

Print Your Brain

The anticipation stretches out for six months: What will it be like to hold your own brain in your hands, take it home with you, and put it on your desk? At the Center for Cognitive Neuroscience at Freie Universität Berlin, students from across all member institutions of the BUA can experience an unusual teaching research project

Brain from a 3D printer:
Computer science student Michael Migacev
is contributing to the project as a tutor.



Around 60 students have experienced this anticipation over the past two years – and at the end of their Print Your Brain course, they each received their very own brain, freshly printed from a 3D printer in their choice of white, gold, black, or purple.

This one-of-a-kind course at the Center for Cognitive Neuroscience Berlin was made possible with funding from the BUA. It started out as the StuROPx X-Student Research Group and will be continued as a teaching research project for students called “StuROPx X-Tutorial.” The idea came from Timo Torsten Schmidt, coordinator of the master’s program in cognitive neuroscience at Freie Universität Berlin. “During the coronavirus pandemic, I thought about what kind of project could bring the students together,” says Schmidt. He applied to the BUA with his idea, received funding, and was given the opportunity to offer this course to students from all four BUA institutions.

However, before students can hold a 3D-printed model of their brain in their hands, they must first exert their physical brains. This requires several steps, which Michael Migacev, a master’s student in computer science at Freie Universität Berlin, guides students through in the tutorial.

First, the students are placed in a magnetic resonance imaging (MRI) scanner, which takes images of their brains. The device is located in the Center for Cognitive Neuroscience Berlin, right next to the campus of Freie Universität Berlin. “It’s great that we have equipment like this here reserved for research purposes,” says Schmidt. The MRI scanner is used by scientists from across the Berlin University Alliance, for example, for studies on working memory or language processing.



Timo Torsten Schmidt
coordinates the
master’s program in
cognitive neuroscience
at Freie Universität
Berlin.

Second, the brain images must be converted into 3D models. Students learn how to do this in the course. Once the model is ready, it only takes 24 hours to print. However, anyone expecting their brain to reveal particularly interesting contours or protrusions that might indicate mathematical genius will be disappointed.

“There are visible differences between the brains, but they do not allow any conclusions to be drawn about performance or strengths and weaknesses,” says Schmidt. Thinking is a complex process in which the interaction between different areas of the brain plays a greater role than their anatomical form.

One conclusion is clear though: the course strengthens cooperation between the BUA partners. “It’s very interesting to work with students from different universities and disciplines – psychology, computer science, neuroscience,” says Schmidt. This is because each BUA institution has a different focus in neuroscience: The Bernstein Center at Technische Universität Berlin is dedicated to computational neuroscience; Humboldt-Universität zu Berlin offers a degree program in “Mind and Brain” that combines neuroscience and philosophy; Freie Universität Berlin focuses on empirical research into questions of cognition, and Charité – Universitätsmedizin Berlin concentrates on neurological and psychiatric diseases and their treatment.

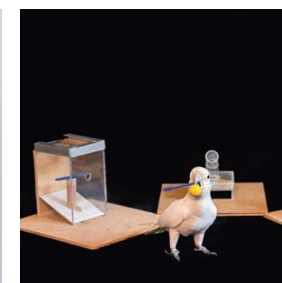
In the current semester, students are working with Michael Migacev on an exhibition called “The Diverse Brain.” The plan is to present it at all four BUA institutions. Part of the display includes hollow brains that Migacev has printed out and equipped with LED lights inside. The lights are meant to indicate which brain areas are active, but they are certain to light up in the minds of visitors as well.

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Digital Collections

Over the centuries, Berlin researchers have collected objects, models, and sculptures, which are scattered across archives and institutes. Yong-Mi Rauch, head of the Historical Collections Department at Humboldt-Universität zu Berlin, explains how she and her team are making these treasures accessible to everyone



Yong-Mi Rauch works high up on the sixth floor of the Jacob-und-Wilhelm-Grimm-Zentrum at Humboldt-Universität zu Berlin. Just outside her office door, there are several pieces of furniture that could have come from a museum: a majestic card catalog cabinet made of dark wood, as tall as a person, and an archive cabinet painted with an Eulenspiegel figure, which was once used by Theodor Fontane and his fellow writers in the “Tunnel über der Spree” literary society.

But the head of historical collections at Humboldt-Universität zu Berlin makes it clear right away: “We’re not in a museum here. ‘Academic collections like ours serve other purposes. Even inconspicuous objects that would not be suitable for an exhibition can have great value for researchers.’”

Over decades and centuries, researchers in Berlin have collected thousands upon thousands of objects, illustrations, specimens, documents, sculptures, and models, which are scattered throughout the city in storehouses, institutes, libraries, and archives. What do you do with this wealth of historical artefacts? “Researchers are constantly asking new questions about collections, and that means they need to be optimally cataloged and made digitally accessible,” says Rauch. And, of course, not just for members of the respective institute, but for everyone.

Thanks to funding from the BUA, this is now much easier than it was a few years ago. Rauch’s first step, back in 2021,



Further
information:
[berlin-university-
collections.de/en](https://berlin-university-collections.de/en)



Yong-Mi Rauch
heads the
Historical Collections
Department at
the Humboldt-
Universität zu Berlin
Library.

was to assemble a small team and conduct a feasibility study to determine what would need to be done to display the collections of all four BUA partners on a single platform. This platform is now available online and provides access to over 100 teaching and research collections held by the BUA institutions.

The online platform allows you to click on a specific field of research – for example, Earth sciences – and see right away what items the BUA partners have to offer, from the crystallographic teaching collection at Humboldt-Universität zu Berlin to the mineralogical collections at Technische Universität Berlin to the ore collection in the geochemistry department at Freie Universität Berlin.

However, the work of Yong-Mi Rauch and her team, which has secured BUA funding up to the end of 2027, does not consist solely of compiling this information. They also offer workshops and events to train people in how to manage and catalog collections; they also showcase projects related to the collections on the platform. “Our task is not to digitize the collection items themselves,” explains Rauch. That work is done by the individual institutes in a decentralized manner. “But we advise our colleagues on how best to prepare the objects or index cards for digitization and how to tag them with metadata.”

According to Rauch, the overarching goal of the project is to “better connect the collections with each other and provide a basic infrastructure that can be used by all universities in their teaching and research