



Scalable subsurface modeling, characterization and optimal control for integrated management system

Dr. Jonghyun Harry Lee, Post-doctoral Scholar
Dept. Civil and Environmental Engineering Stanford Univ.

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Successful subsurface management projects such as managed aquifer recharge and recovery, contaminant remediation, and geologic carbon storage require multi-scale predictive flow and reactive transport modeling, accurate site characterization and uncertainty quantification, and low-cost and reliable operation planning. With recent advances in sensor technology, unprecedented large volumes of hydro-geophysical and geochemical data sets can be obtained and processed to achieve high-resolution images of subsurface properties, improve model prediction and eventually inform economic and reliable management decisions. However, incorporating a plethora of information into subsurface management has been limited by high, often prohibitive, computational costs associated with “big data” processing and numerous numerical simulations. Motivated by these challenges, this presentation will overview my ongoing works developing a flexible and scalable computation tool for integrated subsurface management. Based on my experiences in subsurface simulation, estimation, and optimization, I will also present how I can contribute to the NSF EPSCoR ‘Ike-Wai project.

