

## Feedback Control Systems Demystified Volume 1 Designing Pid Controllers

This book, first published in 2003, provides a concise but sound treatment of ODEs, including IVPs, BVPs, and DDEs.

This book gives clear and effective instructions, stuffed with practical examples, to build your own fun, stunning and highly-interactive openFrameworks applications. Each chapter is focused differently and has a new theme to it, This book targets visual artists, designers, programmers and those interested in creative coding by getting started with openFrameworks. This book will help you understand the capabilities of openFrameworks to help you create visually stunning and fully interactive applications. You should have a basic knowledge of object oriented programming, such as C++, Java, Python, ActionScript 3, etc.

Lees' is industry's first stop for process safety information. Lees' 4e is the comprehensive and scaleable source of professional industrial process safety and loss prevention information. Available in print and electronic formats, and online with additional new tools and an annual update schedule, Lees' provides users with the information they require to ensure process safety. Volume 1 covers legislation, engineering and design: Key topics include law; major hazard control; economics and insurance; reliability engineering; hazard identification; hazard assessment; process design; pressure system design; control system design; emission and dispersion; and fire. Volume 2 covers operation and practical safety: Key topics include explosion, toxic release, plant operation, storage, transport, emergency planning, personal safety, accident research, reactive chemicals, safety instrumented systems, and chemical security. Volume 3 contains the case histories and data, including ACMH model license conditions; HSE guidelines' public planning inquiries; standards and codes; process safety management (PSM) regulations in the United States; risk management program regulations \* THE process safety encyclopedia, trusted worldwide for over 30 years \* Now available in print and online, to aid searchability and portability \* Over 3600 print pages cover the full scope of process safety and loss prevention, compiling theory, practice, standards, legislation, case studies and lessons learned, in one resource as opposed to multiple sources.

Written for senior level or first year graduate level robotics courses, this text includes material from traditional mechanical engineering, control theoretical material and computer science. It includes coverage of rigid-body transformations and forward and inverse positional kinematics. Tough Test Questions? Missed Lectures? Not Enough Time? Fortunately for you, there's Schaum's. This all-in-one-package includes more than 700 fully solved problems, examples, and practice exercises to sharpen your problem-solving skills. Plus, you will have access to 20 detailed videos featuring instructors who explain the most commonly tested problems--it's just like having your own virtual tutor! You'll find everything you need to build confidence, skills, and knowledge for the highest score possible. More than 40 million students have trusted Schaum's to help them succeed in the classroom and on exams. Schaum's is the key to faster learning and higher grades in every subject. Each Outline presents all the essential course information in an easy-to-follow, topic-by-topic format. You also get hundreds of examples, solved problems, and practice exercises to test your skills. This Schaum's Outline gives you 700 fully solved problems Extra practice on topics such as differential equations and linear systems, transfer functions, block diagram algebra, and more Support for all major textbooks for feedback and control systems courses Fully compatible with your classroom text, Schaum's highlights all the important facts you need to know. Use Schaum's to shorten your study time--and get your best test scores! Schaum's Outlines--Problem Solved.

Best selling author Bruce Eckel has joined forces with Chuck Allison to write Thinking in C++, Volume 2, the sequel to the highly received and

best selling Thinking in C++, Volume 1. Eckel is the master of teaching professional programmers how to quickly learn cutting edge topics in C++ that are glossed over in other C++ books. In Thinking in C++, Volume 2, the authors cover the finer points of exception handling, defensive programming and string and stream processing that every C++ programmer needs to know. Special attention is given to generic programming where the authors reveal little known techniques for effectively using the Standard Template Library. In addition, Eckel and Allison demonstrate how to apply RTTI, design patterns and concurrent programming techniques to improve the quality of industrial strength C++ applications. This book is targeted at programmers of all levels of experience who want to master C++.

Modeling Engineering Systems goes right to the heart of engineering, teaching you how to: understand and use the three basic types of engineering building blocks recognize the analogies that can be drawn between the fundamental elements of electrical, mechanical, fluid, and thermal systems develop math models for first- and higher-order systems using four fundamental methods analyze the models you develop perform frequency analysis and plot frequency responses Educated at the U.S. Coast Guard Academy and MIT, Jack W. Lewis is a registered professional engineer, his specialty is the design of automatic control and instrumental systems, especially as related to the marine industry. He is the author of numerous technical papers and articles, including national award-winning papers for the American Society of Naval Engineers (ASNE) and the Society of Naval Architects and Marine Engineers (SNAME). Lewis is a member of SNAME, ASNE, and the American Society of Mechanical Engineers (ASME). -understand and use the three basic types of engineering building blocks -recognize the analogies that can be drawn between the fundamental elements of electrical, mechanical, fluid, and thermal systems -develop math models for first- and higher-order systems using four fundamental methods

Cover -- Half-title -- Title -- Copyright -- Dedication -- Contents -- Preface -- 1 Youth and Media -- 2 Then and Now -- 3 Themes and Theoretical Perspectives -- 4 Infants, Toddlers, and Preschoolers -- 5 Children -- 6 Adolescents -- 7 Media and Violence -- 8 Media and Emotions -- 9 Advertising and Commercialism -- 10 Media and Sex -- 11 Media and Education -- 12 Digital Games -- 13 Social Media -- 14 Media and Parenting -- 15 The End -- Notes -- Acknowledgments -- Index -- A -- B -- C -- D -- E -- F -- G -- H -- I -- J -- K -- L -- M -- N -- O -- P -- Q -- R -- S -- T -- U -- V -- W -- X -- Y -- Z

This textbook explores both the theoretical foundation of the Finite Volume Method (FVM) and its applications in Computational Fluid Dynamics (CFD). Readers will discover a thorough explanation of the FVM numerics and algorithms used for the simulation of incompressible and compressible fluid flows, along with a detailed examination of the components needed for the development of a collocated unstructured pressure-based CFD solver. Two particular CFD codes are explored. The first is uFVM, a three-dimensional unstructured pressure-based finite volume academic CFD code, implemented within Matlab. The second is OpenFOAM®, an open source framework used in the development of a range of CFD programs for the simulation of industrial scale flow problems. With over 220 figures, numerous examples and more than one hundred exercise on FVM numerics, programming, and applications, this textbook is suitable for use in an introductory course on the FVM, in an advanced course on numerics, and as a reference for CFD programmers and researchers.

In-depth instruction and practical techniques for building with the BeagleBone embedded Linux platform Exploring BeagleBone is a hands-on guide to bringing gadgets, gizmos, and robots to life using the popular BeagleBone embedded Linux platform. Comprehensive content and deep detail provide more than just a BeagleBone instruction manual—you'll also learn the underlying engineering techniques that will allow you to create your own projects. The book begins with a foundational primer on essential skills, and then gradually moves into communication, control, and advanced applications using C/C++, allowing you to learn at your own pace. In addition, the book's companion website

features instructional videos, source code, discussion forums, and more, to ensure that you have everything you need. The BeagleBone's small size, high performance, low cost, and extreme adaptability have made it a favorite development platform, and the Linux software base allows for complex yet flexible functionality. The BeagleBone has applications in smart buildings, robot control, environmental sensing, to name a few; and, expansion boards and peripherals dramatically increase the possibilities. Exploring BeagleBone provides a reader-friendly guide to the device, including a crash course in computer engineering. While following step by step, you can: Get up to speed on embedded Linux, electronics, and programming Master interfacing electronic circuits, buses and modules, with practical examples Explore the Internet-connected BeagleBone and the BeagleBone with a display Apply the BeagleBone to sensing applications, including video and sound Explore the BeagleBone's Programmable Real-Time Controllers Hands-on learning helps ensure that your new skills stay with you, allowing you to design with electronics, modules, or peripherals even beyond the BeagleBone. Insightful guidance and online peer support help you transition from beginner to expert as you master the techniques presented in Exploring BeagleBone, the practical handbook for the popular computing platform.

How can you take advantage of feedback control for enterprise programming? With this book, author Philipp K. Janert demonstrates how the same principles that govern cruise control in your car also apply to data center management and other enterprise systems. Through case studies and hands-on simulations, you'll learn methods to solve several control issues, including mechanisms to spin up more servers automatically when web traffic spikes. Feedback is ideal for controlling large, complex systems, but its use in software engineering raises unique issues. This book provides basic theory and lots of practical advice for programmers with no previous background in feedback control. Learn feedback concepts and controller design Get practical techniques for implementing and tuning controllers Use feedback "design patterns" for common control scenarios Maintain a cache's "hit rate" by automatically adjusting its size Respond to web traffic by scaling server instances automatically Explore ways to use feedback principles with queueing systems Learn how to control memory consumption in a game engine Take a deep dive into feedback control theory

The first comprehensive treatment of active inference, an integrative perspective on brain, cognition, and behavior used across multiple disciplines. Active inference is a way of understanding sentient behavior—a theory that characterizes perception, planning, and action in terms of probabilistic inference. Developed by theoretical neuroscientist Karl Friston over years of groundbreaking research, active inference provides an integrated perspective on brain, cognition, and behavior that is increasingly used across multiple disciplines including neuroscience, psychology, and philosophy. Active inference puts the action into perception. This book offers the first comprehensive treatment of active inference, covering theory, applications, and cognitive domains. Active inference is a "first principles" approach to understanding behavior and the brain, framed in terms of a single imperative to minimize free energy. The book emphasizes the implications of the free energy principle for understanding how the brain works. It first introduces active inference both conceptually and formally, contextualizing it within current theories of cognition. It then provides specific examples of computational models that use active inference to explain such cognitive phenomena as perception, attention, memory, and planning.

This textbook is ideal for a course in engineering systems dynamics and controls. The work is a comprehensive treatment of the analysis of lumped parameter physical systems. Starting with a discussion of mathematical models in general, and ordinary differential equations, the book covers input/output and state space models, computer simulation and modeling methods and techniques in mechanical, electrical, thermal and fluid domains. Frequency domain methods, transfer functions and frequency response are covered in detail. The book concludes

with a treatment of stability, feedback control (PID, lead-lag, root locus) and an introduction to discrete time systems. This new edition features many new and expanded sections on such topics as: solving stiff systems, operational amplifiers, electrohydraulic servovalves, using Matlab with transfer functions, using Matlab with frequency response, Matlab tutorial and an expanded Simulink tutorial. The work has 40% more end-of-chapter exercises and 30% more examples.

Written from a practical perspective, *Advances in Reactor Measurement and Control* underscores how control system design can address the different process responses and fundamental characteristics of the major types of reactors in the process industry. This book enables the reader to learn what measurements, control strategies, controller features and tuning parameters will achieve process objectives for a given type of reactor. No prior education or experience in process engineering or control theory is needed. This book starts with the fundamentals and principles needed to become proficient in getting the best reactor and control system performance. The practitioner will be able to design, implement and support straightforward configurations based on the type of process and equipment. McMillan--the author of more than 20 books, including several ISA best sellers, Process Automation Hall of Fame Inductee and the recipient of the ISA Life Achievement Award--educates through a practitioner's experience and perspective, outlining the general concepts and details, from the field to the control room, for the control and optimization of batch and continuous reactors. "Taking a practitioner's approach, I believe, is unique," McMillan says. "The concepts in this book are developed to help the reader understand the fundamental differences in reactor applications and improve the performance of nearly all types of reactors. This book is unique in providing readily configurable practical solutions for batch and fluidized bed reactors besides the more traditional continuous stirred tank reactors. According to McMillan, the book's practical value is reinforced through its:

- Simple presentation of the characteristics and implications of each of the dynamic responses needed to achieve the necessary efficiency, capacity, quality, and safety in operation.
- Clear explanation of the PID features and tuning and control loops needed for addressing the lack of smoothing in dead time dominant processes and the lack of negative feedback in integrating and runaway processes.

The material in this book represents knowledge from leading participants in the ISA Mentor program, Brian Hrankowsky and Héctor Torres, reflecting decades of experience in the pharmaceutical and chemical industry, respectively.

This open access book chronicles the rise of a new scientific paradigm offering novel insights into the age-old enigmas of existence. Over 300 years ago, the human mind discovered the machine code of reality: mathematics. By utilizing abstract thought systems, humans began to decode the workings of the cosmos. From this understanding, the current scientific paradigm emerged, ultimately discovering the gift of technology. Today, however, our island of knowledge is surrounded by ever longer shores of ignorance. Science appears to have hit a dead end when confronted with the nature of reality and consciousness. In this fascinating and accessible volume, James Glattfelder explores a radical paradigm shift uncovering the ontology of reality. It is found to be information-theoretic and participatory, yielding a computational and programmable universe.

This book deals with risk capital provided for established firms outside the stock market, private equity, which has grown rapidly over the last three decades, yet is largely poorly understood. Although it has often been criticized in the public mind as being short termist and having adverse consequences for employment, in reality this is far from the case. Here, John Gilligan and Mike Wright dispel some of the biggest myths and misconceptions about private equity. The book provides a unique and authoritative source from a leading practitioner and academic for practitioners, policymakers, and researchers that explains in detail what private equity involves and reviews systematic evidence of what the impact of private equity has been. Written in a highly accessible style, the book takes the reader through what private

equity means, the different actors involved, and issues concerning sourcing, checking out, valuing, and structuring deals. The various themes from the systematic academic evidence are highlighted in numerous summary vignettes placed alongside the text that discuss the practical aspects. The main part of the work concludes with an up-to-date discussion by the authors, informed commentators on the key issues in the lively debate about private equity. The book further contains summary tables of the academic research carried out over the past three decades across the private equity landscape including: the returns to investors, economic performance, impact on R&D and employees, and the longevity and life-cycle of private equity backed deals.

During the ten years since the appearance of the groundbreaking, bestselling first edition of *The Electronics Handbook*, the field has grown and changed tremendously. With a focus on fundamental theory and practical applications, the first edition guided novice and veteran engineers along the cutting edge in the design, production, installation, operation, and maintenance of electronic devices and systems. Completely updated and expanded to reflect recent advances, this second edition continues the tradition. *The Electronics Handbook, Second Edition* provides a comprehensive reference to the key concepts, models, and equations necessary to analyze, design, and predict the behavior of complex electrical devices, circuits, instruments, and systems. With 23 sections that encompass the entire electronics field, from classical devices and circuits to emerging technologies and applications, *The Electronics Handbook, Second Edition* not only covers the engineering aspects, but also includes sections on reliability, safety, and engineering management. The book features an individual table of contents at the beginning of each chapter, which enables engineers from industry, government, and academia to navigate easily to the vital information they need. This is truly the most comprehensive, easy-to-use reference on electronics available.

In this day and age everything around us is automatic and our desire to automate more stuff is only increasing. Control systems finds its applications in everything you can possibly think of. The concept of Control system plays an important role in the working of, everything from home appliances to guided missiles to self-driving cars. These are just the examples of Control systems we create. Control systems also exist in nature. Within our own body, there are numerous control systems, such as the pancreas, which regulate our blood sugar. In the most abstract sense it is possible to consider every physical object a control system. Hence from an engineering perspective, it is absolutely crucial to be familiar with the analysis and designing methods of such Control systems. Control systems is one of those subjects that go beyond a particular branch of engineering. Control systems find its application in Mechanical, Electrical, Electronics, Civil Engineering and many other branches of engineering. Although this book is written in an Electrical engineering context, we are sure that others can also easily follow the topics and learn a thing or two about Control systems. In this book we provide a concise introduction into classical Control theory. A basic knowledge of Calculus and some Physics are the only prerequisites required to follow the topics discussed in the book. In this book, We've tried to explain the various fundamental concepts of Control Theory in an intuitive manner with minimum math. Also, We've tried to connect the various topics with real life situations wherever possible. This way even first timers can learn the basics of Control systems with minimum effort. Hopefully the students will enjoy this different approach to Control Systems. The various concepts of the subject

are arranged logically and explained in a simple reader-friendly language with MATLAB examples. This book is not meant to be a replacement for those standard Control systems textbooks, rather this book should be viewed as an introductory text for beginners to come in grips with advanced level topics covered in those books. This book will hopefully serve as inspiration to learn Control systems in greater depths.

The managed flow of goods and information from raw material to final sale also known as a "supply chain" affects everything--from the U.S. gross domestic product to where you can buy your jeans. The nature of a company's supply chain has a significant effect on its success or failure--as in the success of Dell Computer's make-to-order system and the failure of General Motor's vertical integration during the 1998 United Auto Workers strike. Supply Chain Integration looks at this crucial component of business at a time when product design, manufacture, and delivery are changing radically and globally. This book explores the benefits of continuously improving the relationship between the firm, its suppliers, and its customers to ensure the highest added value. This book identifies the state-of-the-art developments that contribute to the success of vertical tiers of suppliers and relates these developments to the capabilities that small and medium-sized manufacturers must have to be viable participants in this system. Strategies for attaining these capabilities through manufacturing extension centers and other technical assistance providers at the national, state, and local level are suggested. This book identifies action steps for small and medium-sized manufacturers--the "seed corn" of business start-up and development--to improve supply chain management. The book examines supply chain models from consultant firms, universities, manufacturers, and associations. Topics include the roles of suppliers and other supply chain participants, the rise of outsourcing, the importance of information management, the natural tension between buyer and seller, sources of assistance to small and medium-sized firms, and a host of other issues. Supply Chain Integration will be of interest to industry policymakers, economists, researchers, business leaders, and forward-thinking executives.

There's no easier, faster, or more practical way to learn the really tough subjects McGraw-Hill's Demystified titles are the most efficient, interestingly written, brush-ups you can find. Organized as self-teaching guides, they come complete with key points, background information, questions at the end of each chapter, and even final exams. You'll be able to learn more in less time, evaluate your strengths and weaknesses, and reinforce your knowledge and confidence. This complete self-teaching guide takes an introductory approach to robotics, guiding readers through the essential electronics, mechanics, and programming skills necessary to build their own robot.

For tests after July 1, 2018. Here's the "Easy Way" to get your Technician Class amateur radio license. The book is new so check the reviews for the previous edition. The test is multiple choice and the other study guides take you through the pool of 424 questions including all four possible answers for each question. But three out of the four answers are **WRONG!** You are studying 1,272 wrong answers and that is both confusing and frustrating. The Easy Way focuses only on the right answers with hints, cheats and explanations to help you pass. It is all Ham and no Spam. The first part is a narrative of the author's ham radio experience. Every question and answer is woven into the story and identified in bold print. The second part is a 40-page Quick

Summary condensing every question and correct answer for easy recall. Which would you rather study: right answers or over 200 pages with three quarters of the answers wrong? Instructors: This book is perfect for review or weekend courses. Have the students read the narrative before class, then go over the concepts with them rather than slogging through all those wrong answers. You'll be done in no time and the students will be fully prepared to take their tests.

Virtual Storage Access Method (VSAM) is one of the access methods used to process data. Many of us have used VSAM and work with VSAM data sets daily, but exactly how it works and why we use it instead of another access method is a mystery. This book helps to demystify VSAM and gives you the information necessary to understand, evaluate, and use VSAM properly. This book also builds upon the subject of Record Level Sharing and DFSMSStvs. It clarifies VSAM functions for application programmers who work with VSAM. The practical, straightforward approach should dispel much of the complexity associated with VSAM. Wherever possible an example is used to reinforce a description of a VSAM function. This IBM® Redbooks® publication is intended as a supplement to existing product manuals. It is intended to be used as an initial point of reference for VSAM functions. This book contains a selection of articles from The 2014 World Conference on Information Systems and Technologies (WorldCIST'14), held between the 15th and 18th of April in Funchal, Madeira, Portugal, a global forum for researchers and practitioners to present and discuss recent results and innovations, current trends, professional experiences and challenges of modern Information Systems and Technologies research, technological development and applications. The main topics covered are: Information and Knowledge Management; Organizational Models and Information Systems; Intelligent and Decision Support Systems; Software Systems, Architectures, Applications and Tools; Computer Networks, Mobility and Pervasive Systems; Radar Technologies; Human-Computer Interaction; Health Informatics and Information Technologies in Education.

The ABCs of z/OS System Programming is a thirteen-volume collection that provides an introduction to the z/OS operating system and the hardware architecture. Whether you are a beginner or an experienced system programmer, the ABCs collection provides the information that you need to start your research into z/OS and related subjects. If you want to become more familiar with z/OS in your current environment, or if you are evaluating platforms to consolidate your e-business applications, the ABCs collection will serve as a powerful technical tool. The contents of the volumes are: Volume 1: Introduction to z/OS and storage concepts, TSO/E, ISPF, JCL, SDSF, and z/OS delivery and installation Volume 2: z/OS implementation and daily maintenance, defining subsystems, JES2 and JES3, LPA, LNKLST, authorized libraries, Language Environment, and SMP/E Volume 3: Introduction to DFSMS, data set basics, storage management hardware and software, VSAM, System-Managed Storage, catalogs, and DFSMSStvs Volume 4: Communication Server, TCP/IP and VTAM Volume 5: Base and Parallel Sysplex, System Logger, Resource Recovery Services (RRS), global resource serialization (GRS), z/OS system operations, automatic restart management (ARM), Geographically Dispersed Parallel Sysplex (GPDS), availability in the zSeries environment Volume 6: Introduction to security, RACF, Digital certificates and PKI, Kerberos, cryptography and z990 integrated cryptography, zSeries firewall technologies, LDAP, Enterprise Identity Mapping (EIM), and firewall technologies Volume 7: Printing in a z/OS environment, Infoprint Server and Infoprint Central

Volume 8: An introduction to z/OS problem diagnosis Volume 9: z/OS UNIX System Services Volume 10: Introduction to z/Architecture, zSeries processor design, zSeries connectivity, LPAR concepts, HCD, and HMC Volume 11: Capacity planning, performance management, RMF, and SMF Volume 12: WLM Volume 13: JES3

David Gibson uses 3D visual representations of sounds in a mix as a tool to explain the dynamics that can be created in a mix. This book provides an in-depth exploration into the aesthetics of what makes a great mix. Gibson's unique approach explains how to map sounds to visuals in order to create a visual framework that can be used to analyze what is going on in any mix. Once you have the framework down, Gibson then uses it to explain the traditions that have been developed over time by great recording engineers for different styles of music and songs. You will come to understand everything that can be done in a mix to create dynamics that affect people in really deep ways. Once you understand what engineers are doing to create the great mixes they do, you can then use this framework to develop your own values as to what you feel is a good mix. Once you have a perspective on what all can be done, you have the power to be truly creative on your own – to create whole new mixing possibilities. It is all about creating art out of technology. This book goes beyond explaining what the equipment does – it explains what to do with the equipment to make the best possible mixes.

This book was written primarily from the standpoint of an engineering design organization, and based on years of experience with large design projects as well as on personal plant experience. Most new investment dollars go into new or modernized facilities, and it is in the design phase of projects for these facilities that the most opportunities occur and flexibility exists to influence process control. Consequently this book is aimed primarily at design personnel; however, it will also be useful to those who have to operate or troubleshoot existing plants. It is the purpose of this book to indicate the range of technology, which has been developed for distillation control, to the point where it can be economically and reliably used for design.

The essential introduction to the principles and applications of feedback systems—now fully revised and expanded This textbook covers the mathematics needed to model, analyze, and design feedback systems. Now more user-friendly than ever, this revised and expanded edition of Feedback Systems is a one-volume resource for students and researchers in mathematics and engineering. It has applications across a range of disciplines that utilize feedback in physical, biological, information, and economic systems. Karl Åström and Richard Murray use techniques from physics, computer science, and operations research to introduce control-oriented modeling. They begin with state space tools for analysis and design, including stability of solutions, Lyapunov functions, reachability, state feedback observability, and estimators. The matrix exponential plays a central role in the analysis of linear control systems, allowing a concise development of many

of the key concepts for this class of models. Åström and Murray then develop and explain tools in the frequency domain, including transfer functions, Nyquist analysis, PID control, frequency domain design, and robustness. Features a new chapter on design principles and tools, illustrating the types of problems that can be solved using feedback Includes a new chapter on fundamental limits and new material on the Routh-Hurwitz criterion and root locus plots Provides exercises at the end of every chapter Comes with an electronic solutions manual An ideal textbook for undergraduate and graduate students Indispensable for researchers seeking a self-contained resource on control theory

We live in a networked world. Online social networking platforms and the World Wide Web have changed how society thinks about connectivity. Because of the technological nature of such networks, their study has predominantly taken place within the domains of computer science and related scientific fields. But arts and humanities scholars are increasingly using the same kinds of visual and quantitative analysis to shed light on aspects of culture and society hitherto concealed. This Element contends that networks are a category of study that cuts across traditional academic barriers, uniting diverse disciplines through a shared understanding of complexity in our world. Moreover, we are at a moment in time when it is crucial that arts and humanities scholars join the critique of how large-scale network data and advanced network analysis are being harnessed for the purposes of power, surveillance, and commercial gain. This title is also available as Open Access on Cambridge Core.

It is April of 1861. The shocking events at Fort Sumter are having devastating effects on Alexander Swaney, living on his family farm in Pennsylvania just a few miles north of the border with western Virginia. He watches as Virginia fights its own civil war, as the disaffected western counties, long neglected by Richmond, attempt to secede from the rest of the state. Their political struggle produces the first land conflicts of the larger War of the Rebellion, involving the future military giants George McClellan, Stonewall Jackson, and Robert E. Lee fighting in the rugged mountains of western Virginia, soon to be a new state. As events sweep Alexander along in their path, he struggles to maintain some control over his destiny. Should he volunteer to join the Union army and fight to preserve the land he loves, but leave behind the girl he hopes to marry, as well as his family, at the mercy of marauders and bushwhackers? Adding to Alexander's confusion is the fact that Sophia isn't sure she's ready to marry him, and a rival for her affections is on the scene in the form of his unpatriotic cousin Tip, a rake who has had his eye on Sophia. Fortunately, Alexander has a close friend in Harry Hagans, a young pastor who also feels the call to arms from his desire to bring an end to slavery. As the storms of war bear down on them, Harry and Alexander share a convoluted journey, ultimately arriving at their military home, the 1st Regiment of Loyal Virginia Volunteer Cavalry, later to become the 1st West Virginia Volunteer Cavalry. Along the way, their friendship is threatened when Harry reveals a dark secret that shakes Alexander's trust. A detailed glimpse into

a portion of Civil War history largely unknown, Storm Coming is a luminous story of a young man's coming of age and the birth of a new state out of the storms of war.

Praise for the first edition: "This excellent text will be useful to every system engineer (SE) regardless of the domain. It covers ALL relevant SE material and does so in a very clear, methodical fashion. The breadth and depth of the author's presentation of SE principles and practices is outstanding." –Philip Allen This textbook presents a comprehensive, step-by-step guide to System Engineering analysis, design, and development via an integrated set of concepts, principles, practices, and methodologies. The methods presented in this text apply to any type of human system -- small, medium, and large organizational systems and system development projects delivering engineered systems or services across multiple business sectors such as medical, transportation, financial, educational, governmental, aerospace and defense, utilities, political, and charity, among others. Provides a common focal point for "bridging the gap" between and unifying System Users, System Acquirers, multi-discipline System Engineering, and Project, Functional, and Executive Management education, knowledge, and decision-making for developing systems, products, or services Each chapter provides definitions of key terms, guiding principles, examples, author's notes, real-world examples, and exercises, which highlight and reinforce key SE&D concepts and practices Addresses concepts employed in Model-Based Systems Engineering (MBSE), Model-Driven Design (MDD), Unified Modeling Language (UMLTM) / Systems Modeling Language (SysMLTM), and Agile/Spiral/V-Model Development such as user needs, stories, and use cases analysis; specification development; system architecture development; User-Centric System Design (UCSD); interface definition & control; system integration & test; and Verification & Validation (V&V) Highlights/introduces a new 21st Century Systems Engineering & Development (SE&D) paradigm that is easy to understand and implement. Provides practices that are critical staging points for technical decision making such as Technical Strategy Development; Life Cycle requirements; Phases, Modes, & States; SE Process; Requirements Derivation; System Architecture Development, User-Centric System Design (UCSD); Engineering Standards, Coordinate Systems, and Conventions; et al. Thoroughly illustrated, with end-of-chapter exercises and numerous case studies and examples, Systems Engineering Analysis, Design, and Development, Second Edition is a primary textbook for multi-discipline, engineering, system analysis, and project management undergraduate/graduate level students and a valuable reference for professionals.

The fundamental mathematical tools needed to understand machine learning include linear algebra, analytic geometry, matrix decompositions, vector calculus, optimization, probability and statistics. These topics are traditionally taught in disparate courses, making it hard for data science or computer science students, or professionals, to efficiently learn the mathematics. This self-contained textbook bridges the gap between mathematical and machine learning texts,

introducing the mathematical concepts with a minimum of prerequisites. It uses these concepts to derive four central machine learning methods: linear regression, principal component analysis, Gaussian mixture models and support vector machines. For students and others with a mathematical background, these derivations provide a starting point to machine learning texts. For those learning the mathematics for the first time, the methods help build intuition and practical experience with applying mathematical concepts. Every chapter includes worked examples and exercises to test understanding. Programming tutorials are offered on the book's web site.

This comprehensive text on control systems is designed for undergraduate students pursuing courses in electronics and communication engineering, electrical and electronics engineering, telecommunication engineering, electronics and instrumentation engineering, mechanical engineering, and biomedical engineering. Appropriate for self-study, the book will also be useful for AMIE and IETE students. Written in a student-friendly readable manner, the book, now in its Second Edition, explains the basic fundamentals and concepts of control systems in a clearly understandable form. It is a balanced survey of theory aimed to provide the students with an in-depth insight into system behaviour and control of continuous-time control systems. All the solved and unsolved problems in this book are classroom tested, designed to illustrate the topics in a clear and thorough way. **NEW TO THIS EDITION**• One new chapter on Digital control systems• Complete answers with figures• Root locus plots and Nyquist plots redrawn as per MATLAB output• MATLAB programs at the end of each chapter• Glossary at the end of chapters **KEY FEATURES**• Includes several fully worked-out examples to help students master the concepts involved. • Provides short questions with answers at the end of each chapter to help students prepare for exams confidently. • Offers fill in the blanks and objective type questions with answers at the end of each chapter to quiz students on key learning points. • Gives chapter-end review questions and problems to assist students in reinforcing their knowledge. Solution Manual is available for adopting faculty.

Introduction to state-space methods covers feedback control; state-space representation of dynamic systems and dynamics of linear systems; frequency-domain analysis; controllability and observability; shaping the dynamic response; more. 1986 edition.

Every enterprise application creates data, whether it's log messages, metrics, user activity, outgoing messages, or something else. And how to move all of this data becomes nearly as important as the data itself. If you're an application architect, developer, or production engineer new to Apache Kafka, this practical guide shows you how to use this open source streaming platform to handle real-time data feeds.

Engineers from Confluent and LinkedIn who are responsible for developing Kafka explain how to deploy production Kafka clusters, write reliable event-driven microservices, and build scalable stream-processing applications with this platform. Through detailed examples, you'll learn Kafka's design principles, reliability guarantees, key APIs, and architecture details, including the replication protocol, the controller, and the storage layer. Understand publish-subscribe messaging and how it fits in the big data ecosystem. Explore Kafka producers and consumers for writing and reading messages Understand Kafka patterns and use-case requirements to ensure reliable data delivery Get best

practices for building data pipelines and applications with Kafka Manage Kafka in production, and learn to perform monitoring, tuning, and maintenance tasks Learn the most critical metrics among Kafka's operational measurements Explore how Kafka's stream delivery capabilities make it a perfect source for stream processing systems

This is the most definitive, informative video reference available, made more compelling by the authors inclusion of the hottest new trends and cutting-edge development in the field. This book will serve as an invaluable guide to the designers and engineers who will design, create and deliver these products and services.

· In-depth coverage of modern digital implementations of frequency synthesis architectures · Numerous design examples drawn from actual engineering projects Digital frequency synthesis is used in modern wireless and communications technologies such as radar, cellular telephony, satellite communications, electronic imaging, and spectroscopy. This book is a comprehensive overview of digital frequency synthesis theory and applications, with a particular emphasis on the latest approaches using fractional-N phase-locked loop technology. In-depth coverage of modern digital implementations of frequency synthesis architectures Numerous design examples drawn from actual engineering projects

Presenting a comprehensive overview of the design automation algorithms, tools, and methodologies used to design integrated circuits, the Electronic Design Automation for Integrated Circuits Handbook is available in two volumes. The second volume, EDA for IC Implementation, Circuit Design, and Process Technology, thoroughly examines real-time logic to GDSII (a file format used to transfer data of semiconductor physical layout), analog/mixed signal design, physical verification, and technology CAD (TCAD). Chapters contributed by leading experts authoritatively discuss design for manufacturability at the nanoscale, power supply network design and analysis, design modeling, and much more. Save on the complete set.

Written to be equally useful for all engineering disciplines, this book is organized around the concept of control systems theory as it has been developed in the frequency and time domains. It provides coverage of classical control employing root locus design, frequency and response design using Bode and Nyquist plots. It also covers modern control methods based on state variable models including pole placement design techniques with full-state feedback controllers and full-state observers. The book covers several important topics including robust control systems and system sensitivity, state variable models, controllability and observability, computer control systems, internal model control, robust PID controllers, and computer-aided design and analysis. For all types of engineers who are interested in a solid introduction to control systems.

Praise for How Learning Works "How Learning Works is the perfect title for this excellent book. Drawing upon new research in psychology, education, and cognitive science, the authors have demystified a complex topic into clear explanations of seven powerful learning principles. Full of great ideas and practical suggestions, all based on solid research evidence, this book is essential reading for instructors at all levels who wish to improve their students' learning." —Barbara Gross Davis, assistant vice chancellor for educational development, University of California, Berkeley, and author, Tools for Teaching "This book is a must-read for every instructor, new or experienced. Although I have been teaching for almost thirty years, as I read this book I found myself resonating with many of its ideas, and I discovered new ways of thinking about teaching." —Eugenia T. Paulus, professor of chemistry, North Hennepin Community College, and 2008 U.S. Community Colleges Professor of the Year from The Carnegie Foundation for the Advancement of Teaching and the Council for Advancement and Support of Education "Thank you Carnegie Mellon for making accessible what has previously been inaccessible to those of us who are not learning

