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Nota di contenuto	Advances in High-Performance Computational Earth Sciences: Numerical Methods, Frameworks & Applications -- Large-scale Nonlinear Viscoelastic Simulation for Crustal Deformation Accelerated by Data-driven Method and Multi-grid Solver -- Artificial Intelligence Approaches for Network Analysis -- Informing the Neural Network Activation Function with Graph Centrality Measures: The Case Study of Oscillating Chemical Reaction Simulation -- A Novel Routing Algorithm for Optical Networks Based on ML Methods -- Decision Trees and Machine Learning for Cybersecurity: How Model Settings Affect Attack Detection -- Covering the Online Spectrum of Opinion in Social

Context: The Benefit of Network Node Sampling Through an Italian Case Study -- A Multilayer and Temporal Network for Studying the Connections of Cross-listed Stocks -- A Machine Learning-based Framework for Predicting Candidate Drug Side Effects from Biological Networks -- Artificial Intelligence and High-Performance Computing for Advanced Simulations -- Introducing B-spline Basis Functions in Neural Network Approximations -- Augmenting Petrov-Galerkin Method with Optimal Test Functions by DNN Learning the Inverse of the Gram Matrix -- EXPBrain: Exponential Integrators for Glioblastoma Brain Tumor Simulations -- Influence of Mixed Precision on Performance and Accuracy of DNN Training for AI-Accelerated CFD Simulations on NVIDIA Multi-GPU System -- Performance-energy Investigation of Selected Applications using a Parallel Multi-GPU Genetic Algorithm under Power Capping -- Discrete Residual Loss Functions for Training Physics-Informed Neural Networks -- Uncertainty-Aware Well Placement: Simulator-Verified Dual-Network Reinforcement Learning Approach meets Particle Filters -- Sequential, Parallel and Consecutive Hybrid Evolutionary-swarm Optimization Metaheuristics -- Graph Grammar Model for h-adaptation for Meshes with Quadrilateral, Pentagon, and Hexagon Elements -- MinRNNs for Lagrangian-Based Simulations of Transient Flow Problems -- Socio-cognitive Agent-oriented Evolutionary Algorithm with Trust-based Optimization -- Structural Limiting Range of Perception in PSO -- Towards Novel Migration Topologies for Parallel Evolutionary Algorithms -- Biomedical and Bioinformatics Challenges for Computer Science -- From the Synaptome to the Connectome: Data Bigness Estimation for the Human Connectome at the Nanoscale -- Enzyme Stability Prediction: Advancing with Ensemble Machine Learning and Explainable Artificial Intelligence -- MTL-FECAM: Bridging the stability-plasticity tradeoff in Exemplar-free Continual Learning -- Development of a pH-Responsive Bio-robotics for Targeted Drug Delivery to Lung Cancer in the Vascular System -- Accelerating Super-Resolution Magnetic Resonance Imaging Using Toeplitz k-Space Matrices and Deep Learning Reconstruction -- Logistic Regression with Covariate Clustering in Genome-wide Association Interaction Studies -- Predicting Antibody Responses to Type V GBS-TT Conjugate Vaccine Using Computational Modelling -- A Computational Immune Approach for Modeling Different Levels of Severity in COVID-19 Infections -- Implementation of Convolutional Neural Networks for the Purpose of Five Types of White Blood Cells Automatic Counting -- BioSkel - Towards a Framework for OMICS Applications -- Uncertainty Quantification of Thermal Damage in Hyperthermia as a Cancer Therapy -- Bias in Dermatological Datasets: A Critical Analysis of the Underrepresentation of Dark Skin Tones in Melanoma Classification Images.

Sommario/riassunto

The 6-volume set constitutes the workshop proceedings of the 25th International Conference on Computational Science, ICCS 2025, which took place in Singapore, Singapore, during July 7–9, 2025. The 137 full papers and 32 short papers presented in these proceedings were carefully reviewed and selected from 322 submissions. The papers are organized in the following topical sections: Volume I: Advances in high-performance computational earth sciences: numerical methods, frameworks & applications; artificial intelligence approaches for network analysis; artificial intelligence and high-performance computing for advanced simulations; and biomedical and bioinformatics challenges for computer science. Volume II: Computational health; computational modeling and artificial intelligence for social systems; and computational optimization,

modelling and simulation. Volume III: Computational science and AI for addressing complex and dynamic societal challenges equitably; computer graphics, image processing and artificial intelligence; computing and data science for materials discovery and design; and large language models and intelligent decision-making within the digital economy. Volume IV: Machine learning and data assimilation for dynamical systems; and multi-criteria decision-making: methods, applications, and innovations. Volume V: (Credible) Multiscale modelling and simulation; numerical algorithms and computer arithmetic for computational science; quantum computing; retrieval-augmented generation; and simulations of flow and transport: modeling, algorithms and computation. Volume VI: Smart systems: bringing together computer vision, sensor networks and artificial intelligence; solving problems with uncertainty; and teaching computational science.