Tomorrow, Visualized | Library by Design

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MACROVISION High-def MacroTiles make up a giant screen in the NCSU Hunt Library's iPearl Immersion Theater. *Photo by Marc Hall/ NCSU*

As I got ready to tour the James B. Hunt Jr. Library at North Carolina State University (NCSU), Raleigh, last spring, as part of the Association of Research Libraries (ARL) meeting held nearby, the buzz about the newly unveiled building had reached such a level that I expected to find it, however cool, overhyped.

It wasn't. It was exactly the right amount of hyped.

"Every corner of the Hunt Library is designed to be memorable and stunning," the library's vision claims. Grandiose as that might sound, those corners deliver.

In an era in which many libraries even at great institutions are struggling to do enough with less, it's refreshing to see a university able and willing to invest in the library as both the symbolic and the operational core of the institution. The project was funded by $115.2 million in state appropriations, plus donor support.

Building an inspiration

The vision for the Hunt Library is ambitious in the extreme: to "create spaces that encourage collaboration, reflection, creativity, and awe" and "to be a place not of the past but of the future." The university made such an investment because it feels the library will be a competitive advantage. "A signature library," Susan K. Nutter, vice provost and director of the NCSU Libraries and the 2005 *LJ* Librarian of the Year, explains "would help us recruit the very best students and the very best faculty and to serve the community as an inspiring place of excellence and passion and ideas and vision.... You cannot be in this building without realizing that something very important is happening at this university."

"This building was designed from the start to be an icon, a dramatic representation of how transformational technology and a commitment to the growth of our community will thrust [NCSU] even further into the foreground," said Chancellor W.

Randolph Woodson when the library officially opened in April.

The library is indeed iconic and anchors the universities' new Centennial campus. One of the ways it does so is in the thoughtful integration of technology. For all that the Hunt features cutting-edge technology deeply baked into its design, it never gives the impression that any piece of tech is there only because it can be. Each piece has been thought through to serve a present user need, as well as to adapt to changing needs of the future.

"Much of the design strategy behind the [library] was to pour our resources into the sorts of spaces and technologies that support NC State's reputation for producing students and researchers who live easily and naturally with technology and learn through collaboration," explains David Hiscoe, director of communications strategy for the NCSU Libraries.

Since NCSU and the other research triangle academic institutions nearby—Duke University and the University of North Carolina (UNC) at Chapel Hill—are the hub of a thriving community of technology firms, part of the mission of the library is to support not only students and faculty but the corporate, government, and nonprofit partners that work with the students and scholars on Centennial's campus.

Designing a process

The Hunt Library wasn't built in a vacuum, or according to the vision of a single person. Snøhetta, the Hunt Library's lead designer, also helped refine the master plan for the Centennial campus as a whole to accommodate the 221,000 square foot library and "more forcefully integrate" the existing terrain. (The firm also designed the Library of Alexandria, Egypt, among many other high-profile projects, and has been honored with the Mies van der Rohe Prize for Contemporary Architecture and the European Award for Urban Public Space.)

North Carolina firm Clark Nexsen (formerly Pearce Brinkley Cease + Lee) served as executive architects, and Meyer, Scherer & Rockcastle, Ltd., developed the NCSU Libraries' master plan in 2002. The program for the library was created in 2008 through an iterative series of interviews, briefings, discussions, visioning sessions, workshops, and meetings. It took an expansive view of stakeholders, meeting with many groups besides students and library staff. In addition to the architects, DEGW did the programming, while Buro Happold worked on sustainability and Davis Langdon on cost management.

Consulting with staff was particularly important, because the Hunt Library was designed to run with no new staff, though Hiscoe says they did get a few new positions when it opened.

Making an entrance

REALLY BIG DATA Putting books in the robot makes room for high-tech data visualization and creativity spaces at the Hunt Library. The striking exterior (l. ctr.) illuminates the Centennial Campus. Innovative features inside include (clockwise, top l.) the Game Lab, the Rain Garden Reading Lounge, the 21'-wide Christie MicroTiles wall in the Game Lab and in the Creativity Studio. Putting such cutting-edge technology in the hands of undergraduates is virtually unheard of, but it gives students a huge leg up after graduation. *Exterior photo and bottom right photo by Marc Hall/ NCSU; all other photos courtesy of NCSU*

From the first floor entrance of the Hunt Library there is not a single book in sight, and there's not a staff member, desk, or chair, either. Instead, the focal points are a staircase and a window, called Robot Alley, through which students and visitors can watch the on-site bookBot machinery in action. The 50′ x 160′ x 50′ bot (actually four robots) is excavated 20 feet below the first floor and houses some two million volumes in one-ninth the space of conventional shelving, delivering the desired title within five minutes and at a substantial cost savings compared to traditional stacks. Nearby, a large touch screen displays Virtual Browse, which tries to replicate the experience of serendipitous browsing in open stacks by showing the titles that would be located near the original book if it were shelved by subject (in fact, the book bot stores books by height in more than 18,000 metal bins).

Once up the stairs, students pass through the Emerging Issues Commons, an airy, high-ceilinged space brought to human scale with curved display walls and an electronic ribbon-style sculpture, which features interactive exhibits created by the Institute for Emerging Issues, a think tank founded by Hunt himself, who served as North Carolina's governor from 1977 to 1985 and 1993 to 2001. (Not many libraries have their namesake actually working in the building, but Hunt does, chairing the institute.) From there, visitors pass into more familiar library spaces. They are greeted by a one-stop service center on the right and a glass-walled Apple Technology Showcase on the left, a gadget bar where students can try out the many devices and technologies available for loan.

Past the service point, the iPearl Immersion Theater is an open area encompassing a large, curved video display wall

built of the Hunt's signature high-definition Christie MicroTiles. This is one of five such display walls in the building. The iPearl showcases current events, library and university initiatives, and the work of NCS faculty and students. During the ARL tour, it was packed with students watching a sporting event, but Hiscoe tells *LJ* it is also well known for displaying student-taken photos of the library itself via the My #HuntLibrary initiative. "Students sent us over 1,700 Instagram photos of Hunt in the months after we did our soft opening," says Hiscoe. "We were quite frankly stunned at the response and how much it showed an appreciation for the new library."

As Hiscoe explains, the lower floors of the library are about community. As users climb higher, the functions get more rarified and the technology more intense.

The library as lab

When people talk about doing research at the university library, they usually mean in books that have already been written or at least in archives. As a result, as Ithaka's fifth faculty survey found this spring, since the advent of remote digital resources, STEM researchers in particular have made less use of library buildings themselves, even as they continue to make great use of the journals libraries provide.

The Hunt responds with a new library role. Since it is the primary library facility for faculty and students in engineering, textiles, and other science programs, NCSU reenvisioned the library as a physical site where STEM research is conducted: not chemistry, biology, or physics experiments but research so new it doesn't already have a home and requires equipment that crosses disciplines and departments, that occurs where big data and the tools to handle it intersect. "At the core of the vision for the Hunt Library is the ability of our students, faculty, and partners to immerse themselves in interactive computing, multimedia creation, and large-scale visualization—tools that are enabling revolutionary ways to see and use information," the library's vision statement says.

The library hosts a Maker space featuring two 3-D printers and a laser cutter, but physical objects are only a small portion of what students and faculty create at the Hunt.

Since NCSU is home to a top video game design program, NC State's Digital Games Research Center, incorporating a game design lab is a no-brainer. The flexible 20′x 5′ Christie MicroTile display allows a single game to be played on a full screen that rivals an art house movie theater; or with multiple stations equipped with eight video gaming systems, several can be played at once. The room also exchanges data with laptops and mobile devices. Housed in a glass box, the lab creates visual interest for other students without the noise that could disturb their studies. For designers who want to make their mistakes in privacy, the glass can be turned opaque.

There's even a student-created video game based on the Hunt Library's book circulation patterns, a collaboration between the college of design and the department of computer engineering. It can be played by four people using Kinect systems, only in the game lab itself and is "an incredible amount of fun," says Hiscoe.

Yet Hunt's offerings of high-tech laboratories for creating and testing original work isn't limited to games or even to work in technological fields. The Teaching and Visualization Lab is just as useful for the digital humanities, if not more so. The "black box" theater design includes 270° immersive projection on three walls, with 3-D capability; a professional-zoned audio system, and cameras for real-time video capture, broadcast, and collaboration. An open ceiling, exposing the rails from which equipment is suspended, makes it easy to swap in even newer technology as it becomes available.

The space is used for everything from control room simulation to big data decision-making to game research, and it's designed with flexible infrastructure to grow with advancements in the field. Among the many uses of this space so far: a recreation in 3-D of the 17th-century cathedral where John Donne preached, earth science students experiencing the birdsong audible in a nearby wild environment, and a simulator to train naval ROTC midshipmen to operate the bridge of a modern warship.

Meanwhile, the counterpoint to the black box of the visualization lab is the "white box" Creativity Studio, which is arts-focused. It has movable and writable walls, a theater lighting kit, 3-D projectors, videoconferencing, and video, film, and animation production for green screen and motion capture.

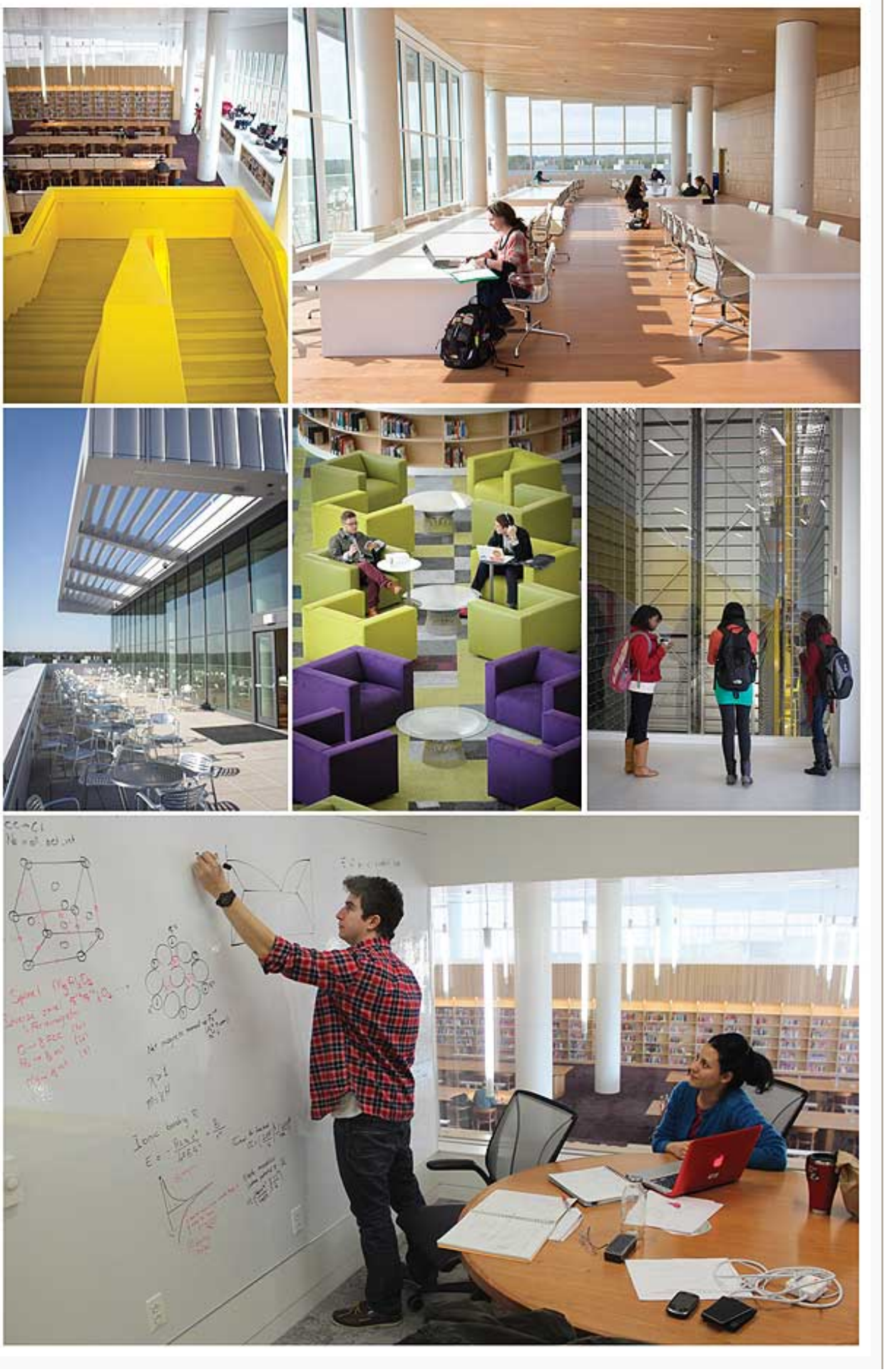
The library itself does its own research—testing new tech for possible incorporation—in a technology sandbox out of the public eye. From that back-of-house area, adjacent to the server room, a single person can run the whole building's voice and video. In addition, cloud-based virtualization of servers and storage means most technical operations can be moved to another building in a pinch. The server room itself "pushed the envelope" on design, Hiscoe says, using a

“hot aisle” in place of a raised floor, which he expects to pay for itself within two years by saving money that would otherwise be spent on cooling. It, too, was designed to grow to twice its current capacity, with extra racks and cabling.

As always, of course, cutting-edge technology is a fast-moving target. Hiscoe tells *LJ* that some of the original plans for the tech infrastructure had to be scrapped because the equipment was putting out too much heat in the visualization lab. The Hunt tech staff had to increase the number of racks in the server room instead.

Seen and heard

AV technology is central to the Hunt Library's mission. In addition to the intensely technical lab spaces, a presentation practice room offers a place to rehearse and record live



CONTEMPLATION & COLLABORATION (top row, l.): Dorothy and the Oz troops would appreciate the yellow staircase that leads down to the Quiet Reading Room; (top row, r.) the Skyline Reading Room, plus terrace (middle row, l.), offers unobstructed views of the Centennial Campus. No room for dry conversation in the stimulatingly hued Rain Garden Reading Lounge (middle row, center). Students in Robot Alley study the space-saving bookBot, which frees room for other uses (middle row, r.). Whiteboards are as key to 100 group study areas as wireless (bottom). *Middle row center and right photos by Marc Hall/NSCU; all other photos courtesy of NCSU*

presentations in a seminar room setting: perfect for massive open online courses (MOOCs) or flipped classrooms. A video seminar room features a telepresence video collaboration suite for working with scholars who could be on the other side of the world. Two media production studios offer state-of-the-art tools for creating and editing digital media, including a green screen curtain system; four music rooms are equipped for audio recording, creating and mixing music, audio and video transfer, and digital media editing, including MIDI keyboards as well as and digital media workstations.

Meanwhile, in the "fishbowl," users are the visuals: the glass-walled seminar room is "uniquely designed to promote the open exchange of ideas," since passersby can watch those inside make use of a perceptive Pixel multitouch display. The room is popular with visiting recruiters, among others. In the Usability Lab, those inside are watched in another way: it is equipped with video-capture cameras and tools for assessing user interaction with software and interfaces.

All told, the school invested $9 million in technologies, which were pretested for two years by Maurice York, head of IT for Hunt and a 2013 *LJ* Mover & Shaker, and his 22-member team. York even converted an office in the old library into a "Mini Hunt"—a scale model of the technology infrastructure of the Hunt Library, with computing, digital imaging, and "digital media backbone" technology, funded by $300,000 in donations and equipment loans from tech companies Dell, Christie Digital, and Extron Electronics. Nothing was wasted. "The Mini Hunt was actually built from components of the 'real thing,' so its pieces are now part of the actual walls over in Hunt," Hiscoe tells *LJ*. Amazingly for a building that requires so much electricity, it still manages to be Leadership in Energy & Environmental Design (LEED) Silver certified, with ecofriendly touches like batting made from recycled blue jeans to help shape the acoustics of the space. Given how much of this library is about aural as well as visual experiences, it makes sense that the soundscape is as carefully designed as what meets the eye.

Uniquely Hunt

Aaron Moser, director of the Moser Contract division of library furniture manufacturer **Thomas Moser**, designed a Bank of England–style chair specifically for the Hunt Library and named it the Hunt Chair. Some 125 of them, with accompanying tables, were installed in the Hunt Library's Quiet Reading Room.

The collaboration marks the third time Thos. Moser has partnered with NCSU. Moser presented the chair to its namesake, James B. Hunt, a former governor of North Carolina, at a dinner honoring the library.

Making room for people

While design, in the sense of intentional construction of spaces for use, is everywhere in evidence in the labs, their highly reconfigurable nature and changing displays tend to make the look of the physical components themselves fade into the background. Elsewhere at the Hunt, a distinctive visual aesthetic is more in evidence in glass walls both interior and exterior, open plans, wildly colorful seating, and more Christie MicroTiles configured into a variety of shapes.

The Hunt is engineered for everything from solo work to many kinds and sizes of collaborative projects up through mass events. Simply put, the library spaces are just plain fun. They are spacious but never cavernous, with plenty of intriguing nooks and little livable touches that make the patron experience seamless, such as lockers that include outlets for students to store and recharge their laptops and other gear at the same time.

For solo work, or relaxation, the library offers the Rain Garden Reading Lounge, a popular subject of My #HuntLibrary photos. It includes colorful

soft seating and low curved shelves that house current reference materials, new and classic works in engineering, computer science, and textiles; publications by NCS authors; and a circulating sf collection.

Photos are often taken from the balcony lounge, which overlooks the rain garden and features more colorful, contemporary furniture. As does the entire library, which has 75 different kinds of chairs in 115 colors, including one custom-built for the library by furniture crafters Thos. Moser (right). Why so many? “The spirit of this building is the spirit of discovery; we want that sense of play,” Hiscoe says. Playful as they are, and as much fun as he says they were to pick out, the furnishings were also all designed to stand up to heavy use. All told, the Hunt holds about 1,750 seats, doubling NCSU’s seating capacity to ten percent of its student body, though still short of the UNC’s standard of providing library study seating for 20 percent of the student population.

An oval view reading lounge houses recent publications in computer science, textiles, and engineering, selected print journals from publishers such as the Institute for Electrical and Electronics Engineers (IEEE), and seminal titles such as *Science* and *Nature*. Meanwhile the Quiet Reading Room, while airy and sleek enough not to be out of place, is the most traditional-feeling library space in the building. Except for the staff-only bookbot section, it is the only spot in the library to have that old book smell. “There needs to be a library somewhere in this library,” Hiscoe quips. The reading room is set off from the open plan with high shelves and features tables and the Moser seating. When the ARL tour came through, every seat was full.

The Lake Raleigh Learning Commons features computer workstations set up both for individual and collaborative work, with floor-to-ceiling windows on three sides and views of the lake (according to Attention Restoration Theory, viewing nature through windows helps students focus better). The NextGen Learning Commons includes interactive computing, gaming, and new technologies.

For collaborative work, apart from the specialized labs, almost 100 group study rooms include whiteboard walls; flat-panel displays; thin-client computers; web-based video conferencing; a table cubby with laptop, power, and auxiliary connections; speakers; and a touchpad controller. There are other, less traditional alternatives for group work as well, such as the “Idea Alcove,” an open space with whiteboard walls and table seating. Also, free-range rolling whiteboards are available; a surprising number were in use by students collaborating in the open areas. Graduate students and faculty have their own dedicated spaces for both individual and group work, which require ID to access, so they can work apart from undergraduates.

For the largest groups, an auditorium with a raised stage and seating for 390 doubles as a classroom and event venue. A multipurpose room serves as meeting and presentation space for the Institute for Emerging Issues. There’s also an auditorium-style presentation room within the institute with fixed seating for 92. The Skyline Reading Room and terrace on the fifth floor, the highest point on the lush green NCSU campus, can be turned into an elegant event space for university functions.

It is a capacity that will likely be called on to house the library community, itself eager to be inspired, again and again. In addition to the ARL event this past spring, the Hunt will host on October 6–8 the second annual Designing Libraries for the 21st Century Conference. Rightly so.

For more on the Hunt, see Rebecca Miller’s editorial, Learning from NCSU.

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and reimagined library spaces throughout the United States.

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