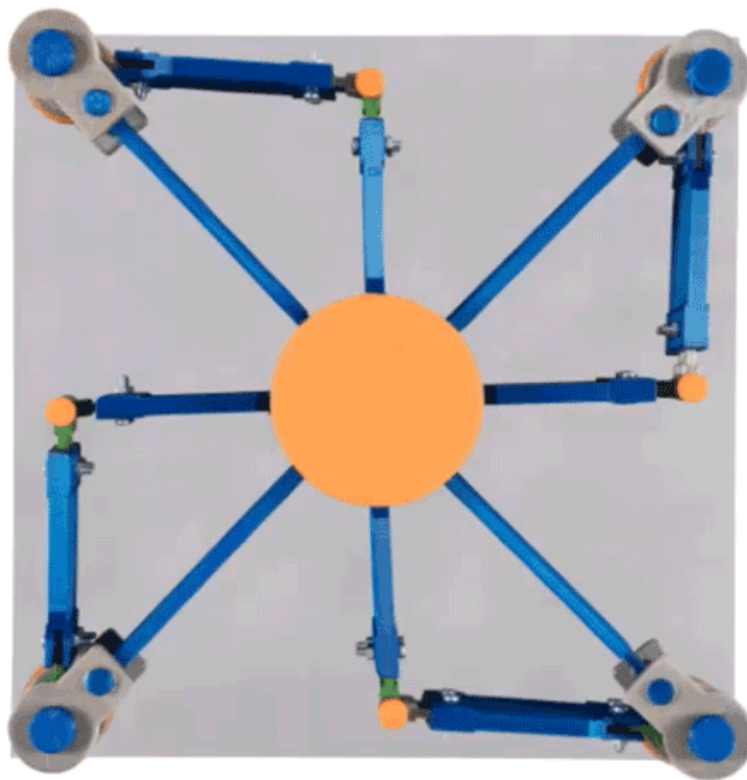


RESEARCH HIGHLIGHT | 24 November 2021

The 3D print job that keeps quake damage at bay

An easily produced seismic isolator designed to protect buildings from earthquakes mimics the bones of human limbs.



Motion animation showing the telescopic tendons in action. Credit: F. Fraternali *et al.*/*Nonlinear Dyn.* (CC BY 4.0)

A device inspired by human arms and legs could help to reduce how much a building shakes during an earthquake.

Seismic isolators are placed between a structure and its foundations to protect against shaking ground. They are already widely used, but are generally expensive and difficult to install.

Fernando Fraternali at the University of Salerno in Italy and his colleagues took a different approach. Their prototype consists of four 'limbs' with joints that connect a central post to the four corners of a plate. The post rests on a slippery circular disk called a slider and is connected to the ends of the limbs by stretchable 'tendons' made of thermoplastic polyurethane.

When the researchers moved the post from its central position, friction and the restorative nature of the tendons dampened its motion. The device, which can be built using 3D-printed components and other common tools and metallic parts, could make it easier and cheaper to protect structures from earthquakes. The tendons' size and composition can be changed, which could make them more tuneable than the rubber bearings used in many conventional seismic isolators, the scientists say.

Nature **600**, 10 (2021)

doi: <https://doi.org/10.1038/d41586-021-03506-2>

References

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