

IMAI LAB.

[Self-build Architecture with 3D printed Joints]



Department of Human and Social Systems,
Design-Led X Platform

Architectural Space System

Department of Architecture

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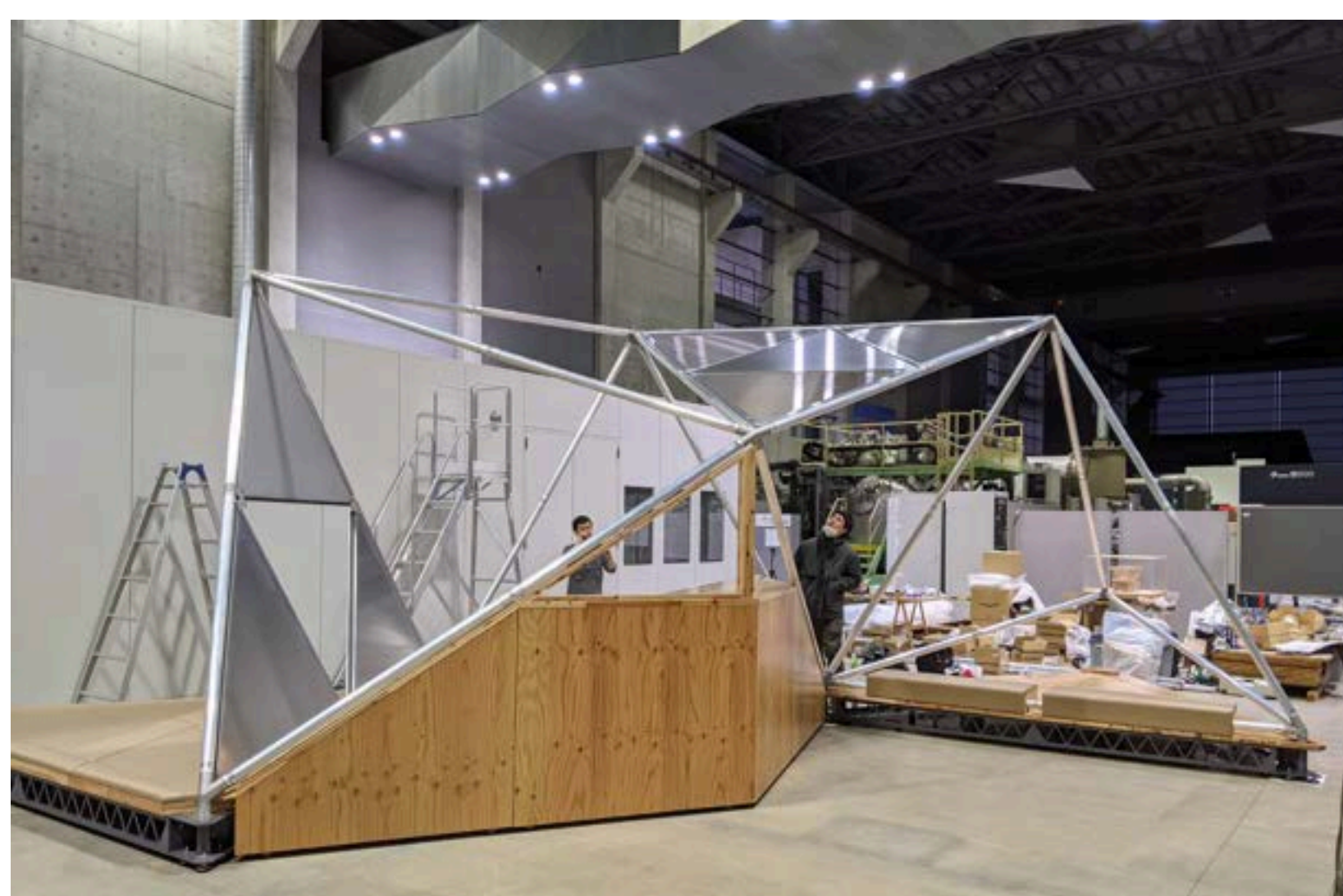
PENTA - HARD

Actual size prototype*

A prototype of future architecture, envisioning a future where 3D-printed metal joints (Additively Manufactured joints: AM joints) allow people to inexpensively build their own spaces themselves by assembling standardized parts. The easy and flexible construction method - simply insert the lightweight pipes into the joints in sequence - allows freedom to adapt the structure to suit your lifestyle and site. Based on the geometrically freely the combination of deformable pentahedrons and hexahedrons, rigid tetrahedrons and makes it possible to build with the same length of pipes, but in a variety of soft forms. By simply replacing the AM joints, the form of the space can be freely changed to suit the shape of the site, and extending or moving house

for example, when changing family members.

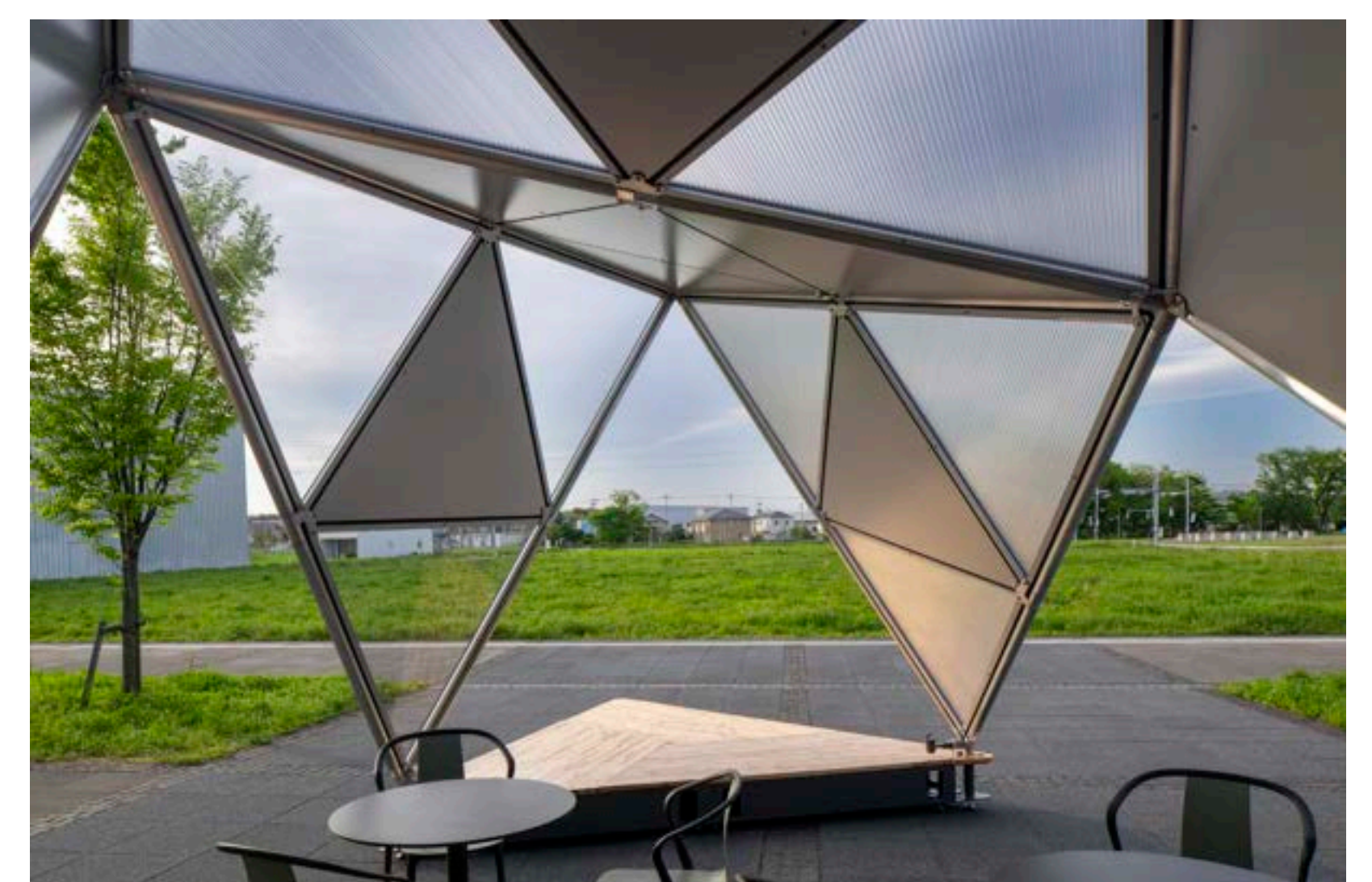
Most of the parts other than the AM joints are common components, such as aluminum pipes of the same length and equilateral triangular heat-insulating exterior panels, so there is little waste other than the joints when changing the shape. In traditional Japanese wooden construction methods, craftsmen's skills were concentrated in joints. Inheriting this concept and introducing Additive Manufacturing that can easily output complex shapes will simplify construction and enable the creation of customized spaces for different purposes.



Full-scale mock-up of self-build,
another form with other joint assemblies



AM Joints with customized outputs depending on the
specific angles at which the pipes are attached



Bright, open interior space *

*photograph (C) Yutaka Suzuki

