Real Sound Synthesis For Interactive Applications

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Designing Sound - Andy Farnell 2010-08-20
A practitioner's guide to the basic principles of creating sound effects using easily accessed free software. Designing Sound teaches students and professional sound designers to understand and create sound effects starting from nothing. Its thesis is that any sound can be generated from first principles, guided by analysis and synthesis. The text takes a practitioner's perspective, exploring the basic principles of making ordinary, everyday sounds using an easily accessed free software. Readers use the Pure Data (Pd) language to construct sound objects, which are more flexible and useful than recordings. Sound is considered as a process, rather than as data—an approach sometimes known as “procedural audio.” Procedural sound is a living sound effect that can run as computer code and be changed in real time according to unpredictable events. Applications include video games, film, animation, and media in which sound is part of an interactive process. The book takes a practical, systematic approach to the subject, teaching by example and providing background information that offers a firm theoretical context for its pragmatic stance. [Many of the examples follow a pattern, beginning with a discussion of the nature and physics of a sound, proceeding through the development of models and the implementation of examples, to the final step of producing a Pure Data program for the desired sound. Different synthesis methods are discussed, analyzed, and refined throughout.] After mastering the techniques presented in Designing Sound, students will be able to build their own sound objects for use in interactive applications and other projects
An Introduction to Music Technology - Dan Hosken 2014-08-01
An Introduction to Music Technology, Second Edition provides a clear overview of the essential elements of music technology for today’s musician. This book focuses on the topics that underlie the hardware and software in use today: Sound, Audio, MIDI, Computer Notation, and Computer- Assisted Instruction. Appendices cover necessary computer hardware and software concepts. Written for both music technology majors and non-majors, this textbook introduces fundamental principles and practices so students can learn to work with a wide range of software programs, adapt to new music technologies, and apply music technology in their performance, composition, teaching, and analysis. Features: Thorough explanations of key topics in music technology Content applicable to all software and hardware, not linked to just one piece of software or gear In-depth discussion of digital audio topics, such as sampling rates, resolutions, and file formats Explanations of standard audio plug-ins including dynamics processors, EQs, and delay based effects Coverage of synthesis and sampling in software instruments Pedagogical features, including: Further Reading sections that allow the student to delve deeper into topics of interest Suggested Activities that can be carried out with a variety of different programs Key Terms at the end of each chapter What Do I Need? Chapters covering the types of hardware and software needed in order to put together Audio and MIDI systems A companion website with links to audio examples that demonstrate various concepts, step-by-step tutorials, relevant hardware, software, and additional audio and video resources. The new edition has been fully updated to cover new technologies that have emerged since the first edition, including iOS and mobile platforms, online notation software, alternate controllers, and Open Sound Control (OSC).
Princeton Alumni Weekly - Author 2001

Advances in Audio and Speech Signal Processing: Technologies and Applications - Perez-Meana, Hector 2007-02-28
"This book provides a comprehensive approach of signal processing tools regarding the enhancement, recognition, and protection of speech and audio signals. It offers researchers and practitioners the information they need to develop and implement efficient signal processing algorithms in the enhancement field"--Provided by publisher.
Audio Processes - David Creasey 2016-09-13
Designed for music technology students, enthusiasts, and professionals, Audio Processes: Musical Analysis, Modification, Synthesis, and Control describes the practical design of audio processes, with a step-by-step approach from basic concepts all the way to sophisticated effects and synthesizers. The themes of analysis, modification, synthesis, and control are covered in an accessible manner and without requiring extensive mathematical skills. The order of material aids the progressive accumulation of understanding, but topics are sufficiently contained that those with prior experience can read individual chapters directly. Extensively supported with block diagrams, algorithms, and audio plots, the ideas and designs are applicable to a wide variety of contexts. The presentation style enables readers to create their own implementations, whatever their preferred programming language or environment. The designs described are practical and extensible, providing a platform for the creation of professional quality results for many different audio applications. There is an accompanying website (www.routledge.com/cw/creasey), which provides further material and examples, to support the book and aid in process development. This book includes: A comprehensive range of audio processes, both popular and less well known, extensively supported with block diagrams and other easily understood visual forms. Detailed descriptions suitable for readers who are new to the subject, and ideas to inspire those with more experience. Designs for a wide range of audio contexts that are easily implemented in visual dataflow environments, as well as conventional programming languages.
Sound Synthesis and Sampling - Martin Russ 2012-11-12
Covers all the major sound synthesis and sampling techniques in an accessible style with detailed diagrams.
Making Musical Apps - Peter Brinkmann 2012-02-17
Want to turn your mobile device into a musical instrument? Or equip your game with interactive audio, rather than canned samples? You can do it with Pure Data (Pd), an open source visual programming environment that lets you manipulate digital audio in real time. This concise book shows you how to use Pd—with help from the libpd library—as an easily embeddable and widely portable sound engine. Whether you’re an audio developer looking to create musical apps with sophisticated audio capabilities, or an application developer ready to enhance mobile games with real-time procedural audio, Making Musical Apps introduces you to Pd and libpd, and provides hands-on instructions for creating musical apps for Android and iOS. Get a crash course in Pd, and discover how to generate and control sounds Learn how to create and deploy algorithmic compositions that react to a user’s activity and environment Use Java or Objective-C to integrate Pd and libpd into mobile apps Learn the steps necessary to build libpd-based apps for Android and iOS
Graphics and Visualization - T. Theoharis 2008-05-30
This book is a comprehensive introduction to visual computing, dealing with the modeling and synthesis of visual data by means of computers. What sets this book apart from other computer graphics texts is the integrated coverage of computer graphics and visualization topics, including important techniques such as subdivision and multi-resolution modeling, scene graphs, shadow generation, ambient occlusion, and scalar and vector data visualization. Students and practitioners will benefit from the comprehensive coverage of the principles that are the basic tools of their trade, from fundamental computer graphics and classic visualization techniques to advanced topics.
Multimedia Programming with Pure Data - Bryan WC Chung 2013-01-01

A quick and comprehensive tutorial book for media designers to jump-start interactive multimedia production with computer graphics, digital audio, digital video, and interactivity, using the Pure Data graphical programming environment.An introductory book on multimedia programming for media artists/designers who like to work on interactivity in their projects, digital art/design students who like to learn the first multimedia programming technique, and audio-visual performers who like to customize their performance sets

The Audio Programming Book - Richard Boulanger 2010-10-22

An encyclopedic handbook on audio programming for students and professionals, with many cross-platform open source examples and a DVD covering advanced topics. This comprehensive handbook of mathematical and programming techniques for audio signal processing will be an essential reference for all computer musicians, computer scientists, engineers, and anyone interested in audio. Designed to be used by readers with varying levels of programming expertise, it not only provides the foundations for music and audio development but also tackles issues that sometimes remain mysterious even to experienced software designers. Exercises and copious examples (all cross-platform and based on free or open source software) make the book ideal for classroom use. Fifteen chapters and eight appendixes cover such topics as programming basics for C and C++ (with music-oriented examples), audio programming basics and more advanced topics, spectral audio programming; programming Csound opcodes, and algorithmic synthesis and music programming. Appendixes cover topics in compiling, audio and MIDI, computing, and math. An accompanying DVD provides an additional 40 chapters, covering musical and audio programs with micro-controllers, alternate MIDI controllers, video controllers, developing Apple Audio Unit plug-ins from Csound opcodes, and audio programming for the iPhone. The sections and chapters of the book are arranged progressively and topics can be followed from chapter to chapter and from section to section. At the same time, each section can stand alone as a self-contained unit. Readers will find The Audio Programming Book a trustworthy companion on their journey through making music and programming audio on modern computers.

Computer Music - Charles Dodge 1985

This text reflects the current state of computer technology and music composition. The authors offer clear, practical overviews of program languages, real-time synthesizers, digital filtering, artificial intelligence, and much more.

Entertainment Computing - ICEC 2004 - Matthias Rauterberg 2004-08-04

The advancement of information and communication technologies (ICT) has enabled broad use of ICT and facilitated the use of ICT in the private and personal domain. ICT-related industries are directing their business targets to home applications. Among these applications, entertainment will differentiate ICT applications in the private and personal market from the of?ce. Comprehensive research and development on ICT - plications for entertainment will be different for the promotion of ICT use in the home and other places for leisure. So far engineering research and development on enterta- ment has never been really established in the academic communities. On the other hand entertainment-related industries such as the video and computer game industries have been growing rapidly in the last 10 years, and today the entertainment computing bu- ness outperforms the turnover of the movie industry. Entertainment robots are drawing theattentionofyoungpeople. TheeventcalledRoboCuphasbeenincreasingthenumber of participants year by year. Entertainment technologies cover a broad range of pr- ucts and services: movies, music, TV (including upcoming interactive TV), VCR, VoD (including music on demand), computer games, game consoles, video arcades, g- bling machines, the Internet (e. g. , chat rooms, board and card games, MUD), intelligent toys, edutainment, simulations, sport, theme parks, virtual reality, and upcoming service robots.

The?eldofentertainmentcomputingfocusesonusers'growinguseofentertainment technologies at work, in school and at home, and the impact of this technology on their behavior. Nearly every working and living place has computers, and over two-thirds of childreninindustrializedcountrieshavecomputersintheirhomesaswell.

Game Sound Technology and Player Interaction: Concepts and Developments - Grimshaw, Mark 2010-09-30

Game Sound Technology and Player Interaction: Concepts and Developments researches both how game sound affects a player psychologically, emotionally, and physiologically, and how this relationship itself impacts the design of computer game sound and the development of technology. This compilation also applies beyond the realm of video games to other types of immersive sound, such as soundscape design, gambling machines, emotive and fantastical sound to name a few. The application for this research is wide-ranging, interdisciplinary, and of primary importance for academics and practitioners searching for the right sounds.

Real Sound Synthesis for Interactive Applications - Perry R. Cook 2002-07-01

Virtual environments such as games and animated and "real" movies require realistic sound effects that can be integrated by computer synthesis. The book emphasizes physical modeling of sound and focuses on real-world interactive sound effects. It is intended for game developers, graphics programmers, developers of virtual reality systems and traini

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Music Technology and the Project Studio - Dan Hosken 2012-03-15

Music Technology and the Project Studio: Synthesis and Sampling provides clear explanations of synthesis and sampling techniques and how to use them effectively and creatively. Starting with analog-style synthesis as a basic model, this textbook explores in detail how messages from a MIDI controller or sequencer are used to control elements of a synthesizer to create rich, dynamic sound. Since samplers and sample players are also common in today's software, the book explores the details of sampling and the control of sampled instruments with MIDI messages. This book is not limited to any specific software and is general enough to apply to many different software instruments. Overviews of sound and digital audio provide students with a set of common concepts used throughout the text, and "Technically Speaking" sidebars offer detailed explanations of advanced technical concepts, preparing students for future studies in sound synthesis. Music Technology and the Project Studio: Synthesis and Sampling is an ideal follow-up to the author's An Introduction to Music Technology, although each book can be used independently. The Companion Website includes: Audio examples demonstrating synthesis and sampling techniques Interactive software that allows the reader to experiment with various synthesis techniques Guides relating the material in the book to various software synthesizers and samplers Links to relevant resources, examples, and software

Sonic Interactions in Virtual Environments - Michele Geronazzo 2023

This open access book tackles the design of 3D spatial interactions in an audio-centered and audio-first perspective, providing the fundamental notions related to the creation and evaluation of immersive sonic experiences. The key elements that enhance the sensation of place in a virtual environment (VE) are: Immersive audio: the computational aspects of the acoustical-space properties of Virutal Reality (VR) technologies Sonic interaction: the human-computer interplay through auditory feedback in VE VR systems: naturally support multimodal integration, impacting different application domains Sonic Interactions in Virtual Environments will feature state-of-the-art research on real-time auralization, sonic interaction design in VR, quality of the experience in multimodal scenarios, and applications. Contributors and editors include interdisciplinary experts from the fields of computer science,

engineering, acoustics, psychology, design, humanities, and beyond. Their mission is to shape an emerging new field of study at the intersection of sonic interaction design and immersive media, embracing an archipelago of existing research spread in different audio communities and to increase among the VR communities, researchers, and practitioners, the awareness of the importance of sonic elements when designing immersive environments.

Audio Anecdotes - Ken Greenebaum 2004-03-11

Audio Anecdotes is a book about digital sound. It discusses analyzing, processing, creating, and recording many forms of sound and music, emphasizing the opportunities presented by digital media made possible by the arrival of inexpensive and nearly ubiquitous digital computing equipment. Applications of digital audio techniques are indispensable i

Image Pattern Recognition -

Programming for Musicians and Digital Artists - Spencer Salazar 2014-12-23

Summary Programming for Musicians and Digital Artists: Creating Music with ChucK offers a complete introduction to programming in the open source music language ChucK. In it, you'll learn the basics of digital sound creation and manipulation while you discover the ChucK language. As you move example-by-example through this easy-to-follow book, you'll create meaningful and rewarding digital compositions and "instruments" that make sound and music in direct response to program logic, scores, gestures, and other systems connected via MIDI or the network. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About this Book A digital musician must manipulate sound precisely. ChucK is an audio-centric programming language that provides precise control over time, audio computation, and user interface elements like track pads and joysticks. Because it uses the vocabulary of sound, ChucK is easy to learn even for artists with little or no exposure to computer programming. Programming for Musicians and Digital Artists offers a complete introduction to music programming. In it, you'll learn the basics of digital sound manipulation while you learn to program using ChucK. Example-by-example, you'll create meaningful digital compositions and "instruments" that respond to program logic, scores, gestures, and other systems connected via MIDI or the network. You'll also experience how ChucK enables the on-the-fly musical improvisation practiced by communities of "live music coders" around the world. Written for readers familiar with the vocabulary of sound and music. No experience with computer programming is required. What's Inside Learn ChucK and digital music creation side-by-side Invent new sounds, instruments, and modes of performance Written by the creators of the ChucK language About the Authors Perry Cook, Ajay Kapur, Spencer Salazar, and Ge Wang are pioneers in the area of teaching and programming digital music. Ge is the creator and chief architect of the ChucK language. Table of Contents Introduction: ChucK programming for artistsPART 1 INTRODUCTION TO PROGRAMMING IN CHUCK Basics: sound, waves, and ChucK programming Libraries: ChucK's built-in tools Arrays: arranging and accessing your compositional data Sound files and sound manipulation Functions: making your own tools PART 2 NOW IT GETS REALLY INTERESTING! Unit generators: ChucK objects for sound synthesis and processing Synthesis ToolKit instruments Multithreading and concurrency: running many programs at once Objects and classes: making your own ChucK power tools Events: signaling between shreds and syncing to the outside world Integrating with other systems via MIDI, OSC, serial, and more

Real Sound Synthesis for Interactive Applications - Perry R. Cook 2017-07-27

Virtual environments such as games and animated and "real" movies require realistic sound effects that can be integrated by computer synthesis. The book emphasizes physical modeling of sound and focuses on real-world interactive sound effects. It is intended for game developers, graphics programmers, developers of virtual reality systems and training simulators, and others who want to learn about computational sound. It is written at an introductory level with mathematical foundations provided in appendices. Links to code examples and sound files can be found on the Downloads/Updates tab.

Introduction to Computer Music - Nick Collins 2010-02-01

A must-have introduction that bridges the gap between music and computing The rise in number of composer-programmers has given cause for an essential resource that addresses the gap between music and computing and looks at the many different software packages that deal with music technology. This up-to-date book fulfills that demand and deals with both the practical use of technology in music as well as the principles behind the discipline. Aimed at musicians exploring computers and technologists engaged with music, this unique guide merges the two worlds so that both musicians and computer scientists can benefit. Defines computer music and offers a solid introduction to representing music on a computer Examines computer music software, the musical instrument digital interface, virtual studios, file formats, and more Shares recording tips and tricks as well as exercises at the end of each section to enhance your learning experience Reviews sound analysis, processing, synthesis, networks, composition, and modeling Assuming little to no prior experience in computer programming, this engaging book is an ideal starting point for discovering the beauty that can be created when technology and music unite.

Small Tech - Byron Hawk 2008-01

The essays in Small Tech investigate the cultural impact of digital tools and provide fresh perspectives on mobile technologies such as iPods, digital cameras, and PDAs and software functions like cut, copy, and paste and WYSIWYG. Together they advance new thinking about digital environments. Contributors: Wendy Warren Austin, Edinboro U; Jim Bizzocchi, Simon Fraser U; Collin Gifford Brooke, Syracuse U; Paul Cesarini, Bowling Green State U; Veronique Chance, U of London; Johanna Drucker, U of Virginia; Jenny Edbauer, Penn State U; Robert A. Emmons Jr., Rutgers U; Johndan Johnson-Eilola, Clarkson U; Richard Kahn, UCLA; Douglas Kellner, UCLA; Karla Saari Kitalong, U of Central Florida; Steve Mann, U of Toronto; Lev Manovich, U of California, San Diego; Adrian Miles, RMIT U; Jason Nolan, Ryerson U; Julian Oliver; Mark Paterson, U of the West of England, Bristol; Isabel Pedersen, Ryerson U; Michael Pennell, U of Rhode Island; Joanna Castner Post, U of Central Arkansas; Teri Rueb, Rhode Island School of Design; James J. Sosnoski; Lance State, Fordham U; Jason Swarts, North Carolina State U; Barry Wellman, U of Toronto; Sean D. Williams, Clemson U; Jeremy Yuille, RMIT U. Byron Hawk is assistant professor of English at George Mason University. David M. Rieder is assistant professor of English at North Carolina State University. Ollie Oviedo is associate professor of English at Eastern New Mexico University.

Numerical Sound Synthesis - Stefan Bilbao 2009-09-03

Digital sound synthesis has long been approached using standard digital filtering techniques. Newer synthesis strategies, however, make use of physical descriptions of musical instruments, and allow for much more realistic and complex sound production and thereby synthesis becomes a problem of simulation. This book has a special focus on time domain finite difference methods presented within an audio framework. It covers time series and difference operators, and basic tools for the construction and analysis of finite difference schemes, including frequency-domain and energy-based methods, with special attention paid to problems inherent to sound synthesis. Various basic lumped systems and excitation mechanisms are covered, followed by a look at the 1D wave equation, linear bar and string vibration, acoustic tube modelling, and linear membrane and plate vibration. Various advanced topics, such as the nonlinear vibration of strings and plates, are given an elaborate treatment. Key features: Includes a historical overview of digital sound synthesis techniques, highlighting the links between the various physical modelling methodologies. A pedagogical presentation containing over 150 problems and programming exercises, and numerous figures and diagrams, and code fragments in the MATLAB® programming language helps the reader with limited experience of numerical methods reach an understanding of this subject. Offers a complete treatment of all of the major families of musical instruments, including certain audio effects. Numerical Sound Synthesis is suitable for audio and software engineers, and researchers in digital audio, sound synthesis and more general musical acoustics. Graduate students in electrical engineering, mechanical engineering or computer science, working on the more technical side of digital audio and sound synthesis, will also find this book of interest.

Sounding Out: Pauline Oliveros and Lesbian Musicality - Martha Mockus 2011-05-20

Sounding Out: Pauline Oliveros and Lesbian Musicality examines the musical career of the avant-garde composer, accordionist, whose radical innovations of the 1960s, 70s and 80s have redefined the aesthetic and formal parameters of American experimental music. While other scholars have studied Oliveros as a disciple of John Cage and a contemporary of composers Terry Riley, Lou Harrison, Gordon Mumma, and Robert Ashley, Sounding Out resituates Pauline Oliveros in a gynecentric network of feminist activists, writers, artists and musicians. This book shows how the women in Oliveros’s life were central sources of creative

energy and exchange during a crucial moment in feminist and queer cultural history. Crafting a dynamic relationship between feminism and music-making, this book offers a queerly original analysis of Oliveros's work as a musical form of feminist activism and argues for the productive role of experimental music in lesbian feminist theory. Sounding Out combines key elements of feminist theories of lesbian sexuality with Oliveros's major compositions, performances, critical essays, and interviews. It also includes previously unpublished correspondence between Oliveros and Edith Guttierez, Jill Johnston, Annea Lockwood, Kate Millett, and Jane Rule.

Web Audio API - Boris Smus 2013

Go beyond HTML5's Audio tag and boost the audio capabilities of your web application with the Web Audio API. Packed with lots of code examples, crisp descriptions, and useful illustrations, this concise guide shows you how to use this JavaScript API to make the sounds and music of your games and interactive applications come alive. You need little or no digital audio expertise to get started. Author Boris Smus introduces you to digital audio concepts, then shows you how the Web Audio API solves specific application audio problems. If you're an experienced JavaScript programmer, you'll not only learn how to synthesize and process digital audio, you'll also explore audio analysis and visualization with this API. Learn Web Audio API, including audio graphs and the audio nodes Provide quick feedback to user actions by scheduling sounds with the API's precise timing model Control gain, volume, and loudness, and dive into clipping and crossfading Understand pitch and frequency: use tools to manipulate soundforms directly with JavaScript Generate synthetic sound effects and learn how to spatialize sound in 3D space Use Web Audio API with the Audio tag, getUserMedia, and the Page Visibility API

Refining Sound - Brian K. Shepard 2013-10

Refining Sound is a practical roadmap to the complexities of creating sounds on modern synthesizers. As author, veteran synthesizer instructor Brian K. Shepard draws on his years of experience in synthesizer pedagogy in order to peel back the often-mysterious layers of sound synthesis one-by-one. The result is a book which allows readers to familiarize themselves with each individual step in the synthesis process, in turn empowering them in their own creative or experimental work. The book follows the stages of synthesis in chronological progression, starting readers at the raw materials of sound creation and ultimately bringing them to the final "polishing" stage. Each chapter focuses on a particular aspect of the synthesis process, culminating in a last chapter that brings everything together as the reader creates his/her own complex sounds. Throughout the text, the material is supported by copious examples and illustrations as well as by audio files and synthesis demonstrations on a related companion website. Each chapter contains easily digestible guided projects (entitled "Your Turn" sections) that focus on the topics of the corresponding chapter. In addition to this, one complete project will be carried through each chapter of the book cumulatively, allowing the reader to follow - and build - a sound from start to finish. The final chapter includes several sound creation projects in which readers are given types of sound to create as well as some suggestions and tips, with final outcomes is left to readers' own creativity. Perhaps the most difficult aspect of learning to create sounds on a synthesizer is to understand exactly what each synthesizer component does independent of the synthesizer's numerous other components. Not only does this book thoroughly illustrate and explain these individual components, but it also offers numerous practical demonstrations and exercises that allow the reader to experiment with and understand these elements without the distraction of the other controls and modifiers. Refining Sound is essential for all electronic musicians from amateur to professional levels of accomplishment, students, teachers, libraries, and anyone interested in creating sounds on a synthesizer.

Music Apps for Musicians and Music Teachers - Elizabeth C. Axford 2015-02-19

In today's digital age, learning and creating music has never been so easy and affordable. Anyone can enhance their musical knowledge, skills, and creativity with the multitude of music apps available. However, sifting through thousands of music apps in the Apple App Store and Google Play can be a daunting task for any musician or music instructor. But not anymore! Having spent countless hours researching the most interesting useful, educational, fun, and easy-to-use music apps, Elizabeth C. Axford in Music Apps for Musicians and Music Teachers surveys the landscape of music-related apps for both iOS and Android mobile devices, including tablets and smartphones. Music Apps for Musicians and Music Teachers lists hundreds of music-related apps organized by category, including singing, musical instruments, music theory and composition, songwriting, improvisation, recording, evaluating music performances, listening to music, music history and literature, music appreciation, and more. App developers are listed with each app, including links to their websites for updates and support. The book sections and chapters align with the newly revised National Standards for Music Education released in 2014 by the National Association for Music Education. Suggested activities for educators are provided, as well as key terms and a bibliography. Music Apps for Musicians and Music Teachers is for anyone interested in music, whether hobbyist or professional. It enhances the ability to learn on the go by offering musicians, music students, and music instructors a list of the most useful music apps available.

A NIME Reader - Alexander Refsum Jensenius 2017-03-06

What is a musical instrument? What are the musical instruments of the future? This anthology presents thirty papers selected from the fifteen year long history of the International Conference on New Interfaces for Musical Expression (NIME). NIME is a leading music technology conference, and an important venue for researchers and artists to present and discuss their explorations of musical instruments and technologies. Each of the papers is followed by commentaries written by the original authors and by leading experts. The volume covers important developments in the field, including the earliest reports of instruments like the reacTable, Overtone Violin, Pebblebox, and Plank. There are also numerous papers presenting new development platforms and technologies, as well as critical reflections, theoretical analyses and artistic experiences. The anthology is intended for newcomers who want to get an overview of recent advances in music technology. The historical traces, meta-discussions and reflections will also be of interest for longtime NIME participants. The book thus serves both as a survey of influential past work and as a starting point for new and exciting future developments.

The Oxford Handbook of Interactive Audio - Karen Collins 2014

What does it mean to interact with sound? How does interactivity alter our experience as creators and listeners? What does the future hold for interactive musical and sonic experiences? This book answers these questions with newly-commissioned chapters that explore the full range of interactive audio in games, performance, design, and practice.

Practical Algorithms for 3D Computer Graphics, Second Edition - R. Stuart Ferguson 2013-12-19

Practical Algorithms for 3D Computer Graphics, Second Edition covers the fundamental algorithms that are the core of all 3D computer graphics software packages. Using Core OpenGL and OpenGL ES, the book enables you to create a complete suite of programs for 3D computer animation, modeling, and image synthesis. Since the publication of the first edition, implementation aspects have changed significantly, including advances in graphics technology that are enhancing immersive experiences with virtual reality. Reflecting these considerable developments, this second edition presents up-to-date algorithms for each stage in the creative process. It takes you from the construction of polygonal models of real and imaginary objects to rigid body animation and hierarchical character animation to the rendering pipeline for the synthesis of realistic images. New to the Second Edition New chapter on the modern approach to real-time 3D programming using OpenGL New chapter that introduces 3D graphics for mobile devices New chapter on OpenFX, a comprehensive open source 3D tools suite for modeling and animation Discussions of new topics, such as particle modeling, marching cubes, and techniques for rendering hair and fur More web-only content, including source code for the algorithms, video transformations, comprehensive examples, and documentation for OpenFX The book is suitable for newcomers to graphics research and 3D computer games as well as more experienced software developers who wish to write plug-in modules for any 3D application program or shader code for a commercial games engine.

The Cambridge Companion to Electronic Music - Nick Collins 2017-11-09

Now updated and expanded with four new chapters, this book explores the history, theory, creation and analysis of electronic music.

Sound Synthesis, Propagation, and Rendering - Shiguang Liu 2022-03-24

This book gives a broad overview of research on sound simulation driven by a variety of applications. Vibrating objects produce sound, which then propagates through a medium such as air or water before finally being heard by a listener. As a crucial sensory channel, sound plays a vital role

in many applications. There is a well-established research community in acoustics that has studied the problems related to sound simulation for six decades. Some of the earliest work was motivated by the design of concert halls, theaters, or lecture rooms with good acoustic characteristics. These problems also have been investigated in other applications, including noise control and sound design for urban planning, building construction, and automotive applications. Moreover, plausible or realistic sound effects can improve the sense of presence in a virtual environment or a game. In these applications, sound can provide important clues such as source directionality and spatial size. The book first surveys various sound synthesis methods, including harmonic synthesis, texture synthesis, spectral analysis, and physics-based synthesis. Next, it provides an overview of sound propagation techniques, including wave-based methods, geometric-based methods, and hybrid methods. The book also summarizes various techniques for sound rendering. Finally, it surveys some recent trends, including the use of machine learning methods to accelerate sound simulation and the use of sound simulation techniques for other applications such as speech recognition, source localization, and computer-aided design.

Sound to Sense, Sense to Sound - Pietro Polotti 2008

Since the 1950s, Sound and Music Computing (SMC) research has had a profound impact on the development of culture and technology in our post-industrial society. SMC research approaches the whole sound and music communication chain from a multidisciplinary point of view. By combining scientific, technological and artistic methodologies it aims at understanding, modeling, representing and producing sound and music using computational approaches. This book, by describing the state of the art in SMC research, gives hints of future developments, whose general purpose will be to bridge the semantic gap, the hiatus that currently separates sound from sense and sense from sound.

Sound Synthesis and Sampling - Martin Russ 2012-08-21

Sound Synthesis and Sampling' provides a comprehensive introduction to the underlying principles and practical techniques applied to both commercial and research sound synthesizers. This new edition has been updated throughout to reflect current needs and practices- revised and placed in a modern context, providing a guide to the theory of sound and sampling in the context of software and hardware that enables sound making. For the revised edition emphasis is on expanding explanations of software and computers, new sections include techniques for making sound physically, sections within analog and digital electronics. Martin Russ is well known and the book praised for its highly readable and non-mathematical approach making the subject accessible to readers starting out on computer music courses or those working in a studio.

Microaggressions and Marginality - Derald Wing Sue 2010-07-26

A landmark volume exploring covert bias, prejudice, and discrimination with hopeful solutions for their eventual dissolution Exploring the psychological dynamics of unconscious and unintentional expressions of bias and prejudice toward socially devalued groups, Microaggressions and Marginality: Manifestation, Dynamics, and Impact takes an unflinching look at the numerous manifestations of these subtle biases. It thoroughly deals with the harm engendered by everyday prejudice and discrimination, as well as the concept of microaggressions beyond that of race and expressions of racism. Edited by a nationally renowned expert in the field of multicultural counseling and ethnic and minority issues, this book features contributions by notable experts presenting original research and scholarly works on a broad spectrum of groups in our society who have traditionally been marginalized and disempowered. The definitive source on this topic, Microaggressions and Marginality features: In-depth chapters on microaggressions towards racial/ethnic, international/cultural, gender, LGBT, religious, social, and disabled groups Chapters on racial/ethnic microaggressions devoted to specific populations including African Americans, Latino/Hispanic Americans, Asian Americans, indigenous populations, and biracial/multiracial people A look at what society must do if it is to reduce prejudice and discrimination directed at these groups Discussion of the common dynamics of covert and unintentional biases Coping strategies enabling targets to survive such onslaughts Timely and thought-provoking, Microaggressions and Marginality is essential reading for any professional dealing with diversity at any level, offering guidance for facing and opposing microaggressions in today's society.

DAFX - Udo Zölzer 2011-03-16

The rapid development in various fields of Digital Audio Effects, or DAFX, has led to new algorithms and this second edition of the popular book, DAFX: Digital Audio Effects has been updated throughout to reflect progress in the field. It maintains a unique approach to DAFX with a lecture-style introduction into the basics of effect processing. Each effect description begins with the presentation of the physical and acoustical phenomena, an explanation of the signal processing techniques to achieve the effect, followed by a discussion of musical applications and the control of effect parameters. Topics covered include: filters and delays, modulators and demodulators, nonlinear processing, spatial effects, time-segment processing, time-frequency processing, source-filter processing, spectral processing, time and frequency warping musical signals. Updates to the second edition include: Three completely new chapters devoted to the major research areas of: Virtual Analog Effects, Automatic Mixing and Sound Source Separation, authored by leading researchers in the field . Improved presentation of the basic concepts and explanation of the related technology. Extended coverage of the MATLABTM scripts which demonstrate the implementation of the basic concepts into software programs. Companion website (www.dafx.de) which serves as the download source for MATLABTM scripts, will be updated to reflect the new material in the book. Discussing DAFX from both an introductory and advanced level, the book systematically introduces the reader to digital signal processing concepts, how they can be applied to sound and their use in musical effects. This makes the book suitable for a range of professionals including those working in audio engineering, as well as researchers and engineers involved in the area of digital signal processing along with students on multimedia related courses.

The Harvard Dictionary of Music - Don Michael Randel 2014-03-05

This classic reference work, the best one-volume music dictionary available, has been brought completely up to date in this new edition. Combining authoritative scholarship and lucid, lively prose, the Fourth Edition of The Harvard Dictionary of Music is the essential guide for musicians, students, and everyone who appreciates music.

Audio Anecdotes III - Ken Greenebaum 2007-11-29

This collection of articles provides practical and relevant tools, tips, and techniques for those working in the digital audio field. Volume III, with contributions from experts in their fields, includes articles on a variety of topics, including: - Recording Music - Sound Synthesis - Voice Synthesis - Speech Processing - Applied Signal Processing

Introduction to Digital Signal Processing - Tae Hong Park 2010

"This book offers an introduction to digital signal processing (DSP) with an emphasis on audio signals and computer music ... This book is designed for both technically and musically inclined readers alike--folks with a common goal of exploring digital signal processing"--Cover, p. [4].