

Mixed reality gives neuroanatomy lessons a boost

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Credit: University of British Columbia

With its unique hemispheres and intricate connections, the brain is one of the most exceptional, yet complex organs in the human body. The intricate structure has posed a unique challenge for generations of students looking to understand and ultimately master how its many parts fit, and work, together.

But this fall—thanks to Microsoft HoloLens and mixed reality technology—UBC students will get to visualize the brain's 3-D structure

in a way they never have before.

"The first time I put on the HoloLens, I was blown away by what I saw," said Parker Holman, a PhD candidate in neuroscience at UBC. "To be able to walk around and fully explore a detailed hologram of the brain from every angle is an experience that you can't quite put into words."

UBC has teamed up with a group of interns from the Microsoft Garage to develop a new app for HoloLens, the world's first fully self-contained holographic computer. The new app, known as the Holographic Brain Project, will serve as an interactive teaching tool to guide students through a virtual exploration of the brain—highlighting, isolating, expanding, and rotating its many structures.

"There's no denying that the human brain is extremely complicated and that makes neuroanatomy difficult to learn and teach," said Dr. Claudia Krebs, a professor of anatomy in UBC's faculty of medicine. "We're very excited to be introducing the world of [mixed reality](#) into the classroom."

Holman and Krebs worked together with postdoctoral fellow Tamara Bodnar to help inform the development of the new Holographic Brain Project application at Microsoft. They believe the new technology could be a game changer for neuroanatomy instruction at the university.

With advances in visualization tools and applications, like the Holographic Brain Project—which allows for the overlay of two-dimensional MRI scans on corresponding sections of the [brain](#)—learners are given an opportunity to dive deeper into neuroanatomy than ever before.

"As a young student studying neuroanatomy, I only had two-dimensional images in textbooks," recalls Bodnar. "It was difficult to get a true

understanding of the spatial relationships that existed."

In the coming weeks, Krebs, Holman and Bodnar will undertake a research study to assess the educational value of the Holographic Brain Project in neuroanatomy education. The application will be used in conjunction with the many existing educational resources at UBC to help make [neuroanatomy](#) more approachable.

"Microsoft's HoloLens is another great tool for our teaching toolkit," said Krebs, who has been a staunch advocate of adopting new technologies and video to enhance the learning experience for her students.

Development of the application offered a unique opportunity for UBC to work directly with developers at Microsoft in Vancouver. The team was comprised of Canadian university students from the company's Garage Internship Program, and their coaches.

According to Gail Murphy, vice-president, research and innovation at UBC, the faculty of medicine's Holographic Brain Project represents the first of many HoloLens applications that will enhance education and research underway at the university. Last fall, UBC received 10 Microsoft HoloLens devices, donated by Microsoft.

"UBC is a growing innovation hub and we're eager to explore how new partnerships and technology can help us continue to advance and transform our education and research space and methods," said Murphy.

Provided by University of British Columbia

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