After warm up activities, campers started to form groups with creative names, such as The Iron Toads and Squirrel Power. "Once they have some ownership of their team, they developed a brand for themselves. You can see it in what they end up building," said Ofsa, University Libraries' 3D Design Studio manager.

The rest of camp was dedicated to creating arcade games. "We had everything from a tilting maze that used magnets to trip you up as you guided a ball into a goal, to a ball-launching game with targets on a motorized belt," said Sweeney Bear, Fusion Studio manager and learning space assessment coordinator.

"Maker Camp gives kids skills and autonomy. They get the time, space, and permission to make something amazing," said Newbill, ICAT outreach and engagement coordinator. "What the kids enjoyed the most was having the freedom to make whatever they can imagine!"

When campers were asked what their favorite part of camp was, their faces lit up with smiles as they said BUILDING! Other popular answers were coding, designing, and working with all of the library's technology.

"My favorite part of camp was using all of the tech[nology] at the library," said camper Alice Bartos, age 11. "I liked designing the 3D printed coin we used as the prize!"



"I think it makes them look at their world a little differently," explained Sweeney Bear. "We try to give them resources and skills that they can keep using after camp. Most of the supplies we use are things they could find around the house. The software is all available for free online, and they can 3D print designs for free here in the library. In theory, the only thing they would have to buy to keep practicing these skills at home are the Raspberry Pi computer and sensors, and they're not absolutely necessary for making a fun game."

On the last day of camp, campers were excited to take to the stage in the Moss Arts Center and describe and share the designs they created together.

"My favorite part was seeing it all come together at the end and building something awesome with my friends," said Carson Williams, camper, age 11, who did the programming for his team. "I used Scratch, a Raspberry Pi, and a breadboard to wire the sensors. I built the code in Scratch so it gives you a point when the sensor is triggered."



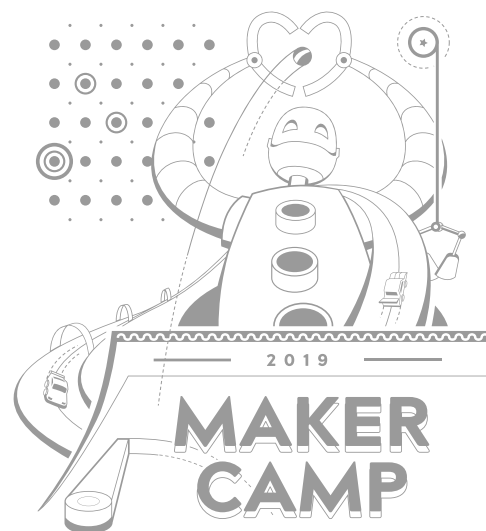
"Kids who feed their creativity and channel their energy in productive ways grow into adults who do the same," said Sweeney Bear. "We need more adults like that. I think middle school leading into high school is when we traditionally stop seeing play as a part of learning, and that's a shame. We can play to learn our whole lives. I want these kids to leave with a spirit of play and creativity that they can carry with them for years to come."

"I think Maker Camp is one of the few camps to appeal to such a young age group, especially with the technology and concepts they are tackling," said Ofsa. "High school ends up being pre-college any more, and getting these campers interested in very real disciplines like science, technology, engineering, and design can help them figure out what they might have a knack for."



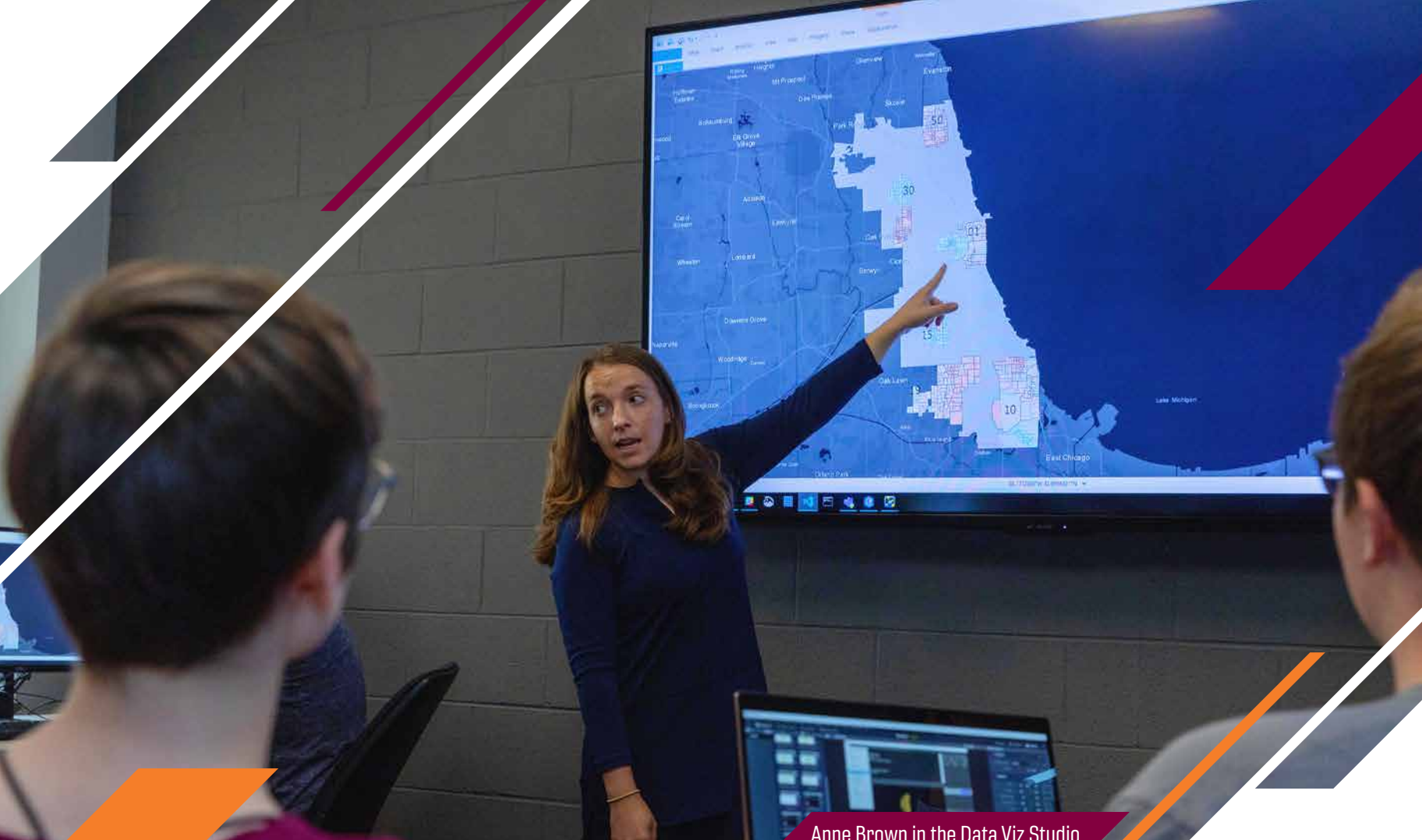
Maker Camp was made possible by a team of creative professionals from the University Libraries, ICAT, Pamplin College of Business, College of Engineering, and College of Liberal Arts and Human Sciences' School of Visual Arts.

Maker Camp 2020 is already in the works, and the planning process has begun. Next year's camp will also be in Newman Library, where the campers have access to the University Libraries' tools in the 3D Design, Media Design, Fusion, and Virtual Environments studios as well as the space to collaborate and create. ■



SEE THE VIDEO
bit.ly/vtmaker19





Anne Brown in the Data Viz Studio

DataBridge

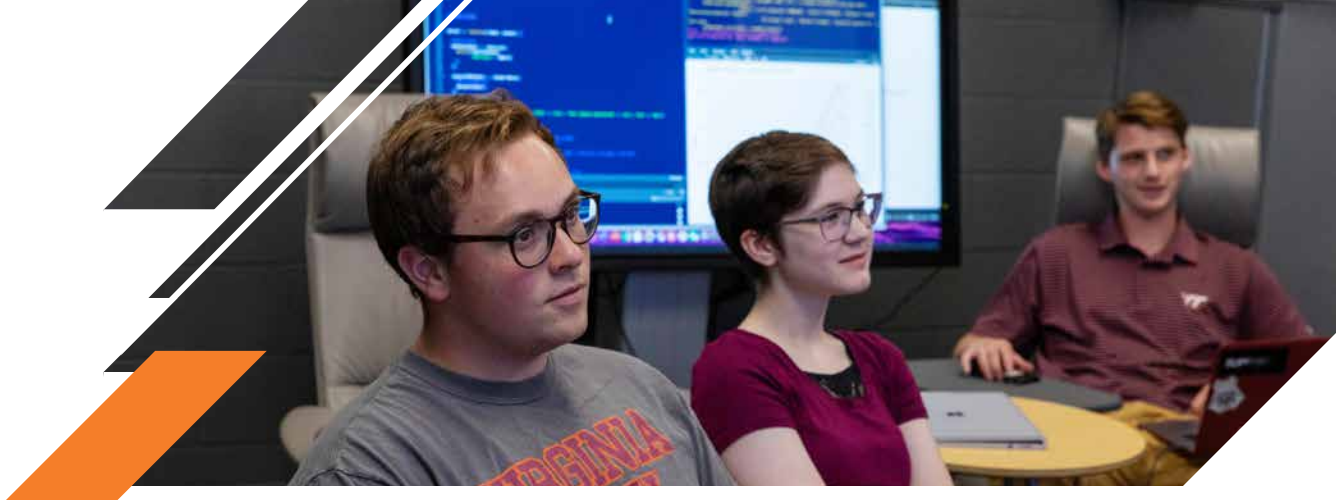
students prepared for success in
high-demand data professions

DATA IS INCREASINGLY important in today's business, science, and social science professions. It informs decisions, confirms hypotheses, and can even predict future behaviors. Data scientists who can harness this powerful tool are in high demand.

According to Glassdoor's Best Jobs in America 2019, data scientist is at the top.

The University Libraries at Virginia Tech is providing hands-on training for undergraduate students to be successful in this booming profession. DataBridge is an undergraduate research experience, led by the University Libraries' Anne M. Brown and managed by Jonathan Briganti, that gives students interested in working with data a chance to increase knowledge and hone skills by helping graduate students and faculty with data challenges.

DataBridge students are first trained in data-logic skills and then are paired with a Virginia Tech client and project. Clients can be faculty members or graduate students with specific data-related or ill-defined problems, such as an unexplained data leak or inconsistent data collection over many years, or university offices or centers that need support with specific projects. Students work autonomously then gather weekly in the University Libraries' Data Visualization Studio to discuss progress and challenges; often students from different disciplines collaborate to create solutions.



DataBridge students act as consultants, project managers, problem-solvers, analysts, programmers, cleaners, collectors, and visualizers of data.

“We have first-year to fourth-year students from many disciplines on our DataBridge team. Students come from biochemistry, computational modeling and data analytics, business information technology, and computer science,” said Brown. “If you’re a theater major and interested in learning how to work with data, we’ll teach you how to solve data-related problems.”

“We demystify data and programming. It’s not scary. We make it approachable,” said Briganti. “We have an open environment to talk about different kinds of concepts, and we focus on building partnerships across campus to solve data challenges. This works because the library isn’t connected to any one discipline. Students really like working in DataBridge because researchers from a variety of disciplines walk through the door, and students can work on a project that suits or expands their academic interests.”

DataBridge thrives because the University Libraries is open to all students. Research data are generated and used in every department in every college and institute: in the library, every student can find their niche.

Andrew Miller, third-year undergraduate student majoring in systems biology and computer science, loves analyzing trends in data. “I am very interested in using data and math models to explore and model the world,” said Miller. “DataBridge is perfect for me. One of my favorite aspects of the job is the spontaneity. Every client has very different requests and tastes,” said Miller. “One of the first consults I did involved hand-combing through 20,000 lines of code. I worked to build a tool to assist in fixing errors in the code.”

LaDale Winling, associate professor of history, is researching the history of political elections in Chicago. He heard about DataBridge through Corrine Guimont, University Libraries’ digital publishing specialist.

“I was eyeing a grant opportunity and needed a partner to help design a database for the elections data,” said Winling. “I was seeking a set of collaborators who were data-savvy, technically expert, and curious about working with humanists.”

Brown, Briganti, and DataBridge students were just the partners he needed. They are creating data schemas, producing visualizations, and doing geospatial analysis for Winling’s research.

“Collaborations with groups like DataBridge bring together students with a wide variety of experiences and perspectives. This always enriches the research process,” said Winling. “In the specific case of students, combining the creation of new knowledge inherent in research with the pedagogical process of advising and educating students on a project is mutually reinforcing and gives a great two-for-one dynamic to our interactions. I’m very appreciative of the time I get to work with students.”

DataBridge is a mini-laboratory because of the research output, critical thinking, rigor, professionalism, writing skills, and reflection involved in each project. Regardless of discipline, students are immersed in the research process and provide data expertise in a real-life environment through hands-on experience.

“We have more work coming through the door every day. We encourage students to join our team and make a difference in Virginia Tech’s research enterprise,” said Briganti. “If students want to work, we have it.”

Miller looks forward to applying his honed data skills to his own business and helping to meet the demand for data analysts.

“After graduation, I hope to find a job in data science, but eventually I hope to run my own data analysis and solution company,” said Miller. “DataBridge has given me real-world practice working with clients and problem solving a variety of consults. This will give me a head start in the ever-competitive working world.” ■

“Collaborations with groups like DataBridge bring together students with a wide variety of experiences and perspectives. This always enriches the research process.”

—LaDale Winling

A passion for PRESERVATION

ELIZABETH BERG '19 is using drones, photogrammetry, and her love of preservation to recreate former Corps of Cadets residences Monteith and Thomas halls. The two buildings were demolished in the summer of 2017 as a part of a redesign of the Upper Quad.

"I have friends who lived in those buildings. I think people should remember them," Berg said. "A lot of my friends are in the corps, and it's a really important part of their college experience and the school's history. My grandfather, Phillip Keister, was also a member of the corps for a year while at Virginia Tech. I want to make sure this program and these halls are highlighted."

Berg reached out to Todd Ogle, executive director of applied research in immersive environments and simulations at the University Libraries, to discuss an independent study with him to create an app that features a virtual 3D visualization of the building. Berg brought the challenge and Ogle provided direction and taught her programming and technology behind virtual environments.

Through this experience with Ogle, she used drones and photogrammetry to build a visualization that pieces together the halls' history.

"She is getting to do many things outside of her curricular wheelhouse," Ogle said. "Collaboration is key to helping students find their passion."

The University Libraries offers drone lending through a partnership with the Virginia Tech Drone Park. This partnership and access to emerging technology made this high-level artistic and technology-centered project possible.

"We needed to create an accurate picture of the space as it is now. We used technology called photogrammetry to piece together 280 images taken by Gregory Calbert, safety officer and manager of the drone park. The data is like puzzle pieces, and you have to find the best fit for the best picture," Berg said. "I am also planning to incorporate historical photos of the residence halls. So the app users will be able to get a full picture of what the area once was and the meaning behind those buildings."

Berg's passion for the preservation of buildings and structures was inspired by fellow Hokie and Disney employee Chris Pajonk '10. They met while Berg was participating in the Disney College Program in Orlando.

"A classmate of mine from the Highty-Tighties reached out to introduce me to Elizabeth while she was in Orlando," Pajonk said. "He mentioned she was interested in curation, preservation, and digital archiving. She definitely came prepared and knew what she was talking about. You could see this was definitely a passion for her."

Since 2015, Pajonk has worked for the Show Documentation Library in Disney's Ride and Show Engineering Department. He helps maintain records to refurbish or recreate the buildings, vehicles, show sets, audio-animatronics, and graphic elements of Walt Disney World.

With a bachelor's degree in history and a concentration on the history of science, technology, and engineering, Pajonk said his mix of interests in liberal arts and technology fit his career choice.



"I took the foundations in technology, materials, and manufacturing processes that I enjoyed and combined them with the research methods and critical thinking of history and liberal arts to pivot toward a career in museums and libraries — with a soft spot for preservation," Pajonk said. "Patience and a lot of networking afforded me the chance to do that for Disney."

Berg and Pajonk share the same passion for preservation. "Preservation, whether physical or digital, preserves the fingerprint that the subject left on our world long after its expiration date," Pajonk said. "Having these touchstones of the past to refer to, learn from, and improve upon is imperative to our continued success in a number of fields."

"While not always possible or practical to preserve the object physically, the data collected digitally through scans, detail photos, material samples, or even interviews and blueprints are vital to allowing scientists, researchers, and other enthusiasts of the future to reap the benefits of the object's existence and the imprint it left on the world," Pajonk said.

"I met someone who has my dream job!" Berg said. "When I walked into Chris's office and saw all of the fabric swatches, building plans, paint samples, and photos, I knew that I wanted to be a part of preserving history in this way."

Berg's work is also special to Pajonk. "I lived in Monteith Hall from 2006 to 2009. Elizabeth's project serves the university community by providing alumni the chance to virtually walk through their old residence halls and by recording the architectural, cultural, and historic details of the building as it was during its service," Pajonk said. "As an educational component, projects like Elizabeth's pull double duty in contributing to the historical record of the university while teaching students skills that continue to be in demand in fields such as manufacturing, architecture, museums, and beyond."

Berg graduated in May 2019 and is currently a museum assistant with the Corps of Cadets at Virginia Tech. She continues working on her project and researching the history of the residence halls. She hopes to continue her studies in a graduate program for historical preservation or library science. ■



280 PHOTOS

WERE CAPTURED AND
PIECED TOGETHER TO
CREATE A 3D RENDERING
OF WHERE THOMAS AND
MONTEITH ONCE STOOD.

Faculty Achievements and Spotlight



Anne Brown

receives the 2019
Scholarship of Teaching
and Learning Award

Anne M. Brown, assistant professor in research and informatics in University Libraries and an adjunct professor in the Department of Biochemistry in the College of Agriculture and Life Sciences, received the 2019 Scholarship of Teaching and Learning Award.

The award is presented annually by Virginia Tech's Center for Excellence in Teaching and Learning (CETL) to recognize faculty members who have dedicated themselves to the pursuit of scholarship addressing teaching and learning in higher education. All Virginia Tech instructional and research faculty members (full-time and part-time) and graduate students are eligible for nomination for the award.

Brown joined Virginia Tech in the summer of 2016 as a data and informatics consultant in University Libraries. She currently holds positions as an adjunct faculty in the Department of Biochemistry and assistant professor, science informatics consultant, and health analytics coordinator for research and informatics in University Libraries.

Brown's expertise in using high-performance computing for molecular dynamics simulations and virtual screening focuses on molecular mechanisms, protein structure-function relationships, and drug design. She is also involved in the training and mentorship of undergraduate research students in these areas and collaborates with faculty and students on the integration of computational thinking and discipline-specific computational tools into their research or classroom. In addition, Brown consults on and helps researchers with data analysis, data publishing, and data visualization.

Continually looking for ways to engage students in authentic, experiential work, Brown strives to enhance their skills in regards to workforce development, highlight and celebrate their achievements, and connect research experiences to the basic best practices in pedagogy. Going forward, Brown seeks to include broader implementation of these frameworks, determination of best delivery and assessment methods for these types of experiences, and work on university-wide programs to celebrate undergraduate research.

Brown was recognized at the CETL's Recognition of Teaching Excellence Reception on April 24 at Jamerson Athletic Center. Each awardee received a plaque commemorating the award and a \$500 prize.

The scholarship of teaching and learning involves the rigorous examination and investigation of higher education teaching and learning. It uses a research-based, scientific and scholarly lens to examine questions in higher education pedagogy, making the results public for examination and critique. ■



Paul Hover

honored with
emeritus status

Paul Hover, associate professor and former assistant director for international outreach initiatives for the University Libraries at Virginia Tech, has been conferred the title of associate professor emeritus by the Virginia Tech Board of Visitors.

The emeritus title may be conferred on retired professors, associate professors, and administrative officers who are specially recommended to the board by Virginia Tech President Tim Sands in recognition of exemplary service to the university. Nominated individuals who are approved by the board receive a copy of the resolution and a certificate of appreciation.

A member of the Virginia Tech faculty since 2005, Hover made significant contributions to the University Libraries through his work in the areas of cataloging and in international outreach. He also supported the University Libraries' scholarly serials cataloging modernization and automation processes.

Hover established the University Libraries' international outreach program, including a librarian exchange collaboration between Virginia Tech and Cape Peninsula University of Technology in South Africa. In addition, he partnered with faculty from across Virginia Tech on a TEAM Malawi project that helped Mzuzu University rebuild its library collection after a devastating fire.

Hover represented Virginia Tech on the American Library Association's International Relations Round Table and as a delegate to the International Federation of Library Associations and Institution's Standing Committee on Series and Other Continuing Resources for eight years.

Hover received his bachelor's degree from Princeton University, an undergraduate degree from the University of Amsterdam, a master's degree from the University of Auckland, and an M.L.I.S. degree from the University of Illinois at Urbana Champaign. ■

Celebrating diverse scholarship



Virginia Tech authors in attendance celebrate together

THE VT AUTHORS RECOGNITION EVENT, hosted by the University Libraries, celebrated and recognized the creation of knowledge and the diversity of scholarship across the university. From topics such as the history of smell to computational fluid dynamics, the books represented Virginia Tech's land-grant mission.

Executive Vice President and Provost Cyril Clarke joined in the celebration of authorship by faculty, staff, and administrators and congratulated the authors on exemplifying this mission.

"A land-grant institution is committed to this tripod-type mission," said Clarke. "We're absolutely committed to educating the citizenry, not just of the state, but across the globe. We're committed to conducting research, research that is basic, that is translational, that's applied to clinical, research that has potential for making a difference. And we are committed to outreach and service."

"What you see here is what we do. It's what we do at Virginia Tech," said Clarke.

This annual event also celebrates those who publish in publicly accessible journals through the University Libraries' Open Access Subvention Fund, which enables authors to engage in new transformational open publishing environments and encourages new ways of thinking about digital scholarship and information access.

VT Authors Recognition Event 2020 is scheduled for March 25, 5-7 p.m., fourth floor, Newman Library. ■



Provost Cyril Clark speaks at VT Authors 2019



SEE THE VIDEO
bit.ly/vta19video



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