Data-Physics Driven Reduced Order Homogenization for Continuum Damage Mechanics at Multiple Scales  
Y. Yu & J. Fish

Homogenization-Based Space-Time Topology Optimization of Tunable Microstructures  
A.F. Keleş, I. Temizer, & M. Cakmakci

Computational Framework for Human Detection through Improved Ultra-Wide Band Radar System  
R. Prasanna, B.P. Prathaban, M. Jenath, S. Rajendran, & M. Ashokkumar

Multiscale Simulation of Hydrodynamic Step Bearing with Ultra-Low Clearance Involving Surface Roughness  
C. Cao & Y. Zhang

A One-Way Coupled Approach for Multiscale Characterization of Filling of Dual-Scale Fibrous Reinforcements Considering Air Compressibility and Dissolution in Lumped Fashion  
A. Benavides Arévalo, C.A. Vargas Isaza, & I.D. Patiño Arcila

SPECIAL ISSUE: MULTISCALE AND MULTIPHYSICS COMPUTATIONAL MODELING IN GEOMECHANICS PART 1  
GUEST EDITORS: KENICHI SOGA, PEI WANG, WEI SUN, & XIAOYU SONG

Preface: Multiscale and Multiphysics Computational Modeling in Geomechanics  
W. Sun, K. Soga, P. Wang, & X. Song

Complete and Semi-Complete Explicit Algorithms of a Unified Critical State Model for Over-Consolidated Soils  
X.-W. Wang, K. Cui, & R. Yuan

Mesoscale Fracture Modeling of Four-Phase Concrete Using a DEM-Enhanced Structure Generation Method  
H. Song, N. Guo, X. Chen, W. Xu, Y. Cao, & Q. Meng

Assessing Shear Strength of Silica-NASH Geopolymer Composite Using Molecular Dynamic Simulation  
K. Ji & J. Won

Calibration Method of Microscopic Parameters for Similar Material of Surrounding Rock Based on DEM  
Z. Lei, G. Wang, & Z. Yan

Microscopic Mechanisms of Particle Size Effect on 2D Arching Effect Development and Degradation in Granular Materials  
L. Liang, Y.P. Cheng, C. Xu, G. Wei, & Z. Ding

Numerical Analysis of Suffusion Behavior under Cyclic Loading with Coupled CFD-DEM Simulation  
T. Wang, P. Wang, & Z.-Y. Yin
ISSUE 3
SPECIAL ISSUE: MULTISCALE AND MULTIPHYSICS COMPUTATIONAL MODELING IN GEOMECHANICS PART 2
GUEST EDITORS: KENICHI SOGA, PEI WANG, WEI SUN, & XIAOYU SONG

Preface: Multiscale and Multiphysics Computational Modeling in Geomechanics
W. Sun, K. Soga, P. Wang, & X. Song

Effects of Cyclic Traffic Loads and Seawater Erosion on Suffusion of Crushed Calcareous Sands

Numerical Methods of Hydro-Dynamic Coupling in Saturated Soil and Its Application to Railway Engineering
K. Liu, Y. Pei, P. Zhou, B. Liu, Y. Chen, & T. Wang

Further Development of GDEM for the Modeling of Multi-Scale Dynamic Response of Rock Subjected to Blasting and Impact
J. Ma, R. Li, C. Li, J. Chen, Y. Lin, & L. Huang

Peridynamic Simulation of Fracturing in Heterogeneous Rock Based on X-Ray Diffraction and Scanning Electron Microscope Tests
H. Wang, C. Guo, W. Sun, H. Wang, X. Yang, & F. Wang

ISSUE 4
SPECIAL ISSUE: MULTISCALE MODELING OF MUSCULOSKELETAL COMPUTATIONAL BIOMECHANICS
GUEST EDITOR: SANDIPAN ROY

Preface to Special Issue: Multiscale Modeling of Musculoskeletal Computational Biomechanics
S. Roy

Intramedullary Nail or Locking Compression Plate for Fixing a Fractured Distal Tibia: Finite Element Analysis along with an Adaptation Model
A.A. Moslehi & G. Rouhi

Analyzing the Performance of Hip Cement Spacers: Investigation of Crack Behavior through a Multiscale Approach

Understanding the Biomechanical Response of Progressive Thread Dental Implants Using Multi-Scale Finite Element Analysis
A. Chakraborty, K.D. Sahare, S. Majumder, & A.R. Chowdhury

Assessment of Mechanical Responses between Trabecular Bones and Porous Scaffolds under Static Loading and Fluid Flow Conditions: A Multiscale Approach
P. Samanta, S. Kundu, A. Gupta, M. Rana, N. Mondal, & A.R. Chowdhury

A New Criterion for the Human Knee Osteoarthritis Characterization: Finite-Element Modeling
T. Zahra & B. Abdelwahed

Detailed Design and Analysis for Additive Manufacturing of Topologically Optimized and Generatively Designed Ti-6Al-4V Hip Joint Implant
A. Kishor, R.G. Burela, & A. Gupta

Multiscale Mechanobiological Modeling of the Cortical/Spongy Interface Using Finite Elements
I. Soltani, A. Barkaoui, S. Bettaibi, & S. Roy

Application of Skeletal Biomechanics to Structural Systems
S.S. Nachiar & K.S. Satyanarayanan

Corrosion Prediction of Magnesium Implant Using Multiscale Modeling Based on Machine Learning Algorithms
S. Mondal, R. Samanta, S. Shit, A. Biswas, A. Bandyopadhyay, R.S. Dhar, & G. Mandal
ISSUE 5

Fast Fourier Transform Method for Peridynamic Bar of Periodic Structure
V.A. Buryachenko

Thermodynamics Analysis of Casson Hybrid Nanofluid Flow over a Porous Riga Plate with Slip Effect

Diagnosis of Kidney Cyst, Tumor and Stone from CT Scan Images Using Feature Fusion
Hypergraph Convolutional Neural Network (F2HCN2)
N. Sasikaladevi, S. Pradeepa, A. Revathi, S. Vimal, & R. González Crespo

Computational Framework for Prediction of Cardiac Disorders byAnalyzing ECG Signals Using Machine Learning Technique
K. Ramesh, A.N. Duraivel, S. Lekshmi, S.P. Manikandan, & M. Ashokkumar

Efficient Segmentation Model Using MRI Images and Deep Learning Techniques for Multiple Sclerosis Classification
G. Langat, B. Zou, X. Kui, & K. Njagi

ISSUE 6

Effective Biomedical System for Detecting, Tracking, and Preventing Asymptomatic COVID-19 Patients Non-Invasively Using IoT and Mixed Reality
R. Prasanna, T. Ragupathi, N.G. Kumar, B.P. Prathaban, S. Aswath, & R.R. Kanna

A Comparative Biomechanical Analysis of Posterior Lumbar Interbody Fusion Constructs with Four Established Scenarios
N.K. Singh & N.K. Singh

3D Tumor Segmentation and Diagnosis System of Lung Cancer Using Multiscale Approaches
G. Langat, B. Zou, X. Kui, & K. Njagi

M.M. Dhas & N.S. Singh

Index, Volume 22, 2024
Abdelwahed, B., 57
Ashokkumar, M., 35, 47
Aswath, S., 1
Bandyopadhyay, A., 125
Barkaoui, A., 91
Benavides Arévalo, A., 61
Bettaibi, S., 91
Biswa, A., 125
Bouiadjra, B.A.B., 17
Bouziane, M.M., 17
Burela, R.G., 73
Buryachenko, V.A., 1
Cakmakci, M., 15
Cao, C., 47
Cao, Y., 27
Chakraborty, A., 31
Chen, H., 1
Chen, J., 49
Chen, Y., 27
Cheng, Y.P., 91
Chikh, B.O., 17
Chowdhury, A.R., 31, 45
Cui, K., 1
Dhar, R.S., 125
Dhas, M.M., 65
Ding, Z., 91
Duraiselv, A.N., 47
Fish, J., 1
Ghazi, A., 17
Gonzáles Crespo, R., 35
Guo, C., 67
Guo, N., 27
Gupta, A., 45, 73
Huang, L., 49
Jenath, M., 35
Ji, K., 49
Kanna, R.R., 1
Keleş, A.F., 15
Kishor, A., 73
Kui, X., 31, 61
Kumar, N.G., 1
Kundu, S., 45
Langat, G., 31, 61
Lei, Z., 65
Lekhashi, S., 47
Li, C., 49
Li, R., 49
Liang, L., 91
Lin, Y., 49
Liu, B., 27
Liu, K., 27
Ma, J., 49
Majumder, S., 31
Mandal, G., 125
Manikandan, S.P., 47
Mankour, A., 17
Meng, Q., 27
Merdji, A., 17
Mishra, S.R., 19
Mondal, N., 45
Mondal, S., 125
Moslehi, A.A., 1
Nachiar, S.S., 109
Njagia, K., 31, 61
Pandey, A.K., 19
Patiño Arcila, I.D., 61
Pattnaik, P.K., 19
Pei, Y., 27
Praadeepa, S., 35
Prasanna, R., 1, 35
Prathaban, B.P., 1, 35
Qiu, Y., 1
Ragupathi, T., 1
Rajendran, S., 35
Ramesh, K., 47
Rana, M., 45
Revathi, A., 35
Rouhi, G., 1
Roy, S., 91
Sahare, K.D., 31
Salah, H., 17
Samanta, P., 45
Samanta, R., 125
Sasikaladevi, N., 35
Satyanarayanan, K.S., 109
Shit, S., 125
Singh, N.K., 15
Singh, N.S., 65
Soga, K., v
Soltani, I., 91
Song, H., 27
Song, X., v
Sun, W., v, 67
Tang, R., 1
Temizer, İ., 15
Upreti, H., 19
Vargas Isaza, C.A., 61
Vimal, S., 35
Wang, F., 67
Wang, G., 65
Wang, H., 67
Wang, P., v, 109
Wang, T., 27, 109
Wang, X.-W., 1
Wei, G., 91
Won, J., 49
Xiong, H., 1
Xu, C., 91
Xu, W., 27
Yan, Z., 65
Yang, X., 67
Yin, Z.-Y., 1, 109
Yu, Y., 1
Yuan, R., 1
Zahra, T., 57
Zhang, R., 1
Zhang, Y., 47
Zhang, Z., 1
Zhou, P., 27
Zou, B., 31, 61
<table>
<thead>
<tr>
<th>Subject Index</th>
<th>Volume 22, 2024</th>
</tr>
</thead>
<tbody>
<tr>
<td>3D FEM, 27</td>
<td>COVID-19, 1</td>
</tr>
<tr>
<td>adaptive filter, 47</td>
<td>critical-state model, 1</td>
</tr>
<tr>
<td>additive manufacturing, 73</td>
<td>cutting-plane method, 1</td>
</tr>
<tr>
<td>adsorbed layer, 47</td>
<td>cyclic hydraulic pressure, 1</td>
</tr>
<tr>
<td>aggregate volume fraction, 27</td>
<td>damage, 91</td>
</tr>
<tr>
<td>air compressibility, 61</td>
<td>Darcy–Forchheimer flow, 19</td>
</tr>
<tr>
<td>air dissolution, 61</td>
<td>data-physics driven model reduction, 1</td>
</tr>
<tr>
<td>apparent density evolution, 91</td>
<td>deep learning, 35</td>
</tr>
<tr>
<td>arching effect, 91</td>
<td>dental implant, 31</td>
</tr>
<tr>
<td>artificial hummingbird algorithm, 65</td>
<td>discrete element method, 65</td>
</tr>
<tr>
<td>artificial neural network, 47</td>
<td>discrete element modelling, 91</td>
</tr>
<tr>
<td>ballastless track, 27</td>
<td>distal tibial fractures, 1</td>
</tr>
<tr>
<td>baseline wander, 47</td>
<td>dual-reciprocity boundary dual-scale fibrous reinforcements, 61</td>
</tr>
<tr>
<td>bearing, 47</td>
<td>dynamic responses, 27</td>
</tr>
<tr>
<td>biaxial compression test, 65</td>
<td>electrocardiogram, 47</td>
</tr>
<tr>
<td>biodegradable behavior, 125</td>
<td>element method (DR-BEM), 61</td>
</tr>
<tr>
<td>biomedical application design, 73</td>
<td>enhanced long short-term memory with attention mechanism, 31</td>
</tr>
<tr>
<td>biomedical applications, 1</td>
<td>entropy generation, 19</td>
</tr>
<tr>
<td>biomimicry, 109</td>
<td>fast Fourier transform, 1</td>
</tr>
<tr>
<td>blasting and impact, 49</td>
<td>feature fusion, 35</td>
</tr>
<tr>
<td>bone cement, 17</td>
<td>femur bone, 109</td>
</tr>
<tr>
<td>bone density distribution, 1</td>
<td>fiber reinforced composite, 1</td>
</tr>
<tr>
<td>bone remodeling theory, 1</td>
<td>field programmable gate array, 47</td>
</tr>
<tr>
<td>bone remodeling, 91</td>
<td>finite element analysis, 57, 73</td>
</tr>
<tr>
<td>bone strain, 31</td>
<td>finite element method, 1</td>
</tr>
<tr>
<td>bounding surface damage model, 49</td>
<td>finite volume method (FVM), 61</td>
</tr>
<tr>
<td>cage, 15</td>
<td>fluid–solid coupling, 27</td>
</tr>
<tr>
<td>calcareous sand, 1</td>
<td>four-phase concrete, 27</td>
</tr>
<tr>
<td>carbon footprint, 109</td>
<td>fracture, 17</td>
</tr>
<tr>
<td>cartilage degeneration, 57</td>
<td>GDEM, 49</td>
</tr>
<tr>
<td>Casson hybrid nanofluid, 19</td>
<td>generative design, 73</td>
</tr>
<tr>
<td>CFD-DEM, 1</td>
<td>graft, 15</td>
</tr>
<tr>
<td>computed tomography images, 31</td>
<td>granular materials, 91</td>
</tr>
<tr>
<td>computer-aided diagnosis, 31</td>
<td>graph convolution networks (GCNs), 35</td>
</tr>
<tr>
<td>convolutional neural network, 65</td>
<td>ground improvement, 49</td>
</tr>
<tr>
<td>corrosion, 125</td>
<td>heterogeneoue rock, 67</td>
</tr>
<tr>
<td></td>
<td>high-speed railway, 27</td>
</tr>
<tr>
<td></td>
<td>hip implant, 73</td>
</tr>
<tr>
<td></td>
<td>hip spacer, 17</td>
</tr>
<tr>
<td></td>
<td>homogenization, 1, 15</td>
</tr>
<tr>
<td></td>
<td>human detection, 35</td>
</tr>
<tr>
<td></td>
<td>humerus bone, 109</td>
</tr>
<tr>
<td></td>
<td>hybrid and dilated convolution-based adaptive residual attention network, 61</td>
</tr>
<tr>
<td></td>
<td>hydro-dynamic coupling, 27</td>
</tr>
<tr>
<td></td>
<td>hydrodynamics, 47</td>
</tr>
<tr>
<td></td>
<td>hypergraph learning, 35</td>
</tr>
<tr>
<td></td>
<td>image segmentation, 61</td>
</tr>
<tr>
<td></td>
<td>implant stress, 31</td>
</tr>
<tr>
<td></td>
<td>improved ReLU, 65</td>
</tr>
<tr>
<td></td>
<td>inhomogeneous material, 1</td>
</tr>
<tr>
<td></td>
<td>intramedullary nailing, 1</td>
</tr>
<tr>
<td></td>
<td>IoT, 1</td>
</tr>
<tr>
<td></td>
<td>kidney diseases, 35</td>
</tr>
<tr>
<td></td>
<td>knee laxity, 57</td>
</tr>
<tr>
<td></td>
<td>laser powder bed fusion, 73</td>
</tr>
<tr>
<td></td>
<td>liquid composite molding, 61</td>
</tr>
<tr>
<td></td>
<td>load, 47</td>
</tr>
<tr>
<td></td>
<td>lumbar fusion, 15</td>
</tr>
<tr>
<td></td>
<td>lung cancer, 31</td>
</tr>
<tr>
<td></td>
<td>machine learning techniques, 125</td>
</tr>
<tr>
<td></td>
<td>macroscopic filling, 61</td>
</tr>
<tr>
<td></td>
<td>marine predators algorithm, 65</td>
</tr>
<tr>
<td></td>
<td>mechanical signal, 91</td>
</tr>
<tr>
<td></td>
<td>mechanisms, 91</td>
</tr>
<tr>
<td></td>
<td>mesoscopic filling, 61</td>
</tr>
<tr>
<td></td>
<td>Mg implant, 125</td>
</tr>
</tbody>
</table>
micro finite element analysis, 31
micro-parameter calibration, 65
microscopic, 1
microstrip, 35
MobileNetV3, 65
modeling, 125
modified fluctuation-based queuing search algorithm, 31
molecular dynamics, 49
MR, 1
multi-cascaded model, 31
multiple sclerosis classification, 61
multi-scale 3D TransUNet, 31
multi-scale adaptive TransResUNet++, 61
multiscale damage modeling, 1
multi-scale dynamic response, 49
multiscale modeling, 1
NASH geopolymer, 49
non-dominated sorting genetic algorithm II, 73
numerical integration, 1
OA classification, 57
one-way coupled multiphase simulations, 61
optimization, 65
osteoarthritis, 57
over-consolidation, 1
particle size effect, 91
peridynamics, 1, 67
periodic microstructures, 1
permeability, 45
plating, 1
PLIF, 15
porosity and pore size, 27
porosity, 45
porous media, 45
porous medium, 19
positioning, 35
pressure, 47
programmable composites, 15
quarantine, 1
random opposition of cicada swarm optimization, 61
reinforcement, 17
remodeling finite-element method, 91
representational learning, 35
Riga plate, 19
rod, 15
saturated roadbed, 27
scanning electron microscope (SEM), 67
screw, 15
sensors, 1
shear strength, 49
silica-geopolymer composite, 49
similar materials, 65
smart materials, 15
soft bond model, 65
solid isotropic material penalization, 73
space–time topology optimization, 15
static structure, 45
stress analysis, 109
stress and deformation, 45
structural element, 109
strut member, 109
sub-loading surface, 1
sub-stepping method, 1
suffusion, 1
surface roughness, 47
the DEM packing method with periodic boundary, 27
the rigid block discrete element method, 27
thread depth, 31
tie member, 109
topology optimization, 73
tri-band, 35
tunable microstructures, 15
UWB antenna, 35
UWB radar, 35
velocity slip, 19
volume of fluid method (VOF), 61
von Mises stress, 1
wall shear stress, 45
X-FEM, 17
X-ray diffraction (XRD), 67