

1. Record Nr.	UNINA9910337629803321
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Titolo	Peridynamic Differential Operator for Numerical Analysis // by Erdogan Madenci, Atila Barut, Mehmet Dorduncu
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2019
ISBN	9783030026479 3030026477
Edizione	[1st ed. 2019.]
Descrizione fisica	1 online resource (XI, 282 p. 163 illus., 137 illus. in color.)
Disciplina	515.7242
Soggetti	Mechanics Mechanics, Applied Materials science Computer science - Mathematics Solid Mechanics Characterization and Evaluation of Materials Computational Science and Engineering
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	1 Introduction -- 2 Peridynamic Differential Operator -- 3 Numerical Implementation -- 4 Interpolation, Regression and Smoothing -- 5 Ordinary Differential Equations -- 6 Partial Differential Equations -- 7 Coupled Field Equations -- 8 Integro-Differential Equations -- 9 Weak Form of Peridynamics -- 10 Peridynamic Least Squares Minimization. .
Sommario/riassunto	This book introduces the peridynamic (PD) differential operator, which enables the nonlocal form of local differentiation. PD is a bridge between differentiation and integration. It provides the computational solution of complex field equations and evaluation of derivatives of smooth or scattered data in the presence of discontinuities. PD also serves as a natural filter to smooth noisy data and to recover missing data. This book starts with an overview of the PD concept, the derivation of the PD differential operator, its numerical implementation for the spatial and temporal derivatives, and the description of sources of error. The applications concern interpolation, regression, and

smoothing of data, solutions to nonlinear ordinary differential equations, single- and multi-field partial differential equations and integro-differential equations. It describes the derivation of the weak form of PD Poisson's and Navier's equations for direct imposition of essential and natural boundary conditions. It also presents an alternative approach for the PD differential operator based on the least squares minimization. Peridynamic Differential Operator for Numerical Analysis is suitable for both advanced-level student and researchers, demonstrating how to construct solutions to all of the applications. Provided as supplementary material, solution algorithms for a set of selected applications are available for more details in the numerical implementation.

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