



UC Berkeley

Geosystems Engineering

Wednesday Lecture Series

Wednesday, 19 – March 2025

1:10-2:00 PM

Lecture Room: 406 Davis

GEO-INTERFACE MODELING IN THE MATERIAL POINT METHOD

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This presentation discusses large-deformation geotechnical numerical modeling with the Material Point Method (MPM) and visualization. Rather than the FEM approach of using a moving mesh to represent the material domain, the MPM uses moving Material Points, mapping back and forth to a fixed computational mesh. This creates a challenge in MPM: enforcing boundary conditions on a material domain which does not conform to the computational mesh. This research presents novel improvements to the Levelset with Barrier Method to model nonconforming geo-interfaces. The interfaces created with this method may be geometrically complex and compatible with common constitutive models. This method enables significant reduction of the computational domain, and thus computational cost. MPM model visualization is also included in this presentation, with the goal of facilitating interest in important research and effectively communicating research results.

