2021-2022

Annual Report

UNIVERSITY LIBRARIES
VIRGINIA TECH

Message from the Dean

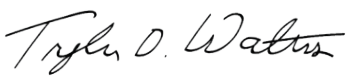
The University Libraries at Virginia Tech's 2021-22 annual report illustrates the integral role the University Libraries plays in the university's ability to carry out its mission successfully.

The University Libraries is known for enhancing teaching, learning, and research through its application of data, information, and knowledge. It works as a partner in creating, curating, and communicating knowledge to new learners at Virginia Tech as well as researchers around the world through its robust repositories like Virginia Tech's scholarship repository VTechWorks and Virginia Tech Research Data Repository. We also offer programs to create new learning materials such as open educational resources, which are typically books or textbooks.

We support the human needs and narratives of the university community by opening new meditation rooms, familiarizing students from historically underrepresented groups with the Library through gaming, and partnering to preserve stories of Appalachian African Americans.

A few critical components to research and scholarship are learning creation and production skills, performing analyses, and communicating their significance. In these areas, the University Libraries is engaged in new forms of digital and data literacy instruction in partnership with the colleges. It also performs complex data analysis to support university research and foster new business partnerships to carry that research forward. Through these activities, the University Libraries contributes to Virginia Tech's continued institutional excellence.

As you will see in this report, the University Libraries is continuing its work toward its strategic plan goals with the academic enterprise's core strategic themes and cross-cutting goals in mind. This annual report's stories and data points provide examples of the University Libraries' work throughout the year.



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

2021·2022 BY THE NUMBERS

USAGE

3,414,642 Journal (full text article request)

1,791,828 Ebooks (book and chapter downloads)

166,470 Multimedia (multimedia requests)

83,725 Virginia Tech Data Repository downloads

12,029 Technology lending

1.06M Gate counts at library locations

GRANTS

12 Grants awarded

$687,575 Dollar value

FUNDRAISING

450 Private donors

$714,173 New gifts and commitments

579 Gifts made

INSTRUCTION

1,593 Annual instruction and presentation events

15,457 Annual instruction and presentation event participants

1,014 Instruction events that support university curricula

7,791 Event participants

579 Instruction events that support general development

9,586 Event participants

OUTPUT

194 Library employee output items

62 Conference paper / presentations

30 Non-Conference presentation

29 Internet publication

20 Journal article

12 Book chapter

10 Refereed journal article

10 Exhibition

6 Report

3 Poster

2 Dataset

2 Book

8 Other including software, code, and media product

GOAL

ADVANCE REGIONAL, NATIONAL, AND GLOBAL IMPACT

University Libraries, through its activities involving creativity and innovation, data, and scholarship will actively contribute to the university's learning, discovery, and engagement missions and advance its regional, national, and global impact.

The University Libraries **elevates the productivity and impact of faculty scholarship** through openly sharing research data and scholarly articles and promoting faculty authored books and expertise. This work **enhances the university's global reach and reputation**.

Virginia Tech's scholarship and data repositories increase global impact of faculty research

VTechWorks

VTechWorks provides global access to Virginia Tech scholarship and includes journal articles, books, theses, dissertations, conference papers, slide presentations, technical reports, working papers, administrative documents, videos, images, and more by faculty, students, and staff. For the first 15 months of the university-wide open access policy (March 22, 2021 to June 30, 2022) Virginia Tech faculty submitted 196 accepted versions of scholarship.

196 accepted works

3k items downloaded each day

Countries accessing VTechWorks most frequently are the U.S., India, Philippines, United Kingdom, China, Canada, and Germany in that order. Open textbooks tend to dominate the usage.

THE TOP 3 most accessed items in VTechWorks during FY22 include two open textbooks and a research article:

85,284 total views

Kennedy, Reed. (2020) **Strategic Management**. Blacksburg, VA: Virginia Tech Publishing. https://doi.org/10.21061/strategicmanagement CC BY NC-SA 3.0.

49,410 total views

Skripak, Stephen J. and Ron Poff (2020). **Fundamentals of Business, 3rd Edition**, Blacksburg, VA: VT Publishing. http://hdl.handle.net/10919/99283. Licensed with CC BY-NC-SA 4.0 https://creativecommons.org/licenses/by-nc-sa/4.0.

18,604 total views

Hodges, Charles B.; Moore, Stephanie; Lockee, Barbara B.; Trust, Torrey; Bond, Mark Aaron; (2020): **The difference between emergency remote learning and online learning**. http://hdl.handle.net/10919/104648.

Virginia Tech Data

The Virginia Tech Data Repository highlights, preserves, and provides access to data sets of the Virginia Tech community to help disseminate the intellectual output of the university. During the FY22, data sets in the repository were viewed more than 50,000 times with more than 85,000 downloads. The top five data set groups accessed include College of Engineering, Civil and Environmental Engineering, College of Science, Natural Resources, and Agriculture and Life Sciences.

50k views

85k downloads

92 countries

Countries accessing the Virginia Tech Data Repository most frequently include the U.S., United Kingdom, Netherlands, Ireland, China, Germany, and Russia. In all, visitors from more than 92 countries accessed data sets in the repository.

THE TOP 3 most accessed datasets in FY22 include:

2,323 total views

Bianchi, Eric; Hebdon, Matthew (2021): **Concrete Crack Conglomerate Dataset**. University Libraries, Virginia Tech. Dataset. https://doi.org/10.7294/16625056.

1,739 total views

Marek, Paul (2021): **The first true millipede: 1,306 legs long**. University Libraries, Virginia Tech. Dataset. https://doi.org/10.7294/16850347.

1,355 total views

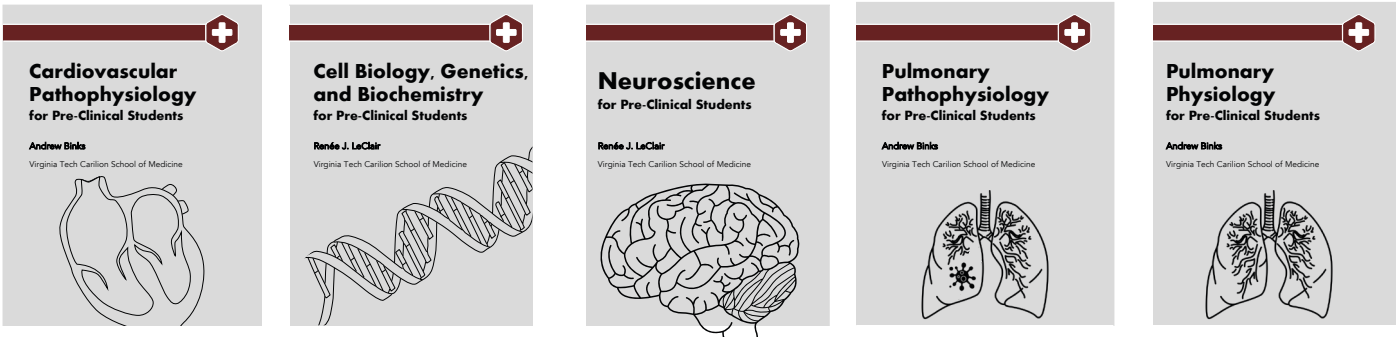
Siddik, Md Abu Bakar; Shehabi, Arman; Marston, Landon (2021): **The environmental footprint of data centers in the United States**. University Libraries, Virginia Tech. Dataset. https://doi.org/10.7294/14504913.

Authors Andrew Binks and Renée LeClair collaborate with Anita Walz on the five-book series. Photo by Trevor Finney for Virginia Tech.

Virginia Tech faculty author freely available medical textbooks

Renée LeClair, Virginia Tech Carilion School of Medicine associate professor, remembered her frustration when she designed an integrated course for first-year medical students and couldn't find a single textbook or resource to support the classroom experience she envisioned. Thanks to a VIVA Open Course Grant, University Libraries Open Education Initiative, LibreTexts, and Virginia Tech Publishing, she and her colleague Andrew Binks teamed up to author their own.

Virginia Tech Carilion School of Medicine and Virginia Tech Publishing, through Virginia Tech's Open Education Initiative housed in the University Libraries, published a five-volume textbook series for pre-clinical medical students that is adaptable and freely downloadable through Pressbooks and LibreTexts. This series aligns with the United States Medical Licensing Examination and is based on faculty experience and peer review.



The five medical textbooks are available for download at publishing.vt.edu. Cover designs by Kindred Grey.

Binks said now is a perfect time for the series.

"Medical education had traditionally included independent basic science courses, each covering a different discipline, such as biochemistry or physiology, and each discipline had its own thick and expensive textbook," said Binks. "There is now a transition to integrate the disciplines in the classroom to reflect how they are integrated and interdependent in the human body and in medicine. The opportunity to write our own books gave us the flexibility to support an increasingly integrated medical curriculum with short, movable chapters that could be quickly rearranged to suit the course restructuring."

The textbooks are adaptable to a professor's teaching style because they are openly published under a CC BY-NC-SA 4.0 Creative Commons license. This permits anyone with access to the internet download to remix, adapt, and build upon the text in a non-commercial way. They can do this as long as they credit the authors and license their new creation under identical copyright terms.

"While some textbooks are akin to encyclopedias, containing every possible concept at expert levels, this series is purposeful," said Anita Walz, University Libraries' assistant director for open education and scholarly communication. "It is highly focused and relevant to selected courses taken during the first few years of medical school. Students using the texts are not expected to become biochemists or cell biologists, but are being trained as physicians. A larger percentage of these focused texts are used by students instead of a smaller percentage of the many expensive books previously required for these courses."

Since the publication of the first book in late 2021, this series has had a global reach. According to online viewing statistics, visitors from more than 90 countries across the globe viewed the texts and thousands of those viewers downloaded them.

Virginia Tech's Open Education Initiative

Disciplines supported

in creating eight open textbooks and open educational resources in FY22 include

- Business
- Health sciences
- Aerospace engineering
- Theater
- Agriculture

Types of scholarship

- Textbooks
- Manuals
- Guidebooks
- Test banks
- Problem sets

Projects were funded by the University Libraries' Open Educational Resources Grant and VIVA Open Adopt and Course Grants.

The team piloted technologies MathML and LaTex to **improve accessibility of textbooks** with mathematical equations.

Upcoming FY23

collaborations include books on:

- Fish
- Fishing
- Conservation
- Holistic green real estate management

Cozette Comer. Photo by Chase Parker.

Open book project examines differences and similarities between Finland and U.S. reactions, strategies, and behaviors during COVID-19

Cozette Comer, University Libraries evidence synthesis services coordinator, is collaborating on a pandemic-centered book, "Perceptions of a Pandemic: a comparative study between the U.S. and Finland," with local and international colleagues. Comer and Virginia Tech sociology faculty member Donna Sedgwick; James Hawdon from Virginia Tech's Center for Peace Studies and Violence Prevention; Pekka Rasenen, economic sociology faculty member from the University of Turku, Finland; Eetu Marttila, a Ph.D. student in economic sociology from the University of Turku, Finland; and Aki Koivula, an economic sociology faculty member from the University of Turku, Finland hope to openly publish the book to make it freely available online by summer 2023.

Comer says this book describes their cross-national study between two similar, yet different countries. "While Finland tends to be more trusting of its governing bodies and the U.S. less so, they are both liberal democracies with well-developed economies and healthcare systems," said Comer. This would be the first existing longitudinal cross-national comparative study about attitudes and behaviors in the early stages of the pandemic. "Exploring this timeframe in particular is important for informing the way we handle future pandemics," said Comer.

Topics include perception of the causes of the pandemic and their impact on behaviors, protective behaviors related to media consumption, compliance with risk mitigation policies, which institutions are best suited to address the pandemic, and how money should be allocated. Comer said this book is intended to inform policy and assist decision makers in reducing the spread of future pandemic illnesses.

Ensuring scholarly access to government archives and records

In 2020, University Libraries and the Virginia Tech Center for Digital Humanities received an Andrew W. Mellon Foundation planning grant to work with the National Archives to understand the opportunity for using artificial intelligence to help make digital records more accessible to the public.

The outcomes from this grant funded project included a five-day online planning workshop in 2021 to explore the application of artificial intelligence methods to increase access and use of archival material housed by the National Archive and Records Administration in the National Archives. The workshop was well attended by a large and diverse group of archivists, librarians, humanists, technologists, information scientists, and computer scientists. It focused on the humanistic and equitable issues of artificial intelligence and developing ethical, human-centered technology that promotes the public good. The workshop focuses on artificial intelligence bias mitigation.

Bill Ingram, University Libraries assistant dean and director of information technology, and Sylvester Johnson, director of the Virginia Tech Center for Digital Humanities, published an open access copy of the report "Ensuring Scholarly Access to Government Archives and Records" summarizing the workshop and its outcomes. Ingram and Johnson submitted a version of the report as a chapter in an upcoming book on libraries, archives, and digital humanities. They are currently working on revisions.

"Building on the success of the workshop and the strong collaborative relationship I developed with Sylvester Johnson at the Center for Humanities, I established connections with other federal agencies, in addition to the National Archives and Records Administration," said Ingram. "This year, we teamed up with the National Archives Office of Innovation, Library of Congress Labs, and the Smithsonian OCIO Data Science Lab to organize and lead a second series of workshops on the topic of artificial intelligence for public archives with a focus on ethics and the mitigation of bias."

These most recent workshops, held in spring 2022, were aimed at senior leadership from libraries, archives, and public cultural heritage organizations. Ingram invited library deans and information technology heads from U.S. universities with large online digital collections. The goal was to help these leaders understand the challenges, opportunities, and risks of artificial intelligence, and give them the language to talk about ethics of artificial intelligence and how to assess the readiness of collections for its use.

Also in the spring, Ingram held two online workshops to explore new approaches in machine learning and artificial intelligence for digital collections, the importance of ethical frameworks, and the opportunities for institutional collaboration. This fall, a workshop is scheduled to focus on artificial intelligence ethics.

GOAL

ELEVATE THE UT PROSIM (THAT I MAY SERVE) DIFFERENCE

The University Libraries commits to build and maintain enduring climates of mutual care, respect, and responsibility. We affirm the intrinsic humanity of every person and claim an active role in removing all barriers to inclusive and equitable participation in our work.

The University Libraries **engages in partnerships** to provide service to students, faculty, and local communities and **encourages an environment in which all individuals can thrive**.

Serving underrepresented students through accessibility research and projects

College life includes class, group projects, and discipline specific clubs and organizations. It also includes play, social exploration, and community connections. The University Libraries intersects all of these activities in a variety of ways and strives to be inclusive and welcoming to all students.

Neurodivergent students sometimes experience challenges in both the academic and non-academic sides of college life. The University Libraries partnered with the Disability Caucus to investigate board game and roleplaying game support items that could be a part of the lending collection through the library's Studios Technology Lending Desk. For students, social game-playing helps relieve stress and increases mental wellness.

According to Alice Rogers, manager of studios media and lending services, the tabletop gaming industry has grown over the past 10 years. The popular game Dungeons & Dragons has made appearances in television shows such as Stranger Things and The Late Show with Stephen Colbert.

"While there are a lot of physical support items for Dungeons & Dragons, one thing we identified as a need was improved cognitive access to games — making rules and unwritten play standards easier to approach for neurodivergent players, and helping to foster community among neurodivergent and disabled players of DnD," said Rogers.

The group is still in the development stage for these items, but have used materials and support from the library's prototyping studio. They also plan to use computers and software available in the library's media production suite to develop visual content. Kayla McNabb, assistant director of teaching and learning engagement, and Rogers will engage their expertise to conduct play tests, usability testing, accessibility, and the use and maintenance of materials in a lent environment.

"These games are collaborative storytelling, so they're inherently social, but in a structured, low-stakes way that can really benefit people as they connect and spend time with others," said Rogers. "By working to make Dungeons & Dragons and other tabletop role-playing games more accessible to neurodivergent and disabled players, we hope that folks are able to find community with one another, and also expand the number of storytellers and stories that come out of games like these to include and center more disabled voices."

Kayla McNabb leads a group of library employees through a session of Dungeons & Dragons. Photo by Alice Rogers.

Zainab Hashmi. Photos by Chase Parker.

Architecture student builds meditation space in Art & Architecture Library

Zainab Hashmi, spring 2022 architecture graduate, spent five years at Virginia Tech and in that half-decade grew as a student, an architect, and a human being. While her experience in Blacksburg was an overwhelmingly positive one, there was still one struggle that she faced every day on campus – finding a location to pray.

Praying five times a day is obligatory for every adult Muslim physically and mentally capable of doing so. Finding a quiet place to fulfill that obligation proved to be challenging for Hashmi – as well as many other Muslim students on campus.

"It was very difficult to find places to pray. I had to pray in the janitor's closet before. I've had to pray in the corner of classrooms sometimes," Hashmi said.

For her final project, she designed a meditation space for the Art & Architecture Library in Cowgill Hall. Although the idea was derived from her own personal struggles to fulfill her Muslim obligations, she designed a space for people from all religious beliefs and backgrounds.

"I call it a meditation space because I want it to be a space where anyone could meditate. Obviously, I have my own experience as to why I need a meditation space, but when I

was designing it, I was thinking it could be for Christians, Jews, Muslims, atheists, agnostics, or whomever you are. It's a place where you can come and sit down in peace and quiet," Hashmi said.

First, she had to find a way to fund the project. Scott Fralin, University Libraries exhibits program manager and learning environments librarian, was quick to help.

"I was approached last fall by a couple of people in the School of Architecture + Design about placing a meditation space in the library, and I thought it was a great idea. The library is a space for everyone, and it's generally a quiet space. So we just thought it would be a good spot to carve out a space for anyone that may need meditation," Fralin said.

Fralin has witnessed the struggles that Hashmi faced first-hand. He's seen corners of public rooms occupied by students in need of a place to pray. When the concept of the meditation space came to his attention, he knew he had to do what he could to make it happen.

"One thing I've always tried to do in all of my work is remove barriers to entry in any way possible. I think having a space like this shows people that they're welcome here, so it helps to remove a barrier that many students on campus face," Fralin said.

With the funds in place, it was time to bring her concept to life.

On the morning of May 11, 2022, the usually quiet Art & Architecture Library was filled with the bangs of hammers colliding with nails and the high-pitched buzz of electric drills as the meditation space was being built.

The space that Hashmi spent five years wishing for was finally a reality.

She graduated just three days after the project was finished. Even though she will not personally reap the benefits of having an easily accessible meditation space, she's glad that she could provide the much-needed amenity for those to come.

Christiansburg Institute, University Libraries collaborate to preserve Appalachian African American storytelling, history

The Christiansburg Institute now has the power to tell its rich, century-long story through its self-managed Christiansburg Institute Digital Archive thanks to a $251,052 Digitizing Hidden Collections: Amplifying Unheard Voices grant from the Council on Library Information Resources. University Libraries at Virginia Tech is collaborating with the institute on its grant-funded project, "Changing the Narrative: Modeling Equitable Stewardship of African American Storytelling and History," to digitize stories, photos, and documents of Christiansburg Industrial Institute — the first high school in Southwest Virginia to educate the formerly enslaved (1866-1966).

The grant funds will support digitization of 38.65 linear feet of Christiansburg Institute Museum and Archives' collections, including technology and two new institute staff positions to digitize and process materials on site at the Christiansburg Institute.

University Libraries has access to specific experience, funding, technologies, and bandwidth to create additional avenues of discovery for the collections. The materials will be freely available to anyone with an internet connection through the Christiansburg Institute Digital Archive and the University Libraries' Southwest Virginia Digital Archive.

"Christiansburg Institute's rich 100-year history of African American education and empowerment represents a succinct cultural tradition of learning and innovations expressed in rural Appalachian communities throughout the 19th and 20th centuries," said Chris Sanchez, executive director of the Christiansburg Institute Inc. "This story is important because it is emblematic of the racial repression and injustices experienced by generations of African Americans, who nonetheless built institutions and communities that thrived and who called Americans of all races to a higher moral standard."

The unheard stories gleaned from 870 photographs, 60 slides, 15 diplomas, 48,000 typed pages, and 3,300 handwritten pages from the school's principals, teachers, and students are invaluable in spotlighting the Black Appalachian experience throughout the ages.

3,300
handwritten pages

870
photographs

60
slides

15
diplomas

48,000
typed pages

To see the collection visit: hub.catalogit.app/8896

Christiansburg Industrial Institute, "C.I.I. Student Record Photographs 102," Christiansburg Institute Digital Archives, accessed September 23, 2022, https://christiansburginstitute.omeka.net/items/show/192.

Christiansburg Industrial Institute, "C.I.I. Student Record Photographs 4," Christiansburg Institute Digital Archives, accessed September 23, 2022, https:/christiansburginstitute.omeka.net/items/show/94.

This work finally will make available precious family connections between institute alumni and their descendants.

"This history has been largely inaccessible for the past 50 years," said Christiansburg Institute (C.I.) Archivist Jenny Nehrt. "Digitizing Christiansburg Institute's archives is also important because many of the African Americans who either attended C.I. or had family members attend C.I. do not live in the New River Valley anymore. For a variety of economic and social reasons, there is a network of C.I. alumni and descendants across the country. And as many of us know, getting to Southwest Virginia can sometimes be a challenge. I hope the Christiansburg Institute Digital Archive will reunite families with their material history, regardless of their distance."

This project exemplifies a newer model of collaboration between a large academic institution and a grassroots community organization.

"We mindfully built a grant proposal that prioritized the autonomy of C.I. to tell its story and preserve its material history while also furthering the work of the University Libraries' Southwest Virginia Digital Archive," said Nehrt.

University Libraries' Digital Preservation Coordinator Alex Kinnaman said this project fits into Virginia Tech's land-grant mission. "We have an obligation to support our community in any way we can, including supporting local community collections through our funding and expertise without removing autonomy and ownership from the original owners," said Kinnaman. "Cultural heritage organizations like Christiansburg Institute maintain incredibly valuable and historically significant resources that need to be accessible and discoverable to a wider audience, and the University Libraries has the expertise and resources to support that goal."

Kinnaman said she hopes this collaboration is the first of many community partnerships."I hope that this project encourages partnerships with other cultural heritage organizations in a way that is mindful of past experiences, meets their needs and expectations, and enriches the University Libraries' collections to be more diverse and representative of the region in which we live and work."

GOAL

DESTINATION FOR TALENT

University Libraries is a place to collaborate, innovate, create, and share. We aspire to transform the way people experience knowledge and through our efforts, help to attract bold and dynamic faculty, staff, and students to a diverse and inclusive community to be a force for positive change.

The University Libraries **highly values and encourages transdisciplinary discovery and evidence based, student-centered learning** through its many resources and spaces. The library studios bring together students and faculty from all disciplines to experience knowledge, discovery and learning through emerging technologies and library employees' unique expertise.

Photos by Chase Parker.

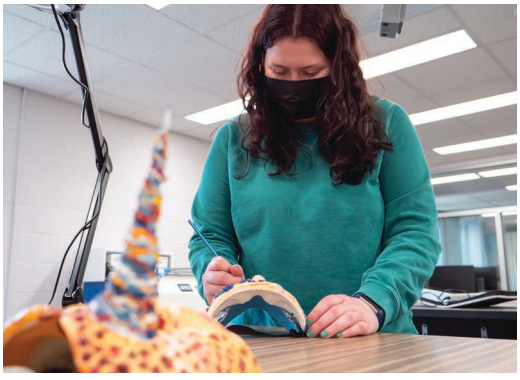
Prototyping Studio provides a maker space for all patrons

Fully operational for half of the reporting period, the Prototyping Studio, which includes 3D printing technology and equipment for creating electronics, laser cutting, vacuum forming, clay modeling, sewing, and screen printing, has already proven a valuable resource for students and faculty across campus.

Since its opening in January 2022

1,400
projects created

597
individual walk-in uses



120
capstone Students

120 engineering students in College of Engineering's senior design capstone course used the studio's space and technology and library staff expertise to create their capstone projects. The Fusion Studio, now Project Design Studio, served as the students' primary planning and consultation space.

Student employee Atlas Vernier demonstrates the new technology. Photos by Chase Parker.

Expansion of virtual environments studio gives all students and faculty more opportunity to explore

The Virtual Environments Studio in Newman Library began as a single room and introductory space for patrons to experience first-hand this emerging technology. Now, the studio features three rooms including a computer lab with machines that patrons can use that are powerful and contain high-end software for immersive environments research and development. In the studio's advanced research space, the community can access 360 cameras, PC connected and standalone headsets, and devices such as motion capture and volumetric capture systems. The space also houses the applied research in immersive experiences and simulations (ARIES) program, which gives, which gives students the opportunity for paid work on collaborative immersive environment projects with external partners.

Most recent upgrades to the space include a 16 camera Optitrack motion capture system to enable multiple actor capture and a 10 camera volumetric capture system, which will allow for real-time streaming of a 3D environment.

"Volumetric capture is a fairly cutting-edge technology right now, so by offering it to students we hope to get them experience with technology that will make them very desirable on the job market," said Jonathan Bradley, assistant director of learning environments and innovative technologies. "We also hope that faculty can benefit from access to technology that allows them to do new innovative research without building and maintaining a complicated and costly system themselves."

The space also offers a Varjo XR-3 headset, one of the most advanced XR headsets on the market, which allows for more advanced eye-tracking and augmented reality pass-through than exists on current consumer-grade headsets.

"The Varjo XR-3 is an enterprise headset with many advanced features that you cannot find on consumer-grade headsets, and its presence in the studio not only gives students and faculty a chance to perform research that might not be possible with other headsets, but also gives our students direct experience with a headset that is often used by large enterprises in technology fields."

Because the University Libraries offers emerging technologies to all patrons, this studio gives students and faculty an opportunity to explore the systems with library experts and push its limits in research and discovery.

University Libraries helps create access to rare dinosaur bone collection through immersive environment technology

Todd Ogle, executive director of applied research in immersive experiences and simulations (ARIES) at University Libraries is partnering with a team of Virginia Tech scientists to bring museum exhibits to life by creating a complete digital skeleton that serves as the centerpiece of an immersive educational experience.

The Modern Skeleton: Translating natural history into interactive and immersive experiences project was made possible by a $25,000 Institute for Creativity, Arts, and Technology (ICAT) Major SEAD Grant. The team aims to close the gap between static skeleton displays in museums and digital access to the wealth of information they possess.

This digital skeleton was created from the original fossils of the Teleocrater Rhadinus which means "slender complete basin." It will be 3D printed as a freestanding skeleton that incorporates an augmented reality app to share information about the importance of the animal, how the animal was found, and how the augmented reality experience was created.

Living over 245 million years ago during the Triassic period and predating dinosaurs, the Teleocrater was unearthed in Tanzania East Africa and named by Virginia Tech paleontologists in 2017. This creature is a cousin to the dinosaur, has a long neck and tail, walked on four crocodylian-like legs, and was approximately 6-7 feet long. The carnivorous Teleocrater is one of the oldest relatives of dinosaurs that has ever been discovered and its bones are temporarily housed on Virginia Tech's campus.

"The paleontology itself is a big deal," said Ogle. "With refinement, these ideas and approaches developed in the project might just find their way into larger places like the Field Museum in Chicago or internationally known museums like the National History Museum in London. That is a big deal!"

ARIES is responsible for developing the augmented reality (AR) app as well as the optimization and AR preparation of the 3D models of the bones that Max Ofsa, Prototyping Studio manager, scanned from original fossils. University Libraries' 3D scanning technology is highly accurate and captures not only the shape of the bones but also the texture and color. The project will make engaging experiences for visitors of the Virginia Tech Museum of Geosciences the augmented reality app.

A team of library student employees are assisting with this project. "Our students are not only interested and engaged but capable of developing the immersive experiences," said Ogle. "Student artists and programmers, when working directly with subject matter experts, can make immersive experiences that are meaningful and impactful for others while gaining valuable experiential learning opportunities for our students themselves."

The use of AR to enhance museum experiences has been mainly in the hands of large institutions, working with corporate partners like Google and Framestory. This team's approach intends to make these experiences more accessible with a higher impact.

"We are stubbornly sticking to our goal of accessibility, which means delivery via the web," said Ogle. "That poses challenges for augmented reality development today, but we believe that it is the direction we must head for the future."

Ogle has been passionate about augmented reality for 20 years and museums his entire life. "Bringing the two together and working with world renowned experts in paleontology, while making such experiences accessible to our own students at Virginia Tech, is a career highlight for me."

Student employees collaborate on creation of the app. Photos by Chase Parker.

GOAL

ENSURE INSTITUTIONAL EXCELLENCE

University Libraries will continue to be a collaborative partner in the university's academic enterprise by optimizing the efficiency and effectiveness of existing library programs and promoting collaborations beyond internal and external boundaries.

The University Libraries is a key university-wide partner in research impact and intelligence to help advance university programs that are a**mong the best in the world and help them achieve international reputational excellence**.

Connie Stovall, research collaboration and engagement team member in her home office. Photo courtesy of Connie Stovall.

Research collaboration and engagement provides data that track impact and build partnerships

Library expert faculty collaborated with and provided competitive landscape analysis for teams working on quantum information and science, engineering, advanced manufacturing 4.0, wireless technologies, and transportation. This offers university teams an opportunity to build relationships and partnerships with potential academic, national lab, and industry collaborators that have potential to increase the university's international impact and reputation.

The library also provides dashboards and visualizations of relevant data such as HERD NSF, NIH, IPEDS, or bibliometrics and altmetrics related to benchmarking our place among AAU or other peer groups. Library faculty have branched out to using these data to inform recruiting for critical positions. The team now works with the Office of Research and Innovation to offer workshops and outreach for Funding Institutional, Scival, and others to foster competitive intelligence across campus.

The library supports proposals to secure more extramural research funding. For example, the team systematically collected and developed dashboards for GlycoMIP, the $23 million NSF funded partnership between Virginia Tech, University of Georgia, Brandeis, Rensselaer Polytechnic Institute, and University of North Carolina, to comply with the National Science Foundation request for annual impact and quarterly performance data that includes articles, citations, and publication percentiles.

University Libraries strives to help Virginia Tech make an economic and human impact. Many academic librarians are already perfectly suited to providing competitive intelligence and analysis to help campus leaders and researchers plan more strategically.

Nathaniel Porter teaches computer languages. Photo by Melissa Vidmar for Virginia Tech..

Next generation leaders gain hands-on training in data science from Virginia Tech and Microsoft to address challenges in agriculture and rural communities

Partners across Virginia Tech recently received a $748,000 grant from the National Institute of Food and Agriculture to fund an annual 10-week research internship for undergraduates in data analytics in agriculture, community, and rural economics program referred to as DATA-ACRE.

The DATA-ACRE grant provided the platform for Virginia Tech to continue to develop the Data Science for the Public Good program, which was first piloted in 2020 as a part of a joint initiative across three states and five universities to conduct data science training to tackle the challenges surrounding processes in agriculture and food production. This type of training will develop next-generation leaders working to ensure prosperous rural communities, and continued agricultural productivity in rural communities worldwide.

The Department of Agricultural and Applied Economics in the College of Agriculture and Life Sciences, Virginia Cooperative Extension, and University Libraries led the program. As part of the training, students learn computer languages R and Python, as well as how to extract and use data from publicly available sources. This crucial skill set provides students with the confidence and knowledge to convert raw information into graphic formats so they can learn how to analyze data to make interpretations and predictions.

Nathaniel Porter, co-principal investigator and University Libraries social science data consultant and data education coordinator, helped develop and teach the curriculum.

“The program allows us to provide opportunities to a diverse body of students with an increased emphasis on attracting new talent to data analytics in the agriculture and social sciences,” said Porter.

While the program is primarily held on the Virginia Tech campus, the students visited the University of Virginia’s Social and Decision Analytics Division in Washington, D.C. and The Microsoft Garage in Reston, Virginia, for mentoring activities.

With a 31 percent projected employment growth in data science through 2030, programs like these answer the demand for this field of expertise.

IN CONCLUSION

The last year has included a major shift through virtual, hybrid, and finally to in-person services. Our services and expertise followed and supported those university shifts. Now, we are seeing the return of pre-pandemic activity and engagement. The University Libraries looks forward to building on the lessons learned over the last year and enhancing Hokies' learning, teaching, research, and discovery journeys.

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