



Professor Cindy Gordon directs OU's human anatomy program and oversees "Bones on Loan," the first program of its kind in Oklahoma.

SOPHIA ARMOURDIAN

Bones on Loan

A 3D COLLABORATION BETWEEN OU LIBRARIES AND BIOLOGICAL SCIENCES BRINGS PRINTED SKELETONS TO STUDENTS' HOMES.

By Chip Minty

EVERYONE KNOWS that a picture is worth a thousand words, but for anatomy students learning the human skeleton, nothing is better than holding a femur, vertebra or skull in the palms of their hands.

That's because each little facet is significant, says Cindy Gordon, professor and director of the human anatomy program in the University of Oklahoma's School of Biological Sciences. The flat surfaces, tiny openings, bumps and subtle features that

may go unnoticed by a casual observer are important to anatomy students.

"All the detailed structures mean something," she says. "So, students need to see those kinds of things in person."

When it comes to learning about the human body, Gordon says it has always been important for students to touch bones, feel them and turn them over in their hands. That used to mean long hours inside anatomy labs and libraries with human bones or molded replicas that are ei-

ther too fragile or too expensive to take home.

But a grant from OU's Dodge Family College of Arts and Sciences now makes learning about bones more accessible to Gordon's anatomy students through a unique program called "Bones on Loan."

Students can check out exact replicas of scanned human bones made with 3D printers that represent all the details they need, Gordon says. And if a student takes a femur home, drops it and something snaps

off, a new one can be printed at minimal cost.

She says her students are focused on various professional fields, ranging from nursing and physical therapy to physician assistants, pre-med and dentistry.

"We started Bones on Loan to make study bones more accessible and affordable," Gordon says. "A lot of our students live in Oklahoma City, Edmond or Yukon and work outside of school or have families. To be able to check out a bag of bones for the night or over a weekend is huge. They can also share it among their study group."

Guided by computer-aided design, otherwise known as CAD, 3D printers can create three-dimensional objects through a layering method that uses plastics, composites, bio-materials or other constituents. The first 3D printer emerged in 1981 and the technology has continued to develop into a standard tool now used in aerospace, architecture, manufacturing, healthcare and many other industries.

While the 3D printer might be the workhorse of this revolutionizing technology, a 3D scanner is the driver.

Emerging Technology Librarian Kristi Wyatt says OU's 3D Scanning Lab and the Research 3D Printing Lab at Bizzell Memorial Library have been scanning and printing bones for anatomy students for about five years, but the two Artec Space Spider Scanners that Gordon acquired in collaboration with University Libraries last spring have been game changers. The units' advanced scanning technology results in higher-resolution 3D prints that represent more accurate and detailed duplicates of original bones, she says.

"These scanners have opened opportunities for many

departments and research labs at OU,” Wyatt adds.

That is what Gordon was hoping for when she applied for the grant. She knew the scanners and accompanying computers had the potential to help students in other academic disciplines.

“We quickly realized they were going to have universal usage,” Gordon says. “They have already started to benefit so

many people besides human anatomy students, including other undergraduates, graduate students and researchers.”

The new 3D scanning equipment is far more economical than purchasing real bones or even hand-made replicas, which can cost hundreds of dollars apiece. And at those prices, students would not be allowed to carry them home.

There is no other program

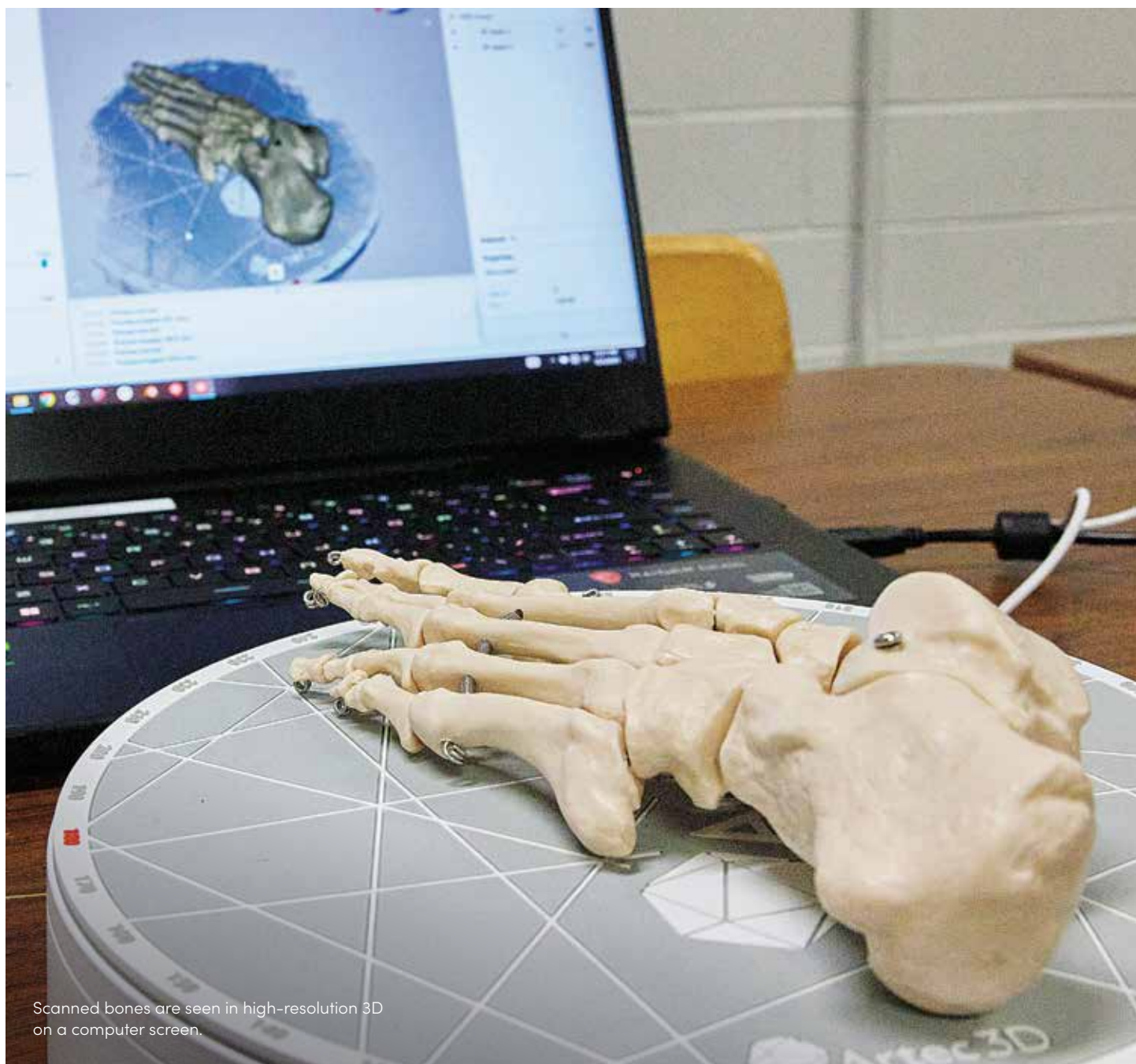
like Bones on Loan in Oklahoma, Gordon says, but that doesn’t mean students from other schools can’t benefit. Wyatt hopes to make OU’s 3D scans—detailed images that can be turned, manipulated and studied on a computer screen—widely available online.

Gordon says the future impact of Bones on Loan may be broad. However, much like bones themselves, it’s the de-

tails that matter.

“Our students, our student-athletes, our single moms, our single dads, people with kids and jobs struggle to find time to physically go to the lab,” she says. “But they can now study at home after they put their kids in bed.”

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Scanned bones are seen in high-resolution 3D on a computer screen.