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Whey-Fone Tsai is a senior research scientist in the National Center for High-performance Computing (NCHC), National Applied Research Laboratory (NARL). He is the project investigator of the multidisciplinary project, "The development of the near-real-time and 3D high-resolution



global earth observation platform for environmental and disaster monitoring," at NARL. He received his Ph.D. degree in Civil & Environmental Engineering from the University of Iowa. He had been Research Associates at Concordia University, Canada, and the University of Iowa. He was the Deputy Director of NCHC during 1998-2009. He had been participated in the US-Taiwan NSF-NSC bilateral collaboration meetings during 2002-2008 in the subject of Cyberinfrastructure development and applications to science and engineering. Also, he has been the steering committee member of the NSF-funded international organization, "Pacific Rim Application and Grid Middleware Assembly" Since 2003. Dr. Tsai's recent research interests are in the cyberinfrastructure development associated with vertical integration of sensor network, 3D GIS, and relevant cloud service.

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Challenge of Building Sensor Network and Cyberinfrastructure Pipeline for Effective Response to Natural Disaster Events

Taiwan is densely populated and situated in a highly seasonal subtropical region dominated by typhoon-generated hydrology. Due to radical climate change, serve precipitation, flood and induced inundation and landslide occur frequently beyond the expected scale during typhoon season. When this type of mega scale disaster occurs within the densely population mega city, it would be much more difficult to predict and respond in short term. This leads to significant challenges for practices in effective disaster reduction and timely support for authorities to mitigate disaster. For a quick response to natural disaster event, the near real-time remote sensing observation and image processing are very crucial to get insight into the scenario of the disaster rescue and response. Therefore, the National Applied Research Laboratory (NARL) has conducted the multidisciplinary project, "Development of near real-time, high-resolution, global earth observation 3D platform for applications to environmental monitoring and disaster mitigation." The platform encompasses Formosat-2 space borne images incorporated with data warehouse/fusion and high-performance visualization technologies, attempts to implement a near real-time and semi-automation image processing procedures, and through a platform to link with monitoring sensors, end-user disaster prevention database, analyzed model and assessment methods for supporting decision maker to prompt master the disaster scenario and assess the disaster damage. The most challenge work is to build the effective pipeline that connects with various technologies associated sensor network and cyberinfrastructure of environmental monitoring, and especially the collaborators in the loop.