



LandSAGE

Advancing Natural Disaster Monitoring, Mitigation and Management Using Networked Cyber-Infrastructure



The LandSAGE project focuses on the development and demonstration of a revolutionary approach to emergency management, by using data and visualisation-rich decision support built on networked cyber-infrastructure. To support the project, Asi@Connect provides the necessary network infrastructure to rapidly transport data and visualisations between sensors and participants. The proof-of-concept demonstration focuses on decision support when coping with natural disasters (such as landslides, mudflows, and floods) and their remediation by integrating sensor data into visualisations. These are displayed and analysed on CyberCANOE (ultra high resolution display walls) using SAGE2 software - two of the National Science Foundation's premiere data visualisation hardware and software platforms. The countries that will benefit most from this project are Vietnam, Thailand, Laos and Cambodia, where natural disasters are frequent occurrences as a result of torrential rain from seasonal monsoons.



Joining Forces Between the US, Japan, Vietnam, Thailand, Laos and Cambodia

The project involves a collaboration between leading scientists at the Laboratory for Advanced Visualization and Applications (LAVA) at the University of Hawaii at Manoa and the Information Technology Research Institute, National Institute of Advanced Industrial Science and Technology (AIST), Japan, along with scientists and students in Southeast Asian institutes. These include the Center of Multidisciplinary Integrated Technologies for Field Monitoring at the University of Engineering and Technology (FIMO) at Vietnam National University, Hanoi; Thailand's Walailak University, Mahidol University and Thammasat University; the National University of Laos; and the Institute of Technology of Cambodia.

In the Asia Pacific region, tectonic collisions between the Pacific plate and the Eurasian Continent created the Ring of Fire and a weak surface crustal formation, leading to frequent earthquakes. These quakes have created an unstable earth surface and increased levels of erosion, while the seasonal monsoons and typhoons bring torrential rain. The combined consequences of these forces are floods, landslides and mudflows, which have led both to human fatalities and to serious annual damage to infrastructure such as bridges, roads, rails, and buildings. As global environmental changes have intensified, there is also evidence of more extreme weather events occurring in the region, increasing the scale of destruction by becoming more frequent and severe. The LandSAGE project provides a unique opportunity to

improve our understanding of these events by using Asi@Connect to gather data from sensors and then visualise this information in real time. This heightened understanding allows better, more informed decision-making, enabling countries to manage these devastating events more effectively.

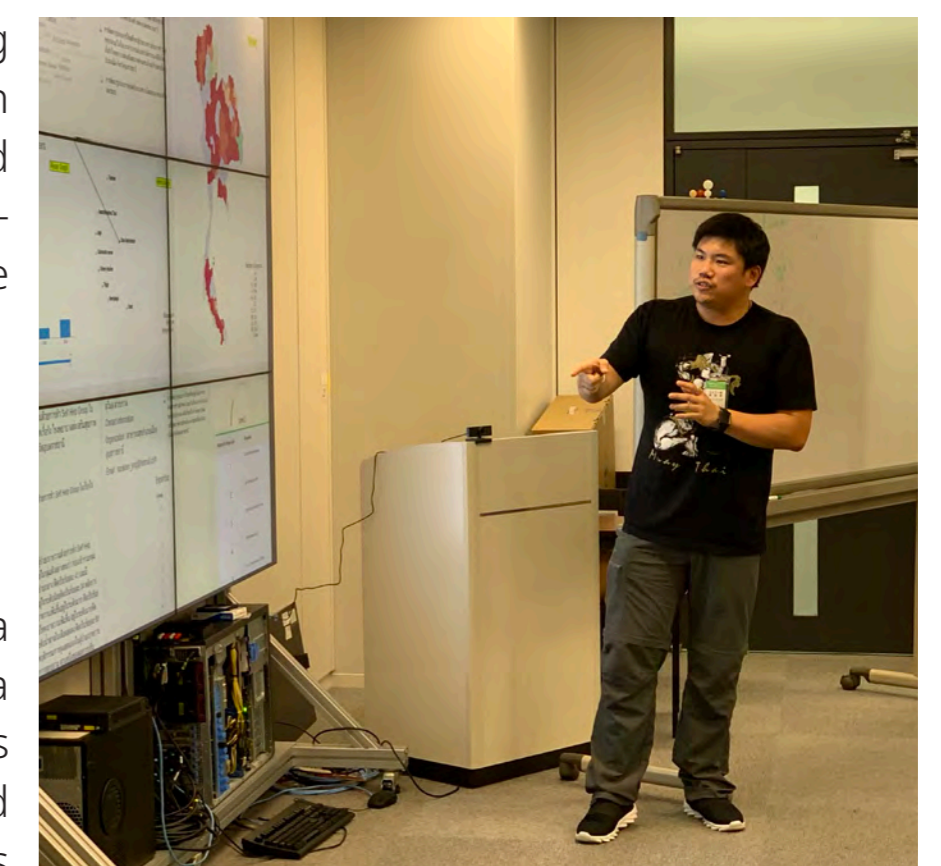
Seeing the Big Picture Through Data Visualization

Data visualisation is the process of turning data into imagery to produce insight. In the age of data intensive science and engineering, visualisation is crucial for revealing the meaning behind the data and communicating these findings to stakeholders such as policy makers and everyday citizens. This is especially valuable for researchers in Asian Pacific countries where the use of data in research, education and decision making is growing, following similar trends around the world. This effort is only possible because Asi@Connect's network has paved the way for network intensive technologies, such as the CyberCANOE. This enables teams to use these networks to transform data into insight, allowing decision makers to reach better informed conclusions more quickly and with greater confidence.

Data intensive applications are key to creating solutions to both natural and human problems, and are leading to many research successes. This approach is especially vital for conducting research on environmental topics, such as understanding and mitigating natural disasters, and climate change, which involve a range of societal responses to social and behaviour issues. This tool is therefore important for the EU Development Cooperation Instrument (DCI)-eligible countries in southeast Asia when managing potential natural disasters.

Conclusion

Thus far two training workshops have been carried out - the first at AIST, Japan, and the second at Thammasat University in Thailand, covering the construction, installation and use of CyberCANOE. Three more workshops are planned, which will focus on the design of the LandSAGE tool. For more information about the LandSAGE project, visit: www.landsage.info



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