

# 2006 年度 第 1 回 システム制御セミナー

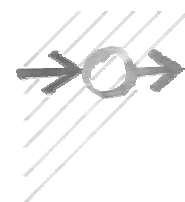


## From Lyapunov Stability Theory to New Computational Algorithms

**Prof. Dr.-Ing. Bernd Tibken**



Automatic Control  
Faculty of Electrical, Information and  
Media Engineering  
University of Wuppertal



講演日時：平成 18 年 7 月 29 日 (土) 11:00 ~ 12:00 (2B716 にて)

### 概要：

In this talk the central results from Lyapunov Stability Theory are reviewed and new computational methods for a constructive approach will be presented. In the past the test of a system for asymptotic stability has very often been carried out by selecting an appropriate quadratic Lyapunov function and the use of sometimes rough estimates in order to ensure the negativity of the derivative of the Lyapunov function along the trajectories of the nonlinear dynamical system under consideration. These methods will be reviewed and some limitations of this approach will be shown for simple examples. In the following the talk will focus on the computational problems involved, e.g., the definiteness test for functions and the estimation of the region of attraction of an asymptotically stable stationary point of the nonlinear system. I will present also an introduction into modern developments involving semidefinite programming (SDP) approaches and new decompositions of polynomials as sums of squares (SOS). The talk will end with a conclusion and an outlook.

### 講師紹介：

Prof. Dr.-Ing. Bernd Tibken graduated in Physics from the University of Hamburg in 1985 and received the PhD degree from the Technical University of Hamburg-Harburg and the Habilitation degree from the University of Ulm in 1990 and 1996, respectively. Since 1999 he is Full Professor for Automatic Control in the Faculty of Electrical, Information, and Media Engineering (Faculty E) of the University of Wuppertal. Since 2002 he is Dean of Faculty E at the University of Wuppertal. He is member of numerous scientific societies and has directed several funded research programs in the area of automatic control, software engineering and automotive systems. His list of publications include over 100 refereed articles in scientific journals and IEEE conference proceedings.



問い合わせ：滑川 徹

TEL : 076-234-4848 Mail : toru@t.kanazawa-u.ac.jp

URL : <http://www-scl.ec.t.kanazawa-u.ac.jp/>

