

# Oakland University student develops new method of digital image correlation

The Oakland University and School of Engineering and Computer Science communities are invited to attend Junrui Li's defense of his Ph.D. dissertation. Seating is limited. RSVP with Katie Loodeen at loodeen@oakland.edu.

## Development of Multi-perspective Digital Image Correlation Technique and Its Applications

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**Time:** 1:00 – 3:00 p.m.  
**Date:** Thursday, March 7, 2019  
**Location:** 347 EC

Digital image correlation (DIC) is a non-contact, full field, optical measurement method, which was first proposed and developed in the 1980s. Compared with the other popular full-field optical measurement methods, such as photoelasticity, laser interferometry, fringe projection profilometry, etc., DIC has the following remarkable advantages. 1) DIC uses white light for its illumination and does not require to equip the expensive lasers. 2) DIC is insensitive to the environmental vibration and is easily applied in the applications of the on-site measurements. 3) DIC measures the full-field contour, deformation, and strain simultaneously, which provides the capability to accomplish multiple tasks using a single technique. Due to these advantages, DIC has been widely used in the industry.

The state-of-the-art 3D-DIC already plays important role in the optical metrology in the industry for decades. However, what is the next-generation DIC should be? Compared to the state-of-the-art 3D-DIC, the next-generation DIC should have one or multiple improvements in the following aspects: 1) Reduce the chance of decorrelation and the incorrect 3D reconstruction; 2) Increase the measurement area without sacrifice the resolution; 3) Extend the measurands to a higher dimension; 4) Simplify the structure and miniaturize the system. The multi-perspective DIC achieves the above-mentioned goals with different configurations and could be the next-generation DIC. Multiple different configurations of the next-generation multi-perspective DIC will be proposed in this dissertation along with their applications. The basic theory, system configurations, results analysis and applications are shown in detail in this dissertation.

