

# KAWAGUCHI LAB.

## [Spatial Structures as Architectures for Human Beings]



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### Safety of Large Roof Buildings

Ceilings in large roof buildings such as gymnasiums and halls tend to be high and large. In the buildings, however, falling of ceiling panels and lighting equipment have often occurred irrespective of earthquakes. If once small damage to the ceiling was found, the buildings cannot serve as shelters which are frequently requested functions during disasters.

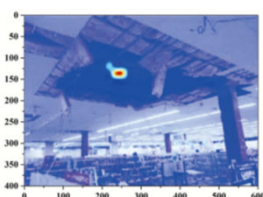
During the main and after shocks of the East Japan Earthquake on March 11, 2011, failures of non-structural components had occurred in many large roof buildings. Harming people due to the falling of ceiling panels had occurred as well. We have been investigating the safety of large roof buildings and developing the method to prevent the falling of ceilings.

### Structural Performance of Buildings

We have been researching and developing various buildings which practically use advantages of spatial structure. The application of living plants for building structures is also investigated.



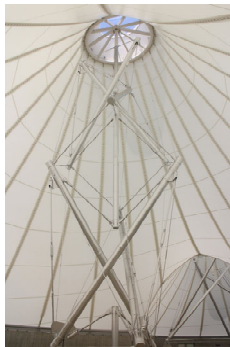
Great East Japan Earthquake



Failure Detection with AI



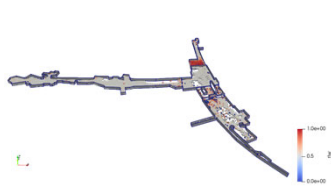
2016 Kumamoto Earthquake



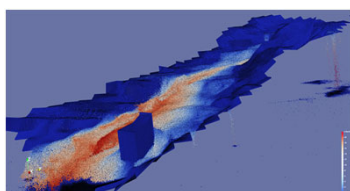
Real-scale tests of the safety net



Ceiling reinforcement with cables



Inundation simulation of Shibuya underground space



Numerical simulation of sediment disaster at Atami

