

Special Issue on “Advancements in Geomechanics and Engineering”

Preface

We are delighted to introduce this special issue of the *Geomechanics and Engineering* journal, focused on recent **Advancements in Geomechanics and Engineering**. As a well-esteemed journal in soil mechanics and geotechnical engineering, *Geomechanics and Engineering* continues to serve as a key platform for disseminating impactful research. This special issue highlights cutting-edge methods and practical insights, ranging from foundational laboratory investigations to large-scale field applications.

This special issue stems from the success of the 2024 International Conference on Geomechanics and Engineering (ICGE24), held in Seoul, Republic of Korea. A selection of high-quality papers was invited based on their technical excellence and relevance to sustainable, forward-thinking geotechnical engineering. Each article was peer-reviewed and revised strictly to maintain high standards of originality and scholarly rigor.

Due to the high volume and quality of the accepted papers, this special issue will be published across two separate online issues of the journal. We hope this extended format enhances the accessibility and visibility of the innovative research contributions featured herein. This issue features a collection of 29 peer-reviewed articles, encompassing a diverse array of topics including:

- Dynamic properties of well-graded sand with silt
- Prediction of steel tower foundation specification using non-destructive testing method
- Subsidence characteristic of Karst sinkholes using satellite remote sensing: a Missouri case study
- Utilization of paper sludge ash in geotechnical engineering-review
- Laboratory assessment on the fragmental rocks behavior during tunnel excavation using a large-scale 2-D loading apparatus
- Numerical and experimental investigation into dynamic responses of permeable piles in liquefiable sands
- Water infiltration dynamics in bentonite-based engineering barrier systems investigation by time-lapse photography
- Shear strength of crosslinked xanthan gum biopolymer treated sand-clay mixture
- A numerical study on the effect of geobag connectors on the slope stability
- Advanced cavity detection in ground penetrating radar B-scan image using fully convolutional networks
- Sustainable soil stabilization using calcium sulfoaluminate cement and phosphogypsum
- Machine learning-based classification of underground utility counts using electrical resistance numerical module
- Enhancing bearing capacity through optimal pile group spacing and arching Effect
- Comparative analysis of pipe-cutting technologies for performance optimization within utility tunnels
- Effects of freeze-thaw cycles on the unconfined compressive strength of lime- and cement-stabilized soils
- Localized compressive strength profiling of sand MICP-treated by surface percolation method in 1D column
- Compressional behavior of fine-grained soils: clastic and biogenic silty soils
- Behavior of a poorly graded medium sand in undrained cyclic direct simple shear tests
- Inter-particle bonding mechanism in biopolymer-hydrogel stabilized granular soil: A microscopic perspective
- Unified strength prediction model for cemented soils
- Analysis on lateral resistance of precast board piles based on experimental and numerical approach

- Experimental investigation on metakaolin/coal fly ash-based porous geopolymer grouting material for geotechnical applications
- Research and application of lifting and rectifying technology for double block ballastless track structure
- Investigating rutting performance of unpaved roads with recycled concrete aggregates using small-scale cycling loading tests
- Applicability to engineered slopes of water-repellent soils using laboratory model tests
- Effect of standoff distance and abrasive particle size on abrasive waterjet drilling of hard rock: A numerical study
- Experimental study on the pullout behavior of geogrid embedded in xanthan gum biopolymer-treated sand layers
- Small-strain stiffness and deformation behavior of cation crosslinked-xanthan gum treated sand
- Prediction of resilient modulus on unsaturated geomaterials vis DEM modeling

These contributions provide important insights and contribute a vital role in advancing geomechanical and geotechnical engineering practices. We warmly thank all the authors for their valuable work and express our sincere appreciation to the reviewers for their thoughtful evaluations and dedication to maintaining academic quality.

It is our hope that this special issue becomes a valuable reference for researchers, engineers, and professionals in the field, and inspiring continued progress toward environmentally responsible and technically robust geotechnical solutions.

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