

Name MORIYAMA Toshifumi	Job Title Associate Professor	Area of Expertise Microwave Remote Sensing
1. Main Research Topics Microwaves can propagate through space regardless of day and night or weather, and have been used for radar to observe a target remotely. Radar is now used in many applications, including preventing car collisions, detecting suspicious individuals at home, and monitoring the heart rate and respiration. In this research, I consider to observe the small displacement of objects and structures and to image the objects by radar. ① Real-time monitoring of small displacement, including heartbeat and respiration of human This research focuses on a technology for radar observation of the human heartbeat and respiration in real time without contact. Another application of this technology is to measure abnormal vibrations in infrastructure (such as buildings and bridges). The following figure shows an example of measuring heartbeat and respiration. Experimental situation MIMO measurement Measured phase waveform ② Millimeter-Wave Imaging with GB-SAR In this research, I am developing technology to detect landslide and hazards by imaging using millimeter-wave ground-based synthetic aperture radar (GB-SAR). It will contribute to safety and security for human activity. The image on the right shows a millimeter-wave radar image of aluminum foil imitating a human body. アルミホイルの人体モデル 79GHz GB-SAR画像		
2. Keywords MIMO FM-CW radar, Synthetic Aperture Radar processing, Small displacement		
3. Remarks and Websites This research can non-contact real-time displacement measurement and daily fluctuations of structures such as buildings and bridges in the infrastructure and civil engineering fields, and non-contact measurement of human breathing and heartbeats in the medical field. It can also be applied in the field of security, such as detecting suspicious individuals. We would appreciate your consideration of collaborative research. researchmap: https://researchmap.jp/read0147500 Laboratory: http://www.eee.nagasaki-u.ac.jp/labs/emlab/moriyama/index.htm		