

# **Monitoring land subsidence in Choushui River Fluvial Plain by utilizing the SBAS-PS-InSAR technique**

Presenter : Thai-Vinh-Truong Nguyen

Advisor : Prof. Chuen-Fa Ni

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## **Abstract**

The Choushui River Fluvial Plain (CRFP), located in the central region of Taiwan, is known as one of the most important agricultural and aquacultural areas. The groundwater in this region has been increasingly exploited for decades to serve the exponential growth of farming, domestic, and industrial activities. The overexploitation of groundwater in CRFP consequently results in severe land subsidence. Therefore, it is necessary to monitor the subsidence in this area to understand the pattern and its relationship with relevant hydrogeological factors. Eventually, the authorities could introduce appropriate policies to mitigate land subsidence. The current monitoring networks in the study area, including GPS stations and leveling benchmarks, have sparse spatial distribution and only provide point-wise measurements. Thus, this study utilizes the PS-SBAS-InSAR technique and Sentinel-1's SAR images to monitor the recent surface deformation in the CRFP. 63 SAR images acquired from April 2017 to April 2019 have been exploited to generate 360 interferograms, which provide a huge amount of information about the subsidence process over the entire study area. Then, the interferometric phases were unwrapped along the connected network of persistent scatterers (PSs) to achieve the ground displacements. Next, the displacement value at each PS was calibrated based on the GPS measurements from nearby stations by applying the method of thin-plate splines.