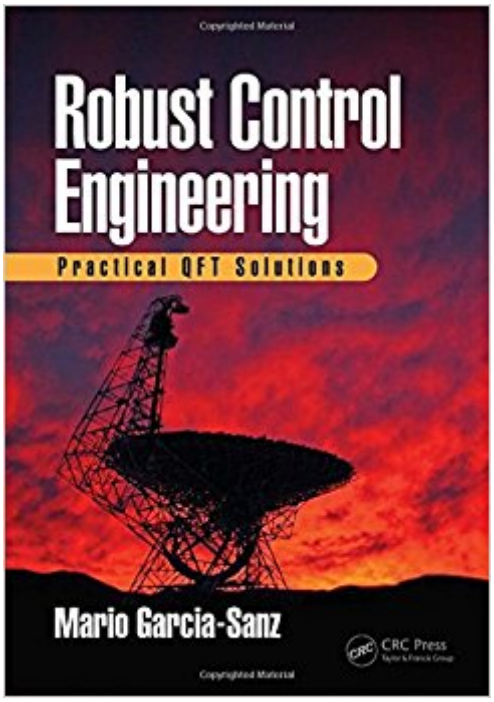
Robust Control Engineering: Practical QFT Solutions



Synopsis

This book thoroughly covers the fundamentals of the QFT robust control, as well as practical control solutions, for unstable, time-delay, non-minimum phase or distributed parameter systems, plants with large model uncertainty, high-performance specifications, nonlinear components, multi-input multi-output characteristics or asymmetric topologies. The reader will discover practical applications through a collection of fifty successful, real world case studies and projects, in which the author has been involved during the last twenty-five years, including commercial wind turbines, wastewater treatment plants, power systems, satellites with flexible appendages, spacecraft, large radio telescopes, and industrial manufacturing systems. Furthermore, the book presents problems and projects with the popular QFT Control Toolbox (QFTCT) for MATLAB, which was developed by the author.

Book Information

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Customer Reviews

"There had been a big vacuum as far as textbooks on QFT is concerned. The books in market are either outdated and not easily available or do not discuss examples with MATLAB extensively as your book does. Your book completely fills in that gap with more updated information and relevant MATLAB based examples. The book is complete and self-contained with a wide variety of examples as ranging from Satellite control to Wind Turbine control â “ all using QFT techniques. Further, from a student point of view, many projects have been discussed with QFT MATLAB toolbox which is a highlight of this book and hence a definite must have for anyone interested, doing research and

working in this field. The author has blended his practical experience also into this book which makes it unique and the favourite of any QFT designer."â • Rajesh Joseph Abraham, Indian Institute of Space Science & Technology, India

Prof. Mario GarcÃ- a-Sanz is one of the pioneers in the QFT robust control arena. Over the last 30 years, he has developed new QFT control theory for multi-input multi-output plants, distributed parameter systems, time-delay processes, nonlinear switching and feedforward control, including also methods to apply the Nyquist stability criterion in the Nichols chart, and to calculate QFT templates and bounds. In addition, he has designed many commercial control solutions for industry and space agencies. Customers include NASA-JPL, ESA-ESTEC, US-AFIT, NRAO-GBT, GMRT, Gamesa, Acciona, MTorres, IngeTeam, CENER, Eaton Corporation, Enercon, Siemens, Iberdrola, REE, Sener, EEQ, etc. With over 20 industrial patents and 200 research papers, Dr. GarcÃ- a-Sanz is one of the inventors of the TWT direct-drive variable-speed pitch-control multi-megawatt wind turbine, of the EAGLE airborne wind energy system, of the TWT variable-speed hydro-wind turbine, of the DeltaGrids optimal planning algorithms for electrical distribution networks, and of numerous advanced industrial controllers. In addition, he has been the Principal Investigator of over 50 funded research projects for industry, and worked as an international expert on wind turbine design and control in patent litigation at the British Court in London. As a Full Professor at the Public University of Navarra (Spain) and Senior Advisor for European wind energy companies, he played a central role in the design and field experimentation of multi-megawatt wind turbines for industry, including the advice of many PhD students and engineers in the field. Dr. GarcÃ- a-Sanz is currently a Professor and Founding Director of the Control and Energy Systems Center, and the inaugural Milton and Tamar Maltz Endowed Chair in Energy Innovation at Case Western Reserve University (http://cesc.case.edu). He also has been NATO/RTO Lecture Series Director for Advanced Controls, Visiting Professor at the Control Systems Centre, UMIST (UK); at Oxford University (UK); at the Jet Propulsion Laboratory NASA-JPL (California); and at the European Space Agency ESA-ESTEC (The Netherlands), and has given invited seminars in over 20 countries. He founded CoDyPower LLC, a consulting firm specialized on control systems, energy innovation and optimum planning of electrical distribution networks (http://codypower.com). Professor GarcÃ- a-Sanz’s CRC-Press three books "Quantitative Feedback Theory: Theory and Applications" (2006), "Wind Energy Systems: Control Engineering Design" (2012), and "Robust Control Engineering: Practical QFT Solutions" (2017) are among the best-selling books in QFT robust control and Wind turbine control. His QFT Control Toolbox for Matlab is considered as the top tool for designing QFT robust control systems.

Dr. GarcÃ- a-Sanz is Subject Editor of the International Journal of Robust and Nonlinear Control and was awarded the IEE Heaviside Prize (UK) in 1995, the BBVA research award (Spain) in 2001 and the CWRU Diekhoff Teaching Award (USA) in 2012 among other prizes.

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