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| Autore | Nguyen-Schäfer Hung |
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| Soggetti | Machinery Engines Vibration Dynamics Engineering mathematics Machinery and Machine Elements Engine Technology Vibration, Dynamical Systems, Control Engineering Mathematics |
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| Nota di contenuto | Tapered Roller Bearings -- Cylinder Roller Bearings -- Loads Acting on Gears and Bearings -- Bearing Endplay over Operating Temperatures -- Accelerated Load Spectrum -- Solving Nonlinear Equation Systems. |
| Sommario/riassunto | This monograph presents computational models that describe electro-mechanical characteristics of tapered and cylinder roller bearings in various industrial applications. Applying the Levenberg-Marquardt's algorithm to solving strongly nonlinear coupled equation systems, the computational models consisting of many circular slices per rolling element enable computations of the local Hertzian pressures at the elastohydrodynamic (EHD) contact area, the relating oil-film thickness in elastohydrodynamic lubrication (EHL), the limiting voltage of electro-pitting, bearing frictions, and fatigue lifetimes of the bearings for various load spectra. Using the best-known machine-learning method for clustering, the load spectrum is clustered in k cluster means based |

on the invariant damage number to accelerate the load spectrum. Furthermore, the accelerated load spectrum is used for the testing procedure of the bearings to reduce the testing time and costs as well. The target audience of this book primarily comprises graduate students in mechanical engineering and practicing engineers of electro-machines and transmission systems who want to computationally design tapered and cylinder roller bearings for the automotive industry and other industries, and to deeply dive into these relating working fields.
