Preface

Tamas Insperger · Gabor Stepan

The significance of using delay-differential equations (DDEs) in modelling different dynamic phenomena is shown by the high number of delay-related papers submitted to *International Journal of Dynamics and Control* in the recent months. These articles were organized into two thematic issues. In the previous issue, 10 papers were collected related to time-delay systems with different contexts such as feedback control in networks, stability predictions for machining operations, vibration suppression via delayed absorber, delayed control of continuum beams, and optimization algorithms for sampled-data control systems with delay. In the current issue, 9 articles are presented, each deals with different concepts and techniques related to the stability analysis of DDEs.

Stability analysis of time-delay systems is a challenging tasks due to the infinite-dimensional nature of the corresponding DDE. Although time delays are usually associated with destabilization of dynamical systems, they can also improve stability properties for certain parameter combinations. Local behaviour of time-delay systems therefore often shows an intricate picture in the space of system parameters. The need to analyse local behaviour of DDEs as function of system parameters has motivated the development of different analytical and numerical techniques in the recent years. In the current thematic issue, the topics include spectral approximations techniques, nonlinear eigenvalue problems, pseudospectral methods, Mikhailov-type stability criteria, stability crossing sets, delay-margin design, Chebyshev spectral continuous time approximation, stability analysis by Galerkin projections and spectrum design using distributed delay.

Guest Editors of the Thematic Issue
Tamas Insperger
Gabor Stepan

T. Insperger (✉) · G. Stepan
Budapest University of Technology and Economics, Budapest, Hungary
e-mail: insperger@mm.bme.hu