

# KAWAGUCHI LAB.

## [Spatial Structures as Architectures for Human Beings]

Department of Human and Social Systems

Building Structure, Spatial Structure

Department of Architecture, Graduate School of Engineering

<http://space.iis.u-tokyo.ac.jp>

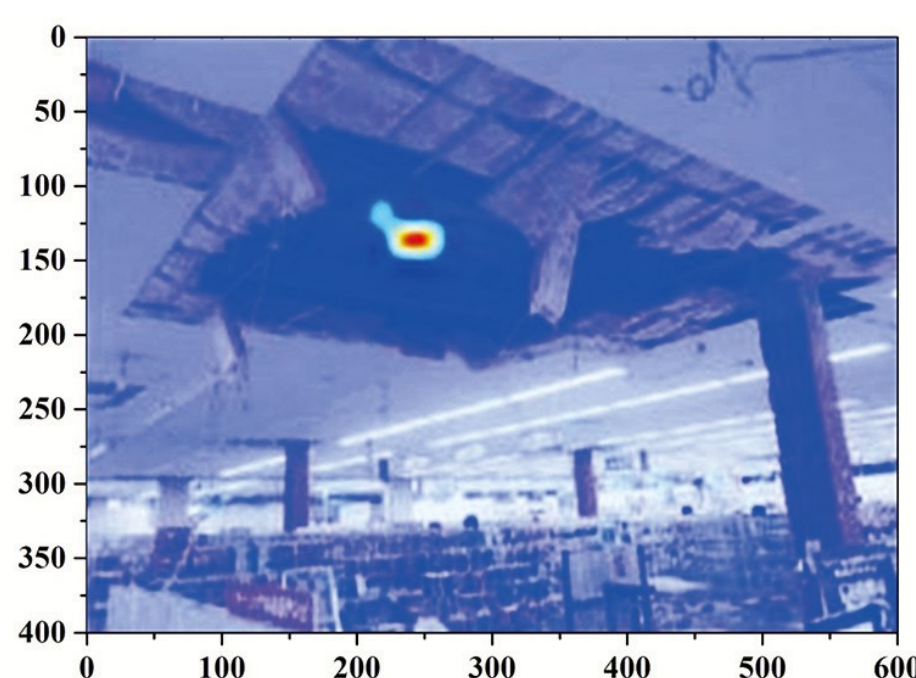
## Safety of Large Roof Buildings

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.



Great East Japan Earthquake



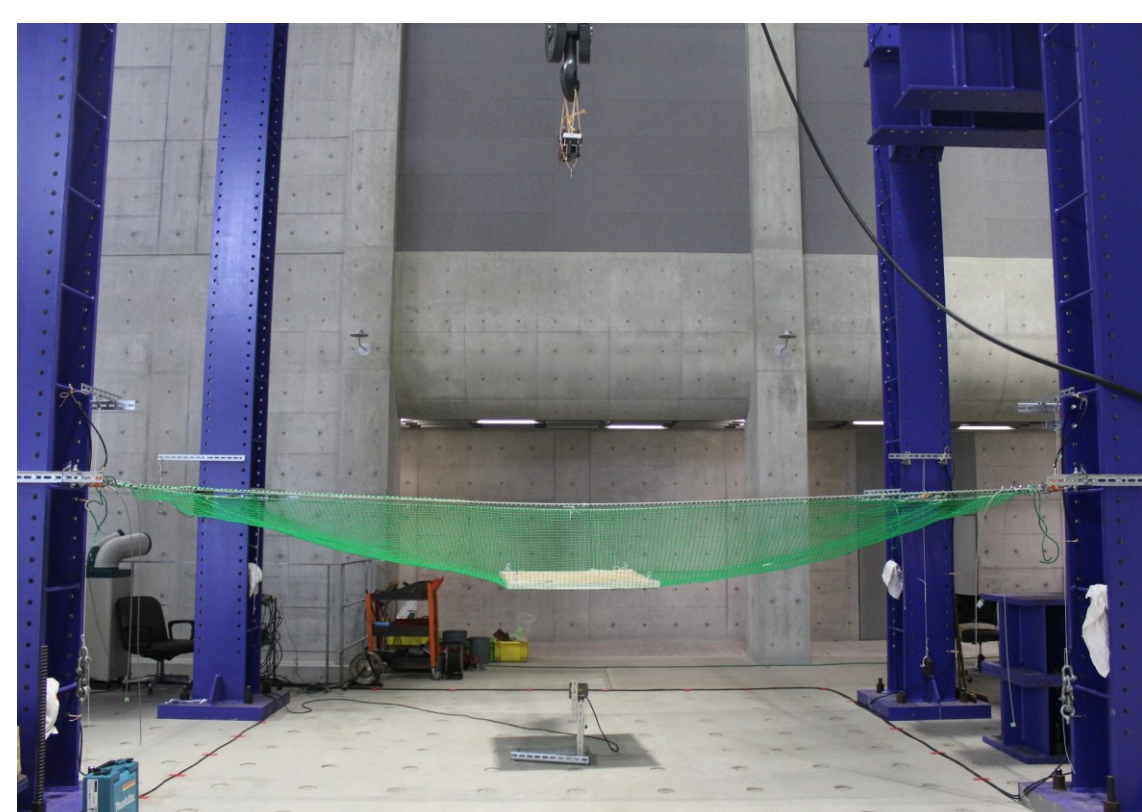
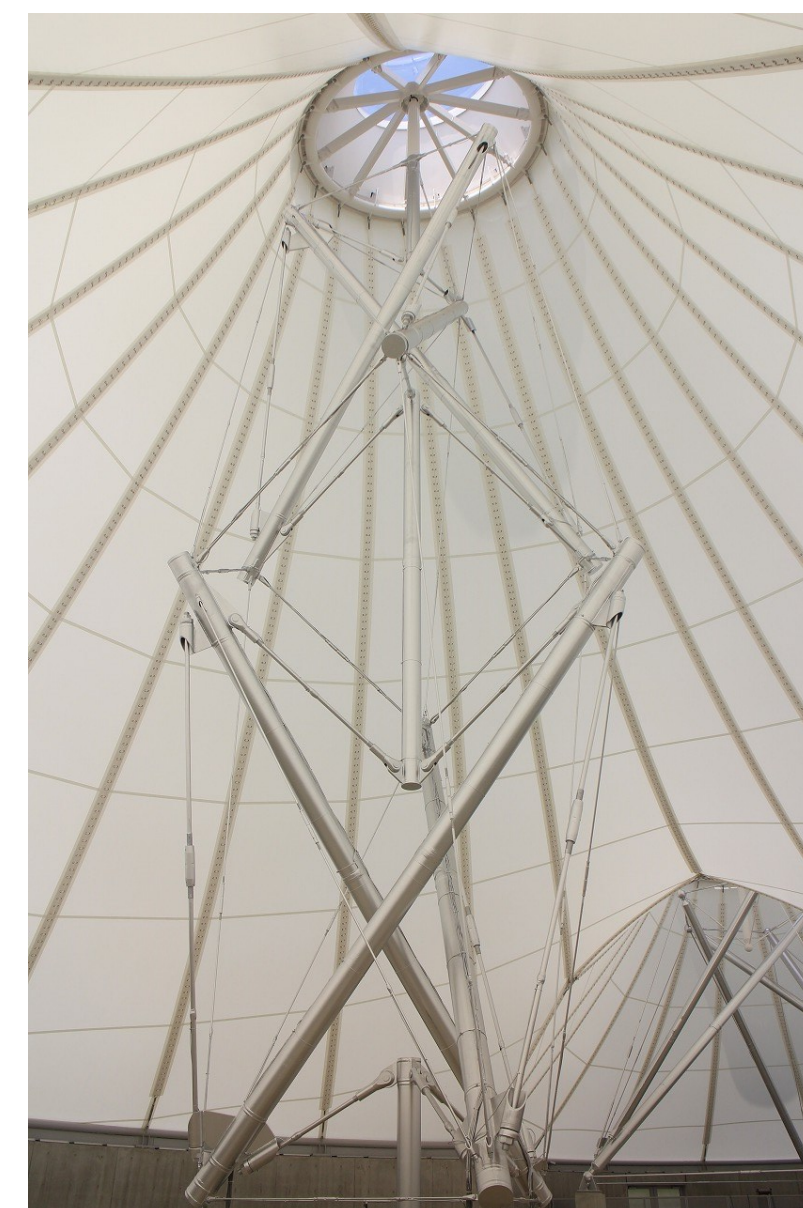
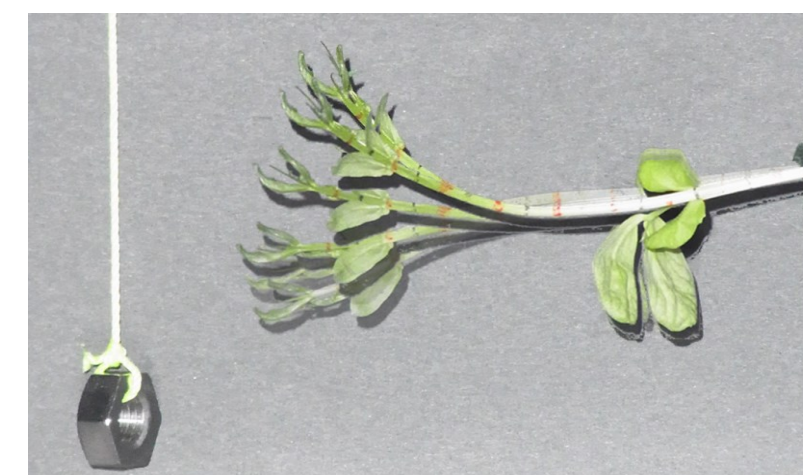
Failure Detection with AI



2016 Kumamoto Earthquake

## 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.



Real-scale tests of the safety net



Ceiling reinforcement with cables



Roof collapse due to the heavy snowfall on Feb. 14, 2014

City of Fujimi  
<http://www.city.fujimi.saitama.jp/40shisei/04gyouseizaisei/shingikai/files/tyousa-siryou4-2.pdf> (Apr. 15, 2014)

