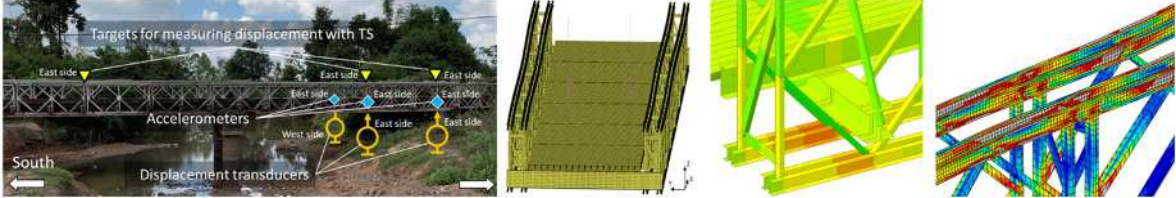
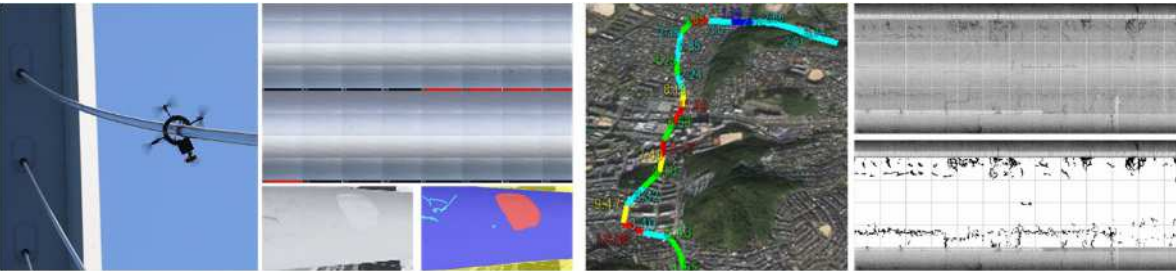


Name NISHIKAWA Takafumi	Job Title Associate Professor	Area of Expertise Structural Engineering
1. Main Research Topics ① Structural modeling for bridges based on sensing techniques We are developing a method to create analytical models for structures such as bridges efficiently and accurately. We integrate optical measurement technology, including 3D laser scanning, image analysis, and vibration sensing, with highly accurate structural identification and machine learning.  ② Identifying structural characteristics of the Bailey bridge A temporary-use bridge with prefabricated modular truss members, called a Bailey bridge, has often been used as a permanent bridge in many countries; however, there are no standards and methodologies for regular maintenance of this type of bridge. Hence, evaluating their structural soundness, such as the residual load-bearing capacity, is one of the significant challenges. This evaluation is necessary to make decisions regarding repair, reinforcement, and replacement. In this study, we are attempting to understand the structural characteristics of the Bailey bridge by conducting full-scale load testing, scale model tests, and structural analysis based on surveys.  ③ Developing sensing methods for rational inspection of structures We have developed various sensing technologies that advance structural inspections, such as image analysis for cable inspection robots on cable-supported bridges, road roughness estimation based only on the dynamic response of regular vehicles while driving, and robust and exact automatic pavement damage detection through analysis of drive records. 		
2. Keywords Social infrastructure, Structural health monitoring, system identification, image processing, bridge maintenance		
3. Remarks and Websites ① By integrating structural identification with statistical analysis, we have achieved higher accuracy. ② As modular temporary bridges are rarely used in Japan, our research is conducted in Laos, Mozambique, and other countries, in collaboration with local universities and government agencies. ③ In image analysis, we combine evolutionary computation-based filters with original techniques such as multi-resolution and autonomous tracking, enabling stable detection of nearly all visible damage. We aim to develop practical structural health monitoring that supports new approaches to infrastructure maintenance. The outcomes are expected to contribute to international cooperation projects (e.g., JICA), strengthen bridge management in developing countries, and promote local industry through the introduction of Japanese technology. researchmap: https://researchmap.jp/nishikawa1019 Laboratory: https://www.cee.nagasaki-u.ac.jp/~dokou/		