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Nota di contenuto	Artificial Intelligence Background, Applications and Future -- Buckling Resistance Prediction of High Strength Steel Columns Using Metaheuristic Trained Artificial Neural Networks -- The Use of Artificial Neural Networks and Metaheuristic Algorithms to Optimize the Compressive Strength of Concrete -- Design of Double Layer Grids Using Backpropagation Neural Networks -- Analysis of Double Layer Barrel Vaults Using Different Neural Networks -- BP and RBF Neural Networks for Predicting Displacements and Design of Schwedler dome -- Structural Optimization by Gradient Based Neural Networks -- Comparative Study of Backpropagation and Improved Counter propagation Neural Nets in Structural Analysis and Optimization -- Hybrid ECBO ANN Algorithm for Shear Strength of Partially Grouted Masonry Walls -- Shape Optimization of Arch Dams with Frequency Constraints by Enhanced Charged System Search Algorithm and Neural Network -- Estimation of the Vulnerability of the Concrete Structures Using Artificial Neural Networks -- Efficient Training of Artificial Neural Networks Using Different Meta heuristic Algorithms for Predicting the FRP Strength -- A Metaheuristic Based Artificial Neural Network for Plastic Limit Analysis of Frames -- Wavefront Reduction Using Graphs,

Neural Networks and Genetic Algorithm -- Optimal Design of Transmission Towers Using Genetic Algorithm and Neural Networks -- Stimulating the Vulnerability of the Concrete Moment Resisting Frame Structures Using Artificial Neural Networks -- A Hybrid Graph Neural Method for Domain Decomposition -- GMDH based Prediction of Shear Strength of FRP RC Beams With and Without Stirrups -- Efficient Training of Two ANNs Using Four Meta-heuristic Algorithms for Predicting the FRP Strength -- New Predictive Models for Prediction of Bond Strength Between FRP Reinforcements Externally Glued on Masonry Units -- Kernel Extreme Learning Machine Application in Prediction of Bond Strength Between EBR FRP and Concrete Substrate -- Development of Predictive Models for Shear Strength of HSC Slender Beams Without Web Reinforcement Using Machine Learning Based Techniques.

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#### Sommario/riassunto

This book provides different applications of artificial neural networks (ANN) and machine learning (ML) in various problems of material science, structural optimization, and optimal analysis of structures in twenty two chapters. Nowadays, the world has witnessed unprecedented advances in technology and computer science. Artificial intelligence has emerged as a top field captivating global attention. Often referred to as AI, this technology stands apart from other disciplines as it aims to design machines and systems that exhibit intelligence, learn autonomously, and make decisions akin to humans. In order to comprehend the impact of this innovation, one must delve into the workings of artificial intelligence, trace its historical evolution from inception to the present day, and explore its diverse applications in domains like medicine, transportation, broadcasting, and marketing. Artificial intelligence introduces a transformative element to our reality, fostering significant breakthroughs and innovations. The book is used in any AI course, in particular, in Civil Engineering. It is also utilized in various fields of Industrial Civil Engineering.

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