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★**Linear parameter-varying and time-delay systems.**

Analysis, observation, filtering & control.
Advances in Delays and Dynamics, 3.
Springer, Heidelberg, 2015. *xxvi*+394 *pp.* *ISBN* 978-3-662-44049-0; 978-3-662-44050-6

This book is a self-contained monograph that provides a large collection of results on linear parameter-varying (LPV) systems. The book is of interest to mathematicians and engineers working on LPV systems and/or time-delay control systems.

The book is divided into three parts. The first part is devoted to LPV systems described by ordinary differential equations (delay-free systems). The second part deals with the basic qualitative theory of time-delay systems. Finally, the third part provides results on LPV time-delay systems.

The first part of the book, on LPV delay-free systems, contains three chapters. The first chapter is an introduction to LPV systems, while the second chapter provides numerous sufficient conditions for various stability notions of LPV systems. The third chapter introduces the reader to techniques for the design of stabilizing feedback laws for LPV systems: gain-scheduling, quadratic stabilization and linear matrix inequalities (LMIs).

The second part of the book has two chapters. Chapter 4 is an introduction to time-delay systems, while Chapter 5 contains all basic results and tools in stability theory of time-delay systems: Lyapunov-Krasovskiĭ functionals and Razumikhin results.

The third part of the book, on LPV time-delay systems, contains three chapters. Chapter 6 is an introduction to LPV time-delay systems. Specific results for the observer design problem for LPV time-delay systems are given in Chapter 7. Chapter 8 presents results on the solution of the feedback stabilization problem for LPV time-delay systems by means of state or output feedback controllers.

Almost all results of the book are proved in detail but there are some results whose proofs are omitted. The book contains a very helpful appendix with many technical results on LMIs and linear algebra.

The advantage of the book is that it requires only a basic knowledge of linear algebra, dynamical systems and mathematical control theory. *Iasson Karafyllis*