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   Autore             Breda Dimitri

   Titolo             Stability of Linear Delay Differential Equations : A Numerical Approach
                      with MATLAB / / by Dimitri Breda, Stefano Maset, Rossana Vermiglio

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   Descrizione fisica  1 online resource (162 p.)

   Collana            SpringerBriefs in Control, Automation and Robotics, , 2192-6794

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   Soggetti           System theory
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   Lingua di pubblicazione  Inglese

   Formato            Materiale a stampa

   Livello bibliografico  Monografia

   Note generali      Description based upon print version of record.

   Nota di bibliografia  Includes bibliographical references.

   Nota di contenuto  Introduction -- Part I: Theory -- Notation and basics -- Stability of
                      linear autonomous equations -- Stability of linear periodic equations --
                      Part II: Numerical Analysis -- The infinitesimal generator approach --
                      The solution operator approach -- Part III: Implementation and
                      applications -- MATLAB implementation -- Applications.

   Sommario/riassunto  This book presents the authors' recent work on the numerical methods
                      for the stability analysis of linear autonomous and periodic delay
                      differential equations, which consist in applying pseudospectral
                      techniques to discretize either the solution operator or the infinitesimal
                      generator and in using the eigenvalues of the resulting matrices to
                      approximate the exact spectra. The purpose of the book is to provide a
                      complete and self-contained treatment, which includes the basic
                      underlying mathematics and numerics, examples from population

dynamics and engineering applications, and Matlab programs implementing the proposed numerical methods. A number of proofs is given to furnish a solid foundation, but the emphasis is on the (unifying) idea of the pseudospectral technique for the stability analysis of DDEs. It is aimed at advanced students and researchers in applied mathematics, in dynamical systems and in various fields of science and engineering, concerned with delay systems. A relevant feature of the book is that it also provides the Matlab codes to encourage the readers to experience the practical aspects. They could use the codes to test the theory and to analyze the performances of the methods on the given examples. Moreover, they could easily modify them to tackle the numerical stability analysis of their own delay models.