Pedestrian Suspension Bridge Monitoring using Computer Vision and Deep Learning

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ABSTRACT

System identification is a process of obtaining a model of a structural system based on a set of measurements of dynamic loads and structural responses. Oftentimes, the system identification is processed without the measurements of dynamic loads, which is known as output-only system identification. On the other hand, input-output system identification which measures both dynamic loads and responses had difficulty on measuring dynamic loads. However, recent advances in computer vision and deep learning techniques provide potential opportunity to measure dynamic load of the structural system in near real-time. This study presents a method for input-output system identification using computer vision and deep learning.

REFERENCES

Yoon, H., Elanwar, H., Choi, H., Golparvar-Fard, M., and Spencer Jr, B. F. (2016), "Target-free approach for vision-based structural system identification using consumer-grade cameras", *Structural Control and Health Monitoring*, **23**(12), 1405-1416.

Yoon, H., Hoskere, V., Park, J. W., and Spencer, B. (2017), "Cross-correlation-based structural system identification using unmanned aerial vehicles", *Sensors*, **17**(9), 2075.

Yoon, Hyungchul, Jaeho Shin, and Billie F. Spencer Jr. (2018), "Structural displacement measurement using an unmanned aerial system", *Computer-Aided Civil and Infrastructure Engineering,* **33**(3), 183-192.

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