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Multihazard Analysis of Landslides using Remote Sensing, Hydrological and Geomechanical Tools – Case Study of the 2009 Padang Earthquake

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Conventional hazard maps are often based on probabilistic approaches that deviate from physical geological and engineering principles. A case study of the massive landslides following the 2009 Padang earthquake will be demonstrated in this presentation, adopting tools using 1) remote sensing for satellite imagery, terrain and rainfall estimates, 2) hydrological techniques to demarcate locations of soil subject to high water saturation, as well as 3) geomechanical analysis considering the equilibrium of forces, ground conditions as well as slope gradient. The outcome is a more robust analysis of susceptibility to landslides as compared to probabilistic based hazard maps.

Biography:

Dr. Darren Chian Siau Chen obtained his PhD from the University of Cambridge, UK. One of his core research interests is on earthquake engineering (geomechanics and engineering geology). He was funded by the UK Engineering and Physical Sciences Research Council (EPSRC) to carry out reconnaissance missions at the 2009 Padang, 2011 Tohoku and 2016 Muisne earthquakes. Dr. Chian has attended several international conferences as keynote and distinguished speaker in 14 cities. He was interviewed by the media from Singapore, USA, UK, Denmark and India. Dr. Chian's research work on catastrophe modelling at NUS led to his award of the prestigious Top 10 Innovators Under 35 in Asia by the MIT Technology Review in 2016.