NATIONAL ACADEMY OF SCIENCES OF UKRAINE
INSTITUTE OF MATHEMATICS

A. G. MAZKO

MATRIX METHODS FOR THE ANALYSIS AND SYNTHESIS OF DYNAMICAL SYSTEMS

PROJECT
«SCIENTIFIC BOOK»

KYIV NAUKOVA DUMKA 2023

Contents

A. G. Mazko. Matrix methods for the analysis and synthesis of dynamical systems. Kyiv: Naukova dumka, 2023, 320 p. [Ukrainian].

ISBN 978-966-00-1892-1

https://doi.org/10.37863/6103136622-55

The book outlines constructive methods for the analysis and synthesis of dynamical systems based on the application of matrix equations and inequalities. The generalizations of the Lyapunov equation are presented in the framework of stability and spectrum localization theory of linear systems. Classical methods for motion stability analysis, modern methods for robust stabilization and optimization of dynamical systems, as well as new approaches to solving generalized H_∞-control problems for continuous and discrete time systems with controllable and observable outputs are presented. Algorithms for estimating and minimizing the weighted damping level of bounded perturbations in standard and descriptor control systems are proposed. The stability theory of positive and monotone dynamical systems is developed.

The book is intended for scientists, engineers, PhD students and senior students of the corresponding specialties.