1. Record Nr. UNINA9910784363603321 Autore Wescott Tim Titolo Applied control theory for embedded systems [[electronic resource] /] / by Tim Wescott Pubbl/distr/stampa Burlington, MA,: Newnes, c2006 **ISBN** 1-281-05213-2 9786611052133 0-08-047589-2 Edizione [1st edition] Descrizione fisica 1 online resource (321 p.) Embedded technology series Collana Disciplina 629.8/9 Soggetti Embedded computer systems - Design and construction Digital control systems - Design and construction Lingua di pubblicazione Inglese **Formato** Materiale a stampa Livello bibliografico Monografia Note generali Description based upon print version of record. Nota di bibliografia Includes bibliographical references (p. 295-296) and index. Nota di contenuto front cover; copyright; table of contents; front matter; Preface; What's on the CD-ROM?; body; 1 The Basics; 1.1 Control Systems; 1.2 Anatomy of a Control System; 1.3 Closed Loop Control; 1.4 Controllers; 1.5 About This Book; 2 Z Transforms; 2.1 Signals and Systems; 2.2 Difference Equations; 2.3 The Z Transform; 2.4 The Inverse Z Transform; 2.5 Some Z Transform Properties; 2.6 Transfer Functions; 2.7 Stability in the Z Domain; 2.8 Frequency Response; 2.9 Conclusion; 3 Performance; 3.1 Tracking; 3.2 Frequency Response; 3.3 Disturbance Rejection: 3.4 Conclusion: 4 Block Diagrams 4.1 The Language of Blocks4.2 Analyzing Systems with Block Diagrams; 4.3 Conclusion; 5 Analysis; 5.1 Root Locus; 5.2 Bode Plots; 5.3 Nyquist Plots: 5.4 Conclusion: 6 Design: 6.1 Controllers, Filters and Compensators: 6.2 Compensation Topologies: 6.3 Types of Compensators; 6.4 Design Flow; 6.5 Conclusion; 7 Sampling Theory; 7.1 Sampling; 7.2 Aliasing; 7.3 Reconstruction; 7.4 Orthogonal Signals and Power; 7.5 Random Noise; 7.6 Nonideal Sampling; 7.7 The Laplace Transform; 7.8 z Domain Models; 7.9 Conclusion; 8 Nonlinear Systems; 8.1 Characteristics of Nonlinear Systems; 8.2 Some Nonlinearities 8.3 Linear Approximation 8.4 Nonlinear Compensators; 8.5 Conclusion;

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Sommario/riassunto

Many embedded engineers and programmers who need to implement basic process or motion control as part of a product design do not have formal training or experience in control system theory. Although some projects require advanced and very sophisticated control systems expertise, the majority of embedded control problems can be solved without resorting to heavy math and complicated control theory. However, existing texts on the subject are highly mathematical and theoretical and do not offer practical examples for embedded designers. This book is different; it presents mathematical background wi