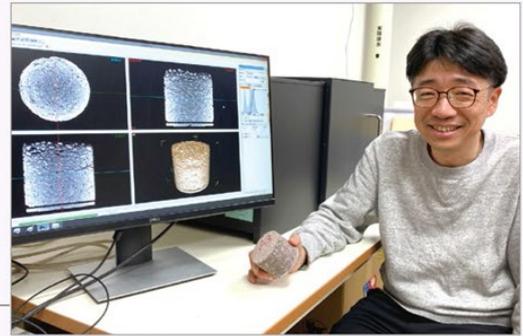




You can see the frozen contents as they are. I thought "it's awesome!"

Shinshu University, Faculty of Engineering
Water Environment and Civil Engineering
Professor Takashi Kawamura



Research on Freeze-Thaw in Soil Pavement

Soil pavement is a paving method that combines soil with cement as the material. It is softer than asphalt, making pedestrians easier to walk on, and its natural color blends well in parks and sidewalks.

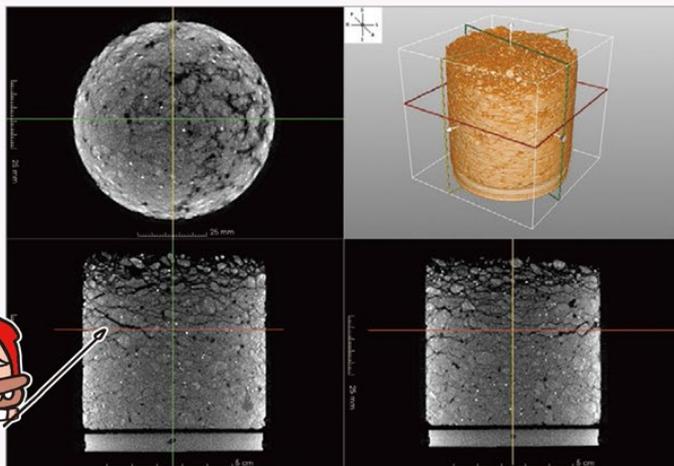
However, in cold regions, there was a concern about frost damage causing cracks due to the expansion of water that penetrates the pavement and freezes.

Previously, we immersed test samples in water, repeatedly froze and thawed them, and then collected the broken pieces to see how much they had deteriorated. This method was time-consuming, and we couldn't observe the state while they were frozen.

By using CT, we can now observe the inside of the test sample while it's frozen, greatly advancing our research.



Compared to concrete and asphalt, soil pavement is more porous, allowing water to penetrate easily, which helps to control temperature rise. It doesn't become muddy like plain soil, making maintenance easier.



CT images: Observing the occurrence of cracks and delamination.

In the field of civil engineering, the ground below the surface is also a research target.

Knowing the density and condition of the soil is important for disaster prevention and constructing buildings and structures. I believe it would be helpful to collect samples from the ground using boring and observe them on site.

In the future, there may come a time when each civil construction site will have a CT machine.



Immerse the test sample in water, freeze it, and take CT scans with the container.



Repeated experiments by changing the composition of soil and cement.

Check out this data in a video





The CT enables the creation of highly precise skeletal replicas, boosting work efficiency

Amphi Liability Company
CEO Akio Sasaki

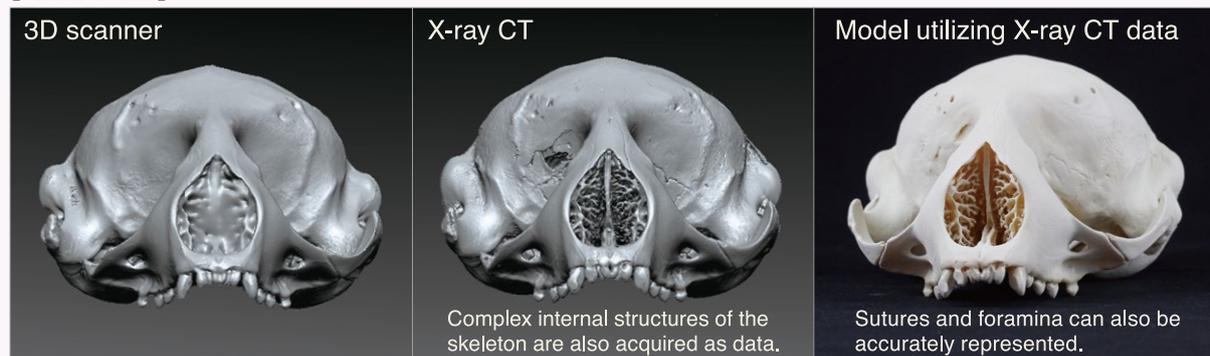
Ideal for models used in museums and universities

Skeletal replicas are used in museum exhibits and as tactile educational materials.

While casting is an available method, our company specializes in producing highly detailed models by first obtaining 3D data, then 3D printing the models, and finally completing them with meticulous manual cleaning and coloring for utmost precision.

Common methods for acquiring 3D data include using a 3D scanner to measure surface details or photogrammetry, which creates data from multiple photographs. However, an X-ray CT scanner is necessary to capture the internal structure of the skeleton. The difference becomes obvious when comparing models of a seal's skull. By utilizing X-ray CT data, we can accurately replicate the complex structure of the nasal cavity in the model. This advancement also removes the necessity of manually reconstructing the sutures through conventional molding and coloring techniques. *Joints between bones

[Seal Skull]



As additional advantages, parts like ribs and vertebrae, which can be difficult to reproduce accurately in terms of position and angle when disassembled, can be precisely acquired as digital data by simply scanning frozen specimens or those preserved in liquid using CT. NAOMi-CT enables the process to be completed in no time.

CT minimizes contact with valuable specimens while enhancing their features. This technology is essential for museums and similar institutions dedicated to digitalization and universal design, facilitating the creation of tactile exhibits that are accessible and easily understood by children and individuals with visual impairments.



Gloydus blomhoffii, also known as Mamushi, has multiple delicate ribs. With the introduction of CT, it has become

possible to create models from liquid-preserved specimens. Previously, data was obtained for each individual bone using photogrammetry.

Amphi Liability Company
<https://amphillc.com>



Specialized staff in biology and art collaborate to create models. Sales of models to the public are also popular. Since 2023, the 'Kimino Nature Experience Center' has opened, offering experiential events such as model painting and creating biotopes.



Various CT images are available in video format.

