



Advanced Control Foundation: Tools, Techniques and Applications

By Terrence Blevins

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In this book, the authors address the concepts and terminology that are needed to apply advanced control techniques in the process industry. The book is written for the process or control engineer that is familiar with traditional control but has little or no experience in designing, installing, commissioning and maintaining advanced control applications. Each chapter of the book is structured to allow a person to quickly understand the technology and how it is applied. Application examples are used to show what is required to address an application. Also, a section of each chapter is dedicated to a more in-depth discussion of the technology for the reader that is interested in understanding the mathematical basis for the technology. A workshop is provided at the end of each chapter that explores the technology. The reader may view the workshop solution by going to the web site that accompanies the book.

The book provides comprehensive coverage of the major advanced control techniques that are most commonly used in the process industry. This includes tools for monitoring control system performance, on-demand and adaptive tuning techniques, model predictive control, LP optimization, data analytics for batch and continuous processes, fuzzy logic control, neural networks and advancements in PID to use with wireless measurements. Since many readers may work with an existing DCS that does not support advanced control, a chapter of the book is dedicated to tools and techniques that the authors have found useful in integrating advanced control tools into an existing control system. Also, one chapter of the book addresses how dynamic process simulations may be easily created in a DCS to support checkout and operator training on the use of advanced control.

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Editorial Review

About the Author

Terrence L. "Terry" Blevins has been actively involved in the application and design of process control systems throughout his career. For more than 15 years, he worked as a systems engineer and group manager in the design and startup of advanced control solutions for the pulp and paper industry. Terry was instrumental in the establishment of Emerson Process Management's Advanced Control Program. From 1998-2005 Terry was the team lead for the development of DeltaV advanced control products. He is the Fieldbus Foundation team lead for the development and maintenance of the Function Block Specification and editor of the SIS Architecture and Model Specifications. In this capacity, Terry is involved in the adoption of Fieldbus Foundation function block work by international standards. Terry is the US expert to the IEC SC65E WG7 function block committee that is responsible for the IEC 61804 function block standards. He is a voting member and chairman of ISA SP104-EDDL (Electronic Device Description Language) committee and is the technical advisor to the United States Technical Advisory Group (USTAG) for the IEC65E subcommittee. He is also a member of the USNC TAG (IEC/SC65 and IEC/TC65). Terry authored "An Overview of the ISA/IEC Fieldbus," Section 11, Standards Overview, Fifth Edition of the Process/Industrial Instruments and Controls Handbook and coauthored four sections in the Fourth Edition of the Instrumentation Engineer's Handbook, Process Control and Optimization. He coauthored the ISA bestselling books Advanced Control Unleashed and Control Loop Foundation. He has over 45 patents and has written over 70 papers on process control system design and applications. Terry received a Bachelor of Science in Electrical Engineering from the University of Louisville in 1971 and a Master of Science in Electrical Engineering from Purdue University in 1973. In 2004, he was inducted into Control Magazine's Process Automation Hall of Fame. Presently, Terry is a principal technologist in the future architecture team of DeltaV Product Engineering at Emerson Process Management.

Willy Wojsznis has been involved in the development of advanced control products over the last twenty years focusing on model predictive control, data analytics, and auto tuning. Over the previous nearly 25-years of his career he developed computer control systems and applications in the cement, steel, mining, and paper industries. His professional work resulted in a number of successful and innovative advanced control products, over thirty patents, and over forty technical papers. He received a control engineering degree (EE) from Kiev Technical University in 1964, an M.S. in Applied Mathematics from Wroclaw University in 1972, and a Ph.D. from Warsaw University of Technology in 1973. He coauthored the ISA bestselling book Advanced Control Unleashed. In 2010, he was inducted into Control Magazine's Process Automation Hall of Fame. Presently, Willy is part of the DeltaV future architecture team. He conducts applied research in the areas of optimization, adaptive control, data analytics, and model predictive control.

Mark Nixon has been involved in the design and development of control systems throughout his career. Mark started his career as a systems engineer working on projects in oil and gas, refining, chemicals, and pulp and paper. In 1998, he moved from Canada to Austin, TX, where he has held a variety of positions in both research and development. From 1995 to 2005 Mark was lead architect for DeltaV. In 2006 he joined the wireless team, taking a very active role in the development of the WirelessHART specifications and the development of the IEC 62591 standardization. Mark's current research includes control using WirelessHART devices, data analytics for batch processes, wireless technology in the process industry, web based user interfaces, operator interfaces, and advanced graphics. He is currently active in the Center for Operator Performance (<http://www.operatorperformance.org>), WirelessHART, ISA88, Foundation Fieldbus standards (<http://www.fieldbus.org/>), and ISA101. He has written numerous papers and currently holds over

70 patents. He coauthored WirelessHART: Real-Time Mesh Network for Industrial Automation and has made contributions to the Industrial Instruments and Controls Handbook and Modern Measurement and Final Element Essentials for the Process Industry. He coauthored the ISA bestselling book Control Loop Foundation. In 2012, he was inducted into Control Magazine's Process Automation Hall of Fame. Mark received his Bachelor of Science in Electrical Engineering from the University of Waterloo in 1982.

Users Review

From reader reviews:

Anna Harlow:

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Ruth Nicholson:

Spent a free time and energy to be fun activity to try and do! A lot of people spent their down time with their family, or all their friends. Usually they carrying out activity like watching television, going to beach, or picnic within the park. They actually doing same thing every week. Do you feel it? Do you wish to something different to fill your free time/ holiday? Could possibly be reading a book can be option to fill your cost-free time/ holiday. The first thing that you ask may be what kinds of publication that you should read. If you want to test look for book, may be the reserve untitled Advanced Control Foundation: Tools, Techniques and Applications can be great book to read. May be it could be best activity to you.

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