

## Nontarget-based displacement measurement using LiDAR combined with camera

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### ABSTRACT

The computer vision-based approach typically requires a target to measure structural displacement. Although the target provides the relationship between image, camera, and physical coordinates necessary for displacement calculation (Lee et al., 2020), the target installation can be often difficult in the field measurement. To overcome this limitation, the development of nontarget-based approach, which uses structural features instead of the target, is required. This research proposes a nontarget-based displacement measurement method using LiDAR and a camera. The proposed method uses the RGB and 3D point cloud information to obtain the structural displacement from the pixels in images. The experimental validation is conducted using a full-scale railway bridge.

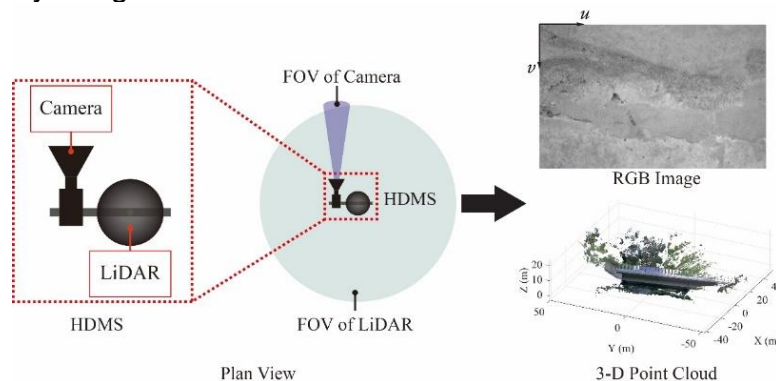


Fig. 1 LiDAR combined with camera

### REFERENCES

Lee, J., Lee, K.-C., Jeong, S., Lee, Y.-J., and Sim, S.-H. (2020), "Long-term displacement measurement of full-scale bridges using camera ego-motion compensation," *Mech. Syst. Signal Pr.*, **140**.

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