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Differential-Algebraic Equations Forum

The series “Differential-Algebraic Equations Forum” is concerned with analytical, algebraic, control theoretic and numerical aspects of differential algebraic equations (DAEs) as well as their applications in science and engineering. It is aimed to contain survey and mathematically rigorous articles, research monographs and textbooks. Proposals are assigned to an Associate Editor, who recommends publication on the basis of a detailed and careful evaluation by at least two referees. The appraisals will be based on the substance and quality of the exposition.

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Editors

Surveys in Differential-Algebraic Equations IV

 Springer

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Preface

We are pleased to present the fourth volume of survey articles in various fields of differential-algebraic equations (DAEs).

In the present volume we again extend the list of survey articles in the sense that they are of theoretical interest and equally relevant to applications.

The chapter “On the History of Differential-Algebraic Equations: A Retrospective with Personal Side Trips” gives an overview of the timeline and achievements on theory and practice of differential-algebraic equations in the past few decades. In “DAE Aspects of Multibody System Dynamics”, the contributions of DAE theory and numerical analysis for modelling and simulation of systems in mechanical multibody dynamics are highlighted. In “Model Reduction for DAEs: A Survey”, the state of the art in approximation of large-scale DAEs by low-dimensional ones is presented. The chapter “Observability of Linear Differential-Algebraic Systems: A Survey” treats observability for linear time-invariant DAEs. The fifth chapter is a survey of numerical methods for DAEs.

We hope that this issue will contribute to complete the picture of the latest developments in DAEs. The collection of survey articles may also indicate that differential-algebraic equations are now an established field in applied mathematics.

Ilmenau, Germany
Hamburg, Germany
August 2016

Achim Ilchmann
Timo Reis

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