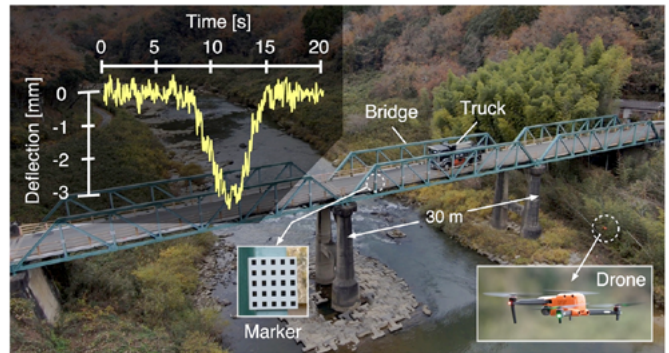


# Deflection measurement of bridges using drone aerial photography

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Social infrastructures are rapidly aging, and there are concerns about the increasing cost and effort required for maintenance and management. Deflection measurement is critical in evaluating the integrity of bridges as transportation infrastructure. The sampling moiré method was developed to accurately measure the displacement of structures by capturing the regular patterns (i.e., moiré markers) attached to the structures with a digital camera. The conventional approach is to fix a camera rigidly on a tripod or a fixed point. However, it is challenging to find a place to photograph bridges over the sea or mountains.

In recent years, drones mounted with cameras are rapidly becoming a go-to inspection technology for bridges and other transportation infrastructures. Therefore, we succeeded in developing a novel image stabilization technology and displacement measurement method that can measure the deflection of bridges by drone aerial photography. The effectiveness was verified by measuring the deflection of a 30-m-long truss bridge to detect a few millimeters displacement in the vertical direction. The newly developed measurement technology eliminates the restriction that the camera must be fixed and enables the measurement of the deflection of a more significant number of bridges.



Deflection measurement of bridges by a drone camera.