

CBBG3-R-TreeRootInspiredFoundation_VB

Tree Root Systems Inspire ERC's Development of Foundation and Retaining Systems

Outcome/accomplishment: Researchers from the Center for Bio-mediated and Bio-inspired Geotechnics (CBBG), an NSF-funded Engineering Research Center (ERC) at the University of California, Davis, have collaborated with researchers from the Korea Advanced Institute of Science and Technology to develop and test foundation and retaining systems inspired by tree root systems.

Impact/benefits: Root-inspired foundation solutions can potentially be used as alternatives to shallow and deep foundations that are dependent on soil compaction, which reduces water infiltration and increases flooding. The development of bio-inspired alternatives to common energy-heavy and concrete-heavy foundation methods will shift engineering practices to more closely model nature.

Explanation/background: Five NSF-funded Center researchers from the University of California, Davis, and three researchers from the Korea Advanced Institute of Science and Technology collaborated to draw on the scientific knowledge of tree root systems to develop and test a spectrum of bio-inspired prototype foundation systems. The researchers produced models of root systems of varying complexity, including 3D printed models, and performed single gravity and centrifuge tests.



3D-printed anchor models of root systems. (Photo credit: University of California, Davis)