The Audio Programming Book

Comprehensive summary of the conventions, treaties and agreements administered by the World Intellectual Property Organization.

Designing Audio Effect Plugins in C++presents everything you need to know about digital signal processing in an accessible way. Not just another theory-heavy digital signal processing book, nor another dull build-a-generic-database programming book, this book includes fully worked, downloadable code for dozens of professional audio effect plugins and practically presented algorithms. Sections include the basics of audio signal processing, the anatomy of a plugin, AAX, AU and VST3 programming guides; implementation details; and actual projects and code. More than 50 fully coded C++ audio signal-processing objects are included. Start with an intuitive and practical introduction to the digital signal processing (DSP) theory behind audio plug-ins, and quickly move on to plugin implementation, gain knowledge of algorithms on classical, virtual analog, and wave digital filters, delay, reverb, modulated effects, dynamics processing, pitch shifting, nonlinear processing, sample rate conversion and more. You will then be ready to design and implement your own unique plugins on any platform and within almost any host program. This new edition is fully updated and improved and presents a plugin core that allows readers to move freely between application programming interfaces and platforms. Readers are expected to have some knowledge

of C++ and high school math. essing, sample rate conversion and more. You will then be ready to design and implement your own unique plugins on any platform and within almost any host program. This new edition is fully updated and improved and presents a plugin core that allows readers to move freely between application programming interfaces and platforms. Readers are expected to have some knowledge of C++ and high school math.

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.

Please note that the content of this book primarily consists of articles available from Wikipedia or other free sources online. Pages: 28. Chapters: Audio programming language, Bidule, ChucK, CMusic, Common Lisp Music, Comparison of audio synthesis environments, Csound, FAUST (programming language), Harmony Compiler, Hierarchical Music Specification Language, Impromptu (programming environment), JFugue, JMusic, JSyn, Keykit, Kyma (sound design language), Mathematica, Max (software), MUSIC-N, Music Macro Language, Nyquist (programming language), OpenMusic, Orchidee (software), Pure Data, Real-time Cmix, Sound Object (SndObj) Library, Structured Audio Orchestra Language, SuperCollider, Synthesis Toolkit, Unit

generator, Usine. Excerpt: Mathematica is a computational software program used in scientific, engineering, and mathematical fields and other areas of technical computing. It was conceived by Stephen Wolfram and is developed by Wolfram Research of Champaign, Illinois. Dini's surface plotted with adjustable parametersFeatures of Mathematica include: Mathematica also has some notable omissions, particularly the lack of as-you-type spellchecking of text, and multi-level undo. Mathematica is split into two parts, the kernel and the front end. The kernel interprets expressions (Mathematica code) and returns result expressions. The front end, designed by Theodore Gray, provides a GUI, which allows the creation and editing of Notebook documents containing program code with prettyprinting, formatted text together with results including typeset mathematics, graphics, GUI components, tables, and sounds. All contents and formatting can be generated algorithmically or interactively edited. Most standard word processing capabilities are supported, but there is only one level of "undo." It includes a spell-checker but does not spell check automatically as you type. Documents can be structured using a hierarchy of cells, which allow for outlining and sectioning of a...

This book is a standard tutorial targeted at game developers which aims to help them incorporate audio programming techniques to enhance their gameplay experience.This book is perfect for C++ game developers who have no experience with audio programming and who would like a quick introduction to the most important topics

required to integrate audio into a game.

The professional recording industry is rapidly moving from a hardware paradigm (big studios with expensive gear) to a software paradigm, in which lots of expensive hardware is replaced with a single computer loaded with software plug-ins. Complete albums are now being recorded and engineered "inside the box"-all within a computer without hardware processing or mixing gear. Audio effect plug-ins, which are small software modules that work within audio host applications, like Avid Pro Tools, Apple Logic, Ableton Live, and Steinberg Cubase, are big business. Designing Audio Effect Plug-Ins in C++ gives readers everything they need to know to create real-world, working plug-ins in the widely used C++ programming language. Beginning with the necessary theory behind audio signal processing, author Will Pirkle quickly gets into the heart of this implementation guide, with clearly-presented, previously unpublished algorithms, tons of example code, and practical advice. From the companion website, readers can download free software for the rapid development of the algorithms, many of which have never been revealed to the general public. The resulting plug-ins can be compiled to snap in to any of the above host applications. Readers will come away with the knowledge and tools to design and implement their own audio signal processing designs. Learn to build audio effect plug-ins in a widely used, implementable programming language-C++ Design plug-ins for a variety of platforms (Windows and Mac) and popular audio applications Companion site gives you fully worked-out code

for all the examples used, free development software for download, video tutorials for the software, and examples of student plug-ins complete with theory and code Digital Audio Theory: A Practical Guide bridges the fundamental concepts and equations of digital audio with their real-world implementation in an accessible introduction, with dozens of programming examples and projects. Starting with digital audio conversion, then segueing into filtering, and finally real-time spectral processing, Digital Audio Theory introduces the uninitiated reader to signal processing principles and techniques used in audio effects and virtual instruments that are found in digital audio workstations. Every chapter includes programming snippets for the reader to hear, explore, and experiment with digital audio concepts. Practical projects challenge the reader, providing hands-on experience in designing real-time audio effects, building FIR and IIR filters, applying noise reduction and feedback control, measuring impulse responses, software synthesis, and much more. Music technologists, recording engineers, and students of these fields will welcome Bennett's approach, which targets readers with a background in music, sound, and recording. This guide is suitable for all levels of knowledge in mathematics, signals and systems, and linear circuits. Code for the programming examples and accompanying videos made by the author can be found on the companion website, DigitalAudioTheory.com.

The Audio Programming BookMIT Press

This book is a fast-paced, practical guide full of step-by-step examples which are

easy to follow and implement.This book is for programmers with a basic grasp of C++. The examples start at a basic level, making few assumptions beyond fundamental C++ concepts. Those without any experience with C++ should be able to follow and construct the examples, although you may need further support to understand the fundamental concepts.

"Designing Software Synthesizer Plugins in C++ provides everything you need to know to start designing and writing your own synthesizer plugins, including theory and practical examples for all of the major synthesizer building blocks from LFOs and EGs to PCM samples and morphing wavetables, along with complete synthesizer example projects. The book and accompanying SynthLab projects include scores of C++ objects and functions that implement the synthesizer building blocks, and six synthesizer projects ranging from virtual analog and physical modelling to wavetable morphing and wave-sequencing that demonstrate their use. You can start using the book immediately with the SynthLab-DM product that allows you to compile and load mini-modules that resemble modular synth components, without needing to maintain the complete synth project code. The C++ objects all run in a standalone mode, so you can incorporate them into your current projects or whip up a quick experiment. All six synth projects are fully documented from the tiny SynthClock up to the

SynthEngine objects allowing you to get the most from the book while working at a level that you feel comfortable with. This book is intended for music technology and engineering students along with DIY audio programmers and anyone wanting to understand how synthesizers may be implemented in C++"-- ????????????, ??, ???????, ??????????????, ????????, ????????????, ???????;????????, ??????????, ???????, ???????.

An all-in-one introduction to implementing sound, this guide provides a comprehensive practical resource for programmers. Tim Kientzle, technical editor of "Dr. Dobb's Journal", presents the basic principles of sound and sound processing, together with concrete implementation details for a variety of sound file formats and algorithms. The CD-ROM includes royalty-free sound libraries and a rich collection of utilities.

A guide to developing audio and process control applications with Java covers user interfaces, sound processing and filtering, and audio control sources 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

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Designing Software Synthesizer Plugins in C++ provides everything you need to know to start designing and writing your own synthesizer plugins, including theory and practical examples for all of the major synthesizer building blocks, from LFOs and EGs to PCM samples and morphing wavetables, along with complete synthesizer example projects. The book and accompanying SynthLab projects include scores of C++ objects and functions that implement the synthesizer building blocks as well as six synthesizer projects, ranging from virtual analog and physical modelling to wavetable morphing and wave-sequencing that demonstrate their use. You can start using the book immediately with the SynthLab-DM product, which allows you to compile and load mini-modules that resemble modular synth components without needing to maintain the complete synth project code. The C++ objects all run in a stand-alone mode, so you can incorporate them into your current projects or whip up a quick experiment. All six synth projects are fully documented, from the tiny SynthClock to the SynthEngine objects, allowing you to get the most from the book while working at a level that you feel comfortable with. This book is intended for music technology and engineering students, along with DIY audio programmers and anyone wanting to understand how synthesizers may be implemented in C++.

This rigorous book is a complete and up-to-date reference for the Csound system from the

perspective of its main developers and power users. It explains the system, including the basic modes of operation and its programming language; it explores the many ways users can interact with the system, including the latest features; and it describes key applications such as instrument design, signal processing, and creative electronic music composition. The Csound system has been adopted by many educational institutions as part of their undergraduate and graduate teaching programs, and it is used by practitioners worldwide. This book is suitable for students, lecturers, composers, sound designers, programmers, and researchers in the areas of music, sound, and audio signal processing.

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.
Martin Wilde's cutting-edge exploration of the creative potential of game audio systems addresses the latest working methods of those involved in creating and programming immersive, interactive and non-linear audio for games. The book demonstrates how the game programmer can create an software system which enables the audio content provider (composer/sound designer) to maintain direct control over the composition and presentation of an interactive game soundtrack. This system (which is platform independent) is described step-by-step in Wilde's approachable style with illuminating case studies, all source codes for which are provided on the accompanying CD-Rom which readers can use to develop their own audio engines. As a programmer with experience of developing sound and music software engines for computer game titles on a multitude of platforms who is also an experienced musician, Martin Wilde is uniquely placed to address individuals approaching game audio from various levels and areas of expertise. Game audio programmers will learn how to achieve enable even better audio soundtracks and effects, while musicians who want to capitalise on this shift in roles will gain a greater appreciation of the technical issues involved, so enhancing their employment prospects. Students of game design can practice these skills by building their own game audio engines based on the source code provided.

? 55% OFF for Bookstores! Now at $ 42.99 instead of $ 52.99 ? What about a computer programming language created specifically for kids to accelerate their coding career and have fun at the same time? Does your kid enjoy spending time in front of the computer? Your Customers Will Never Stop to Use This Awesone Scratch Programming Book! This book is designed for you because it explains how kids can learn to program using Scratch, a programming language in which anyone can create cartoons, make music, and develop new games! This is especially appropriate for kids, who can learn computer coding at an early age and become interested in the world of technology. Enhance your kid's talents and passions! Computer programming is one of the best options I know! Every kid should learn one of the most in-demand skills! "Coding for Kids Scratch" includes Master coding fundamentals in a simple and engaging way The best way to start with Scratch programming Games, animations, and audio programming - the most fascinating chapters! More Advanced Concepts about coding with Scratch How to make Scratch even more fun and engaging How to avoid errors? Much much more... Your kid can start learning this language with absolutely Zero Programming or Coding experience! This book will take him by the hand and guide him through every single step! Buy it NOW and let your customers get addicted to this amazing Scratch programming book

"This is Volume 3 in a sequential series of bi-annual volumes, with each volume comprised of 20-25 chapters written by game audio programmers and sound designers. Basic to advanced knowledge of programming and audio integration techniques is presented. One of the goals of this book is to raise the general level of game audio programming expertise, so it is written in a manner that is accessible to beginners, while still providing valuable content for more

advanced game audio programmers. The authors of the chapters will have used all of the techniques in shipping games, so readers will learn about techniques that are actually practical, with plenty of code examples and diagrams"--

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Audio can affect the human brain in the most powerful and profound ways. Using Apple's Core Audio, you can leverage all that power in your own Mac and iOS software, implementing features ranging from audio capture to real-time effects, MP3 playback to virtual instruments, web radio to VoIP support. The most sophisticated audio programming system ever created, Core Audio is not simple. In Learning Core Audio , top Mac programming author Chris Adamson and legendary Core Audio expert Kevin Avila fully explain this challenging framework, enabling experienced Mac or iOS programmers to make the most of it. In plain language, Adamson and Avila explain what Core Audio can do, how it works, and how it builds on the natural phenomena of sound and the human language of audio. Next, using crystal-clear code examples, they guide you through recording, playback, format conversion, Audio Units, 3D audio MIDI connectivity, and overcoming unique challenges of Core Audio

programming for iOS. Coverage includes: mastering Core Audio's surprising style and conventions; recording and playback with Audio Queue; synthesizing audio; perform effects on audio streams; capturing from the mic; mixing multiple streams; managing file streams; converting formats; creating 3D positional audio; using Core MIDI on the Mac; leveraging your Cocoa and Objective-C expertise in Core Audio's C-based environment, and much more. When you've mastered the "black arts" of Core Audio, you can do some serious magic. This book will transform you from an acolyte into a true Core Audio wizard.
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Bridging the gap from theory to programming, Designing Software Synthesizer Plug-Ins in C++ For RackAFX, VST3 and Audio Units contains complete code for designing and implementing software synthesizers for both Windows and Mac platforms. You will learn synthesizer operation, starting with the underlying theory of each synthesizer component, and moving on to the theory of how these components combine to form fully working musical instruments that function on a variety of target digital audio workstations (DAWs). Containing some of the latest advances in theory and algorithm development, this book contains information that has never been published in textbook form, including several unique algorithms of the author's own design. The book is broken into three parts: plug-in programming, theory and design of the central synthesizer components of oscillators, envelope generators, and filters, and the design and implementation of six complete polyphonic software synthesizer musical instruments, which can be played in real time. The instruments implement advanced concepts including a user-programmable modulation matrix. The final chapter shows you the theory and code for a suite of delay effects to augment your synthesizers, introducing you to audio effect processing.

The companion website, www.focalpress.com/cw/pirkle, gives you access to free software to guide you through the application of concepts discussed in the book, and code for both Windows and Mac platforms. In addition to the software, it features bonus projects, application notes, and video tutorials. A reader forum, monitored by the author, gives you the opportunity for questions and information exchange.

Welcome to the second volume of Game Audio Programming: Principles and Practices – the first series of its kind dedicated to the art of game audio programming! This volume features more than 20 chapters containing advanced techniques from some of the top game audio programmers and sound designers in the industry. This book continues the tradition of collecting more knowledge and wisdom about game audio programming than any other volume in history. Both audio programming beginners and seasoned veterans will find content in this book that is valuable, with topics ranging from extreme low-level mixing to high-level game integration. Each chapter contains techniques that were used in games that have shipped, and there is a plethora of code samples and diagrams. There are chapters on threading, DSP implementation, advanced middleware techniques in FMOD Studio and Audiokinetic Wwise, ambiences, mixing, music, and more. This book has something for everyone who is programming audio for a game: programmers new to the art of audio programming, experienced audio programmers, and those souls who just got assigned the audio code. This book is for you!

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This book is your how-to guide for programming audio and sound for the Open Source Linux

Operating System. Readers will learn how to utilize DSPs, sampled audio, MIDI, karaoke, streaming audio and more. Linux is a major operating system that can not only do what every other operating system can do, but can also do a lot more. But because of its size and complexity it can be hard to learn how to do any particular task. The Linux sound system is a major example of this: there is a large variety of tools and approaches for almost every aspect of sound. This ranges from audio codecs, to audio players, to audio support both within and outside of the Linux kernel. What you'll learn: How to do sampled audio What is and how to handle Digital Signal Processing (DSP) How to do MIDI How to build Karaoke like application How to handle streaming audio and more Who is this book for:Experienced Linux users and programmers interested in doing multimedia with Linux and perhaps even game development./div ??????Java???57???????????,????10?,??????:???????????????????????????C????????????
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This concise book builds upon the foundational concepts of MIDI, synthesis, and sampled waveforms. It also covers key factors regarding the data footprint optimization work process, streaming versus captive digital audio new media assets, digital audio programming and publishing platforms, and why data footprint optimization is important for modern day new media content development and distribution. Digital Audio Editing Fundamentals is a new

media mini-book covering concepts central to digital audio editing using the Audacity open source software package which also apply to all of the professional audio editing packages. The book gets more advanced as chapters progress, and covers key concepts for new media producers such as how to maximize audio quality and which digital audio new media formats are best for use with Kindle, Android Studio, Java, JavaFX, iOS, Blackberry, Tizen, Firefox OS, Chrome OS, Opera OS, Ubuntu Touch and HTML5. You will learn: Industry terminology involved in digital audio editing, synthesis, sampling, analysis and processing The work process which comprises a fundamental digital audio editing, analysis, and effects pipeline The foundational audio waveform sampling concepts that are behind modern digital audio publishing How to install, and utilize, the professional, open source Audacity digital audio editing software Concepts behind digital audio sample resolution and sampling frequency and how to select settings How to select the best digital audio data codec and format for your digital audio content application How to go about data footprint optimization, to ascertain which audio formats give the best results Using digital audio assets in computer programming languages and content publishing platforms

This book is divided into two parts. The chapters in Part I offer a comprehensive introduction to the C language and to fundamental programming concepts, followed by an explanation of realtime audio programming, including audio synthesis and processing. The chapters in Part II demonstrate how the object-oriented programming paradigm is useful in the modelling of computer music instruments, each chapter shows a set of instrument components that are paired with key C++ programming concepts. Ultimately the author discusses the development of a fully-fledged object-oriented library. Together with its companion volume, Computer Music

Instruments: Foundations, Design and Development, this book provides a comprehensive treatment of computational instruments for sound and music. It is suitable for advanced undergraduate and postgraduate students in music and signal processing, and for practitioners and researchers. Some understanding of acoustics and electronic music would be helpful to understand some applications, but it's not strictly necessary to have prior knowledge of audio DSP or programming, while C / C++ programmers with no experience of audio may be able to start reading the chapters that deal with sound and music computing.

Chinese edition of Malcolm Gladwell's Outliers: The Story of Success. The #1 New York Times and Amazon bestselling book in nonfiction. Gladwell examines the lives of Outliers - the best of the top 1%, asks what makes them different than ordinary lives. He approaches the remarkable answers that proves this brilliant book is a revolution. Distributed by Tsai Fong Books, Inc.

The essential reference to SuperCollider, a powerful, flexible, open-source, cross-platform audio programming language. SuperCollider is one of the most important domain-specific audio programming languages, with potential applications that include real-time interaction, installations, electroacoustic pieces, generative music, and audiovisuals. The SuperCollider Book is the essential reference to this powerful and flexible language, offering students and professionals a collection of tutorials, essays, and projects. With contributions from top academics, artists, and technologists that cover topics at levels from the

introductory to the specialized, it will be a valuable sourcebook both for beginners and for advanced users. SuperCollider, first developed by James McCartney, is an accessible blend of Smalltalk, C, and further ideas from a number of programming languages. Free, open-source, cross-platform, and with a diverse and supportive developer community, it is often the first programming language sound artists and computer musicians learn. The SuperCollider Book is the long-awaited guide to the design, syntax, and use of the SuperCollider language. The first chapters offer an introduction to the basics, including a friendly tutorial for absolute beginners, providing the reader with skills that can serve as a foundation for further learning. Later chapters cover more advanced topics and particular topics in computer music, including programming, sonification, spatialization, microsound, GUIs, machine listening, alternative tunings, and non-real-time synthesis; practical applications and philosophical insights from the composer's and artist's perspectives; and "under the hood," developer's-eye views of SuperCollider's inner workings. A Web site accompanying the book offers code, links to the application itself and its source code, and a variety of third-party extras, extensions, libraries, and examples.

Accompanying CD-ROM contains complete code for all projects presented in the book. The Max/MSP externals are designed for use with Max 5.

Computers are at the center of almost everything related to audio. Whether for synthesis in music production, recording in the studio, or mixing in live sound, the computer plays an essential part. Audio effects plug-ins and virtual instruments are implemented as software computer code. Music apps are computer programs run on a mobile device. All these tools are created by programming a computer. Hack Audio: An Introduction to Computer Programming and Digital Signal Processing in MATLAB provides an introduction for musicians and audio engineers interested in computer programming. It is intended for a range of readers including those with years of programming experience and those ready to write their first line of code. In the book, computer programming is used to create audio effects using digital signal processing. By the end of the book, readers implement the following effects: signal gain change, digital summing, tremolo, auto-pan, mid/side processing, stereo widening, distortion, echo, filtering, equalization, multi-band processing, vibrato, chorus, flanger, phaser, pitch shifter, auto-wah, convolution and algorithmic reverb, vocoder, transient designer, compressor, expander, and de-esser. Throughout the book, several types of test signals are synthesized, including: sine wave, square wave, sawtooth wave, triangle wave, impulse train, white noise, and pink noise. Common visualizations for signals and audio effects are created including:

waveform, characteristic curve, goniometer, impulse response, step response, frequency spectrum, and spectrogram. In total, over 200 examples are provided with completed code demonstrations.
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Describes the Core Audio framework, covering such topics as recording, playback, format conversion, MIDI conectivity, and audio units.

Discusses the various jobs available in the video game area that are available that don't require a college degree.