The Cambridge Companion to Video Game Music

Video game music has been permeating popular culture for over forty years. Now, reaching billions of listeners, game music encompasses a diverse spectrum of musical materials and practices. This book provides a comprehensive, up-to-date survey of video game music by a diverse group of scholars and industry professionals. The chapters and summaries consolidate existing knowledge and present tools for readers to engage with the music in new ways. Many popular games are analyzed, including Super Mario Galaxy, Bastion, The Last of Us, Kentucky Route Zero and the Katamari, Gran Turismo and Tales series. Topics include chiptunes, compositional processes, localization, history and game music concerts. The book also engages with other disciplines such as psychology, music analysis, business strategy and critical theory, and will prove an equally valuable resource for readers active in the industry, composers or designers, and music students and scholars.

MELANIE FRITSCH is Junior Professor in Media and Cultural Studies with a focus on Game Studies and related fields at Heinrich Heine University Düsseldorf. She is the author of Performing Bytes: Musikperformances der Computerspielkultur (2018).

TIM SUMMERS is Lecturer in Music at Royal Holloway, University of London. He is the author of Understanding Video Game Music (Cambridge, 2016) and The Legend of Zelda: Ocarina of Time – A Game Music Companion (2021).
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The Cambridge Companion to Video Game Music

Edited by

MELANIE FRITSCH
Heinrich Heine University Düsseldorf

TIM SUMMERS
Royal Holloway, University of London
Contents

List of Figures [page xii]
List of Tables [xiv]
List of Musical Examples [xv]
List of Contributors [xvi]
Preface [xxi]
A Landmark Timeline of Video Game Music [xxii]
Foreword: The Collaborative Art of Game Music [xxxiii]

LYDIA ANDREW

Introduction [1]
MELANIE FRITSCH AND TIM SUMMERS

PART I CHIPTUNES

Introduction [5]
MELANIE FRITSCH AND TIM SUMMERS

1 Before Red Book: Early Video Game Music and Technology [12]
JAMES NEWMAN

2 Chiptune, Ownership and the Digital Underground [33]
KENNETH B. MCALPINE

3 Waveform Wizard: An Interview with Composer Junko Ozawa [52]
JUNKO OZAWA, TRANS. LYMAN GAMBERTON

PART II CREATING AND PROGRAMMING GAME MUSIC

Introduction [59]
MELANIE FRITSCH AND TIM SUMMERS

4 Building Relationships: The Process of Creating Game Music [64]
GUY MICHELMORE

5 The Inherent Conflicts of Musical Interactivity in Video Games [74]
RICHARD STEVENS
6 The Triple Lock of Synchronization [94]  
K. J. DONNELLY

7 'Less Music, Now!' New Contextual Approaches to Video Game Scoring [110]  
ROB BRIDGETT

8 Composing for Independent Games: The Music of Kentucky Route Zero [120]  
BEN BARBITT

PART III ANALYTICAL APPROACHES TO VIDEO GAME MUSIC
Introduction [131]  
MELANIE FRITSCH AND TIM SUMMERS

9 Music Games [140]  
MICHAEL L. AUSTIN

10 Autoethnography, Phenomenology and Hermeneutics [159]  
MICHEL KAMPE

11 Interacting with Soundsapes: Music, Sound Effects and Dialogue in Video Games [176]  
ELIZABETH MEDINA-GRAY

12 Analytical Traditions and Game Music: Super Mario Galaxy as a Case Study [193]  
STEVEN REALE

13 Semiotics in Game Music [220]  
IAIN HART

MELANIE FRITSCH

PART IV REALITIES, PERCEPTION AND PSYCHOLOGY
Introduction [263]  
MELANIE FRITSCH AND TIM SUMMERS

15 A Step Back from Reality: Sound and Presence in Computer Games and Other Worlds [269]  
MARK GRIMSHAW-AAGAARD

16 Audio and the Experience of Gaming: A Cognitive-Emotional Approach to Video Game Sound [284]  
DANA PLANK
17 Psychophysiological Approaches to Sound and Music in Games [302]  
DUNCAN WILLIAMS

PART V GAME MUSIC, CONTEXTS AND IDENTITIES  
Introduction [319]  
MELANIE FRITSCH AND TIM SUMMERS

18 Game Music and Identity [327]  
CHRIS TONELLI

19 Game Music and History [343]  
JAMES COOK

20 Open Worlds: Globalization, Localization and Video Game Music [359]  
WILLIAM GIBBONS

21 Female Credit: Excavating Recognition for the Capcom Sound Team [376]  
ANDREW LEMON AND HILLEGONDA C. RIETVELD

PART VI BEYOND THE GAME  
Introduction [389]  
MELANIE FRITSCH AND TIM SUMMERS

22 Pop Music, Economics and Marketing [395]  
ANDRA IVĂNESCU

23 Game Music Beyond the Games [409]  
RYAN THOMPSON

24 Producing Game Music Concerts [424]  
THOMAS BÖCKER, WITH MELANIE FRITSCH AND TIM SUMMERS

Select Bibliography [433]

Index [436]
# Figures

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>The Melon Dezign cracktro from their crack of Thalamus's <em>Creatures</em> (1993) [page 38]</td>
</tr>
<tr>
<td>2.2</td>
<td>Bill Gates's <em>Open Letter to Hobbyists</em> [43]</td>
</tr>
<tr>
<td>5.1</td>
<td>Notification and feedback: Enabling and commenting functions [78]</td>
</tr>
<tr>
<td>5.2</td>
<td>Musical experience of an average approach [86]</td>
</tr>
<tr>
<td>5.3</td>
<td>Musical experience of an aggressive approach [86]</td>
</tr>
<tr>
<td>5.4</td>
<td>Musical experience of a stealthy approach [86]</td>
</tr>
<tr>
<td>5.5</td>
<td>Potential periods of incongruence due to metrical transitions are indicated by the hatched lines [90]</td>
</tr>
<tr>
<td>9.1</td>
<td>Graphical representation of procedural–conceptual axes of music games [157]</td>
</tr>
<tr>
<td>10.1</td>
<td>Bastion's ‘opening shot’ [160]</td>
</tr>
<tr>
<td>12.1</td>
<td>Comet Observatory, early; note darkened, inaccessible area in background [197]</td>
</tr>
<tr>
<td>12.2</td>
<td>Comet Observatory, late; background now illuminated and accessible [198]</td>
</tr>
<tr>
<td>12.3</td>
<td>Matter Splatter Galaxy [201]</td>
</tr>
<tr>
<td>12.4</td>
<td>The two archetypal Schenkerian backgrounds (<em>Ursätze</em>) [203]</td>
</tr>
<tr>
<td>12.5</td>
<td>Mario volleys a coconut at King Kaliente [205]</td>
</tr>
<tr>
<td>12.6</td>
<td>Reductive analysis of the King Kaliente hits [206]</td>
</tr>
<tr>
<td>12.7</td>
<td>Reductive analysis of first half of synth melody [208]</td>
</tr>
<tr>
<td>12.8</td>
<td>A neo-Riemannian network [211]</td>
</tr>
<tr>
<td>12.9</td>
<td>Tonnetz representation of the network in Figure 12.8 (left), and of the third atomic transformation, L (right) [212]</td>
</tr>
<tr>
<td>12.10</td>
<td>Transformational analysis of the first four domes of <em>Super Mario Galaxy</em> [215]</td>
</tr>
<tr>
<td>12.11</td>
<td>Travelling to the Good Egg Galaxy from the Terrace Dome [218]</td>
</tr>
<tr>
<td>13.1</td>
<td>Actions of signs in the semiotic domains of interactive configuration and gameplay [227]</td>
</tr>
<tr>
<td>13.2</td>
<td>Graphical representation in Audacity of waveforms of combat music from <em>Skyrim</em> (mixed down to mono for simplicity; cues listed by filename with <em>Original Game Soundtrack</em> titles indicated) [235]</td>
</tr>
</tbody>
</table>
List of Figures

13.3 Alduin’s appearance at Helgen (silhouette between tower and mountain), and moment of first combat music in *Skyrim* [236]
14.1 The area of cognitive competency following Gebel (2010) [244]
14.2 Extended cognitive competencies model [245]
17.1 Overview of signal flow and iterative evaluation process [315]
Tables

1.1 A comparison of five early video game sound chips [page 20]
12.1 Number of hits and pitches sounded during each volley of the King Kaliente battle [206]
12.2 Primary galaxies with their key centres in Super Mario Galaxy [215]
14.1 Overview of the ludomusicological framework [254]
20.1 Main Katamari series releases, 2004–2018 [364]
20.2 Tales games released in North America (NA) [368]
20.3 Gran Turismo primary titles [373]
Musical Examples

11.1 Castle throne room (excerpt), *Dragon Quest* [page 185]
11.2 The galaxy maps (excerpt), *Super Mario Galaxy* [190]
12.1 Comet Observatory waltz, early (excerpt) [197]
12.2 Comet Observatory waltz, late (excerpt) [198]
12.3 Reduction of Battlerock Galaxy music, first theme (excerpt) [199]
12.4 Reduction of ‘Space Fantasy’ (excerpt), same passage as that associated with Example 12.3 [200]
12.5 King Kaliente battle music (A theme only) (excerpt) [208]
13.1 Excerpt of title music melody from *Morrowind* [230]
13.2 Excerpt of title music melody from *Oblivion* [231]
13.3 Later excerpt of title music melody from *Oblivion* [231]
13.4 Excerpt of title music melody from *Skyrim* [232]
13.5 Later excerpt of title music melody from *Skyrim* (with trumpet accompaniment) [232]
16.1 *The Legend of Zelda*, small treasure sound effect [285]
16.2 *The Legend of Zelda*, secret [287]
16.3 *Super Mario Bros.*, ‘Hurry!’ [289]
16.4 *Metroid*, ‘Item Found’ [296]
16.5 *The Legend of Zelda*, ‘Death’ [296]
16.6 *Super Mario Bros.*, jump and stomp enemy sound effects [297]
16.7 *Mega Man*, Mega Man landing [298]
16.8 *The Legend of Zelda: Breath of the Wild*, Korok seed/small collectible item sound effect [300]
16.9 *The Legend of Zelda: Breath of the Wild*, heart container/stamina vessel sound effect [300]
16.10 *The Legend of Zelda: Breath of the Wild*, spotted by a Guardian cue, bars 1–2 [300]
19.1 ‘Into the Renaissance’ (excerpt), *Civilization V: Gods and Kings*, showing the adaptation of Machaut’s *Messe de Nostre Dame* [355]
19.2 Machaut, *Messe de Nostre Dame* [356]
Contributors

LYDIA ANDREW is currently the Audio Director at Ubisoft Quebec, having previously worked as an Audio Director for Electronic Arts. Most recently, she has served as Audio Director for the Assassin’s Creed games.

MICHAEL L. AUSTIN is Founding Director of the School of Music and Associate Professor of Music at Louisiana Tech University. His research encompasses a wide variety of topics concerning music, technology and the moving image. He is the editor of Music Games: Performance, Politics, and Play (2016).

BEN BABBITT is a composer and one-third of the game developer Cardboard Computer. Beyond his work for albums and film, he composed the music for Kentucky Route Zero (2013–2020).

THOMAS BÖCKER is the founder of Merregnon Studios. He has been conceiving, producing and promoting video game music concerts since 2003. He organized the first game music concert outside Japan and continues to produce orchestral game music albums featuring high-profile orchestras and ensembles.

ROB BRIDGETT is an author and audio director. His books, including Game Audio Culture (2013) and From the Shadows of Film Sound (2010), are informed by his professional work as audio director on titles including Shadow of the Tomb Raider (2018).

JAMES COOK is Lecturer in Music at Edinburgh University. As well as researching Early Music (especially music of the fourteenth to sixteenth centuries), he investigates the representation and use of Early Music in popular culture. He is a co-founder of the REMOSS (Representations of Early Music on Stage and Screen) study group.

K. J. DONNELLY is Professor of Film and Film Music at the University of Southampton. His books include The Spectre of Sound: Music in Film and Television (2005) and Occult Aesthetics: Sound and Image Synchronization (2013). He is the co-editor of Music in Video Games: Studying Play (2013).
**List of Contributors**

**Melanie Fritsch** is Junior Professor in Media and Cultural Studies with a focus on Game Studies and related fields at Heinrich Heine University Düsseldorf. She is a member of the Ludomusicology Research Group, co-founder of the Society for the Study of Sound and Music in Games and the author of *Performing Bytes: Musikperformances der Computerspielkultur* (2018).

**William Gibbons** is Associate Professor of Musicology and Associate Dean of the College of Fine Arts at Texas Christian University. He is the author of *Unlimited Replays: Classical Music and Video Games* (2018) and co-editor of *Music in Video Games* (2013) and *Music in the Role-Playing Game* (2019).

**Mark Grimshaw-Aagaard** is Obel Professor of Music at Aalborg University. He has published extensively on sound both in and beyond video games. He has edited books including *Game Sound Technology and Player Interaction* (2011), and the *Oxford Handbook of Virtuality* (2014) and *Oxford Handbook of Sound and Imagination* (2019).

**Iain Hart** completed his PhD on the semiotics of video game music at the University of Sydney. His research encompasses a variety of topics and approaches, though it is fundamentally concerned with the communicative functions of music. He has also researched music and genre in video games.

**Andra ivoanescu** is a Lecturer in Game Studies and Ludomusicology at Brunel University London. Beyond music her work also engages with key concepts in nostalgia, genre, gender studies and film studies. She is the author of *Popular Music in the Nostalgia Video Game: The Way It Never Sounded* (2019).

**Michiel Kamp** is Assistant Professor of Musicology at Utrecht University. His research takes hermeneutic and semiotic approaches to music in video games and related audiovisual media such as films and virtual reality. His recent publications include research on *Diablo III* and *Skyrim*.

**Andrew Lemon** is a senior lecturer in Music and Sound Design at London South Bank University whose career has spanned multiple platforms including video games, film and art installations. He produces audio for mobile games and is active in the demoscene, as well as building custom music technology including one-off hardware synthesizers.
List of Contributors

KENNETH B. McALPINE is Melbourne Enterprise Fellow in Interactive Composition at Melbourne Conservatorium of Music. His research focuses on how technology changes the creation and consumption of music. He is the author of Bits and Pieces: A History of Chiptunes (2018) and has composed music for film, television and video games.

ELIZABETH MEDINA-GRAY is Assistant Professor of Music Theory at Ithaca College. Her research focuses on developing novel analytical approaches to music and sound in video games. She has illustrated her approaches through analysing games including Flower, Portal 2 and Legend of Zelda games. She also edits the Journal of Sound and Music in Games.

GUY MICHELMORE is a composer for film, television and games. He is also the CEO of ThinkSpace Education, an online postgraduate degree provider in music and sound design, for film, games and television.

JAMES NEWMAN is Professor of Digital Media at Bath Spa University. He has published numerous books on games including Videogames (2004/2013), Playing with Videogames (2008) and Best Before: Videogames, Supersession and Obsolescence (2012). James is Senior Curator at the UK’s National Videogame Museum and a co-founder of the ‘Videogame Heritage Society’ Subject Specialist Network.

JUNKO OZAWA is a video game composer and sound designer. She was a member of the influential Namco Sound Team and created sound for games including Gaplus (1984) and The Tower of Druaga (1984). Her innovative approaches to audio helped shape video game music in its formative years.

DANA PLANK is Lecturer in Music at Ohio State University. Her research interests include disability studies, music and identity, and the sacred music of Carlo Gesualdo. Apart from her PhD research on representations of disability in 8- and 16-bit video game soundscapes, she has also published research on the online culture of Mario Paint Composer and the musical national politics of Tetris.

STEVEN REALE is Professor of Music Theory at the Dana School of Music at Youngstown State University. His research interests include music in video games and music analysis, often in combination. He is the co-editor of Music in the Role-Playing Game (2019) and has published on games including L. A. Noire as well as theoretical topics such as metric dissonance in music.
hillegonda c. rietveld is Professor of Sonic Culture at London South Bank University. Her research focuses on electronic dance music culture, in addition to electronic music and game music. She is the editor of IASPM@Journal, for the Association for the Study of Popular Music and the author of This Is Our House: House Music, Cultural Spaces, and Technologies (1998).

richard stevens is Course Director for the postgraduate programmes in music and sound at Leeds Beckett University. His research interests include the impact of interactive music systems on the video game player experience. He is the co-author of Game Audio Implementation (2015) and The Game Audio Tutorial (2011) amongst other book chapters and articles on game sound and music.

tim summers is Lecturer in Music at Royal Holloway, University of London. He is the author of Understanding Video Game Music (2016) and co-editor of Ludomusicology: Approaches to Video Game Music (2016), as well as other book chapters and articles on video game music.

ryan thompson is Professor of Practice at Michigan State University. His research focuses on intersections between gameplay and audio and he creates remixes of game music as part of OverClocked ReMix. His research has included work on Final Fantasy, League of Legends and music in e-sports events.

chris tonelli is Assistant Professor in History and Theory of Popular Music at the University of Groningen. His research interests include music and culture in Japan, unconventional vocal sound and popular music as mimesis. He is the author of Voices Found: Free Jazz and Singing (2020).

duncan williams is Lecturer in Acoustics and Audio Engineering at the University of Salford. He combines his research interests in psychoacoustics and the human responses to sound with a career as a composer. He is the co-editor of Emotion in Video Game Soundtracking (2018).
Preface

The editors are very grateful to Kate Brett, Commissioning Editor for Music at Cambridge University Press for her enthusiasm and support for the volume, along with her Assistant Editor Eilidh Burrett. Kate and Eilidh both provided encouragement and wisdom throughout the process of creating this volume.

We would like to thank our colleagues of the Ludomusicology Research Group, Mark Sweeney and Michiel Kamp, as well as the members of the Society for the Study of Sound and Music in Games. Their efforts have helped to create the academic community surrounding music in games, whose collaborative spirit has given rise to many of the ideas and findings shared in this book. We would similarly like to thank all of our authors for their generosity in writing contributions for this book.

Unlike most Cambridge Companions, this book deals primarily with music by living composers and artists. During the book’s creation, some of the musicians whose music is discussed by the authors in this volume have been reported as making offensive statements and engaging in personal misconduct. The chosen case studies and examples are in no way an endorsement of the non-musical views of any of the creators mentioned here, nor should they be understood as commenting on the personal behaviour of individuals. We also respect the difficulty of separating art from the artist.

Game music research is a young field, and we hope that the knowledge gathered here from practitioners and researchers representing a diverse set of backgrounds will inspire readers’ own explorations. As the field continues to grow, we hope to continue to welcome even more views and perspectives on this exciting music that reaches so many ears.
A Landmark Timeline of Video Game Music

This timeline presents a number of landmarks in the history of video game music. To avoid presenting a history that is inappropriately linear or giving a false impression of completeness, we have selected landmark moments that reveal the changing forms and technologies of game music, as well as game music’s relationship with wider culture.

<table>
<thead>
<tr>
<th>Year</th>
<th>Landmark</th>
<th>Contemporary technology and world events</th>
</tr>
</thead>
<tbody>
<tr>
<td>1972</td>
<td>Pong (Atari)</td>
<td>Pitched sound is introduced into video games, with different notes linked to gameplay events. The last mission of the Apollo space programme lands on the moon.</td>
</tr>
<tr>
<td>1975</td>
<td>Western Gun/Gun Fight (Taito/Midway/Nutting)</td>
<td>Games begin to use distinctive melodies in the mid-1970s. This early example includes an excerpt of Chopin’s ‘Funeral March’, when a character is killed. The Altair 8800 is released in January, sparking the microcomputer revolution as the first commercially successful home computer.</td>
</tr>
<tr>
<td>1978</td>
<td>Space Invaders (Taito)</td>
<td>In likely the first example of continuous music reacting to the gameplay, the four-note ostinato in <em>Space Invaders</em> increases in tempo as the aliens advance. The Camp David Accords are signed between Israel and Egypt.</td>
</tr>
<tr>
<td>1978</td>
<td>Yellow Magic Orchestra release an album of the same name</td>
<td>Yellow Magic Orchestra’s first LP includes chip music, illustrating an early convergence between pop music and games. The single release ‘Computer Game’ subsequently influences early hip-hop and techno musicians in the USA.</td>
</tr>
<tr>
<td>1979</td>
<td>‘Space Invaders’ song by Player (1) released</td>
<td>Using audio from <em>Space Invaders</em> and a bassline influenced by the game, this song becomes Islamic revolution in Iran.</td>
</tr>
<tr>
<td>Year</td>
<td>Landmark</td>
<td>Contemporary technology and world events</td>
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<td>------</td>
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<tr>
<td>1981</td>
<td><em>Frogger</em> (Konami/Sega)</td>
<td>First launch of NASA’s space shuttle.</td>
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<tr>
<td></td>
<td>’Pac-Man Fever’ single by Buckner &amp; Garcia</td>
<td>This novelty hit about <em>Pac-Man</em> finds chart success and is followed by a game-themed concept album of the same name in 1982.</td>
</tr>
<tr>
<td>1982</td>
<td>Adoption of the MIDI 1.0 standard</td>
<td>The Falklands Conflict erupts between the UK and Argentina.</td>
</tr>
<tr>
<td>1982</td>
<td>MOS 6581 SID chip is used as the sound chip for the Commodore 64</td>
<td>Designed by Robert Yannes, the SID chip offers composers great flexibility. Though it only features three main voices, composers can select waveforms for the channels and each has a wide pitch range. Beyond the Commodore, the SID chip in its several iterations and variations inspires musicians and becomes an important feature of the chip-tune scene.</td>
</tr>
<tr>
<td>1983</td>
<td><em>Journey</em> (Bally/Midway)</td>
<td>The first commercial mobile telephone call is made.</td>
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<td>1983</td>
<td><em>Moondust</em> (Creative/Lanier)</td>
<td>One of the first so-called ‘art games’, created by Jaron Lanier for the Commodore 64,</td>
</tr>
<tr>
<td>Year</td>
<td>Landmark</td>
<td>Contemporary technology and world events</td>
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<tr>
<td>1984</td>
<td><em>Ballblazer</em> (LucasArts)</td>
<td>In contrast to <em>Moondust</em>, <em>Ballblazer</em> features an algorithmically created theme song, ‘Song of the Grid’ by Peter Langston, in a rock style. Bob Geldof and Midge Ure assemble a supergroup of musicians to perform a charity single under the name Band Aid.</td>
</tr>
<tr>
<td>1984</td>
<td><em>Video Game Music</em> (LP)</td>
<td>Haruomi Hosono assembles the first commercial album of video game music, featuring captures and remixes of sound from Namco games.</td>
</tr>
<tr>
<td>1986</td>
<td><em>Dragon Quest</em> Symphonic Suite album</td>
<td>An album of <em>Dragon Quest</em>’s music is released, with the music arranged for orchestral performers. It marks the beginning of orchestral game music albums. The Chernobyl nuclear power plant undergoes a catastrophic disaster.</td>
</tr>
<tr>
<td>1986</td>
<td>Special game music issue of the Japanese gaming magazine <em>Beep</em></td>
<td>The Japanese gaming magazine <em>Beep</em> was first published in 1984. This special issue augments their audience significantly. After this issue the magazine features a regular section dedicated to game music.</td>
</tr>
<tr>
<td>1986</td>
<td><em>Soundmonitor</em></td>
<td>Chris Hülsbeck releases his <em>Soundmonitor</em>, the first tracker program for users to create their own music, as a listing in the German computer magazine <em>64er</em>.</td>
</tr>
<tr>
<td>1986</td>
<td><em>OutRun</em> (Sega)</td>
<td>This arcade racing game by Sega is notable for several aspects, including its outstanding hardware and non-linear gameplay. It also allows players to choose the music to accompany their play. The music, composed by Hiroshi Kawaguchi, later inspires the synthwave genre called OutRun in the early 2000s,</td>
</tr>
<tr>
<td>Year</td>
<td>Landmark</td>
<td>Contemporary technology and world events</td>
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<td>------</td>
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<tr>
<td>1987</td>
<td>Dragon Quest Concert in Tokyo</td>
<td>Koichi Sugiyama stages a 'Family Classic Concert' at Suntory Hall, Tokyo. The concert programmes his music from Dragon Quest I and II alongside Saint-Saëns's Carnival of the Animals. It is likely the first orchestral concert of video game music. A West German teenager lands a light aircraft in Moscow's Red Square.</td>
</tr>
<tr>
<td>1987</td>
<td>Dance Aerobics (Bandai/Human, Nintendo)</td>
<td>This release for the Famicom/NES is the first game to feature a floor mat controller, the Power Pad. It anticipates later dance games.</td>
</tr>
<tr>
<td>1987</td>
<td>Otocky (Sedic/ASCII)</td>
<td>Otocky is a musical sidescroller shoot-'em-up game by Toshio Iwai for Nintendo's Famicom. It is notable for its generative soundtrack, co-created by the player while playing. It was never released outside Japan.</td>
</tr>
<tr>
<td>1987</td>
<td>Commodore Amiga makes extensive use of the MOD music format</td>
<td>The Amiga uses a format for storing music which is similar to MIDI, but also includes the instrument samples in the files, as well as the note data, which creates significant possibilities for unique musical timbres.</td>
</tr>
<tr>
<td>1988</td>
<td>Soundtracker 2</td>
<td>'Exterminator' of the Dutch hacker group Jungle Command hacks Karsten Obarski's Soundtracker, and rereleases it as freeware under his own name, making the playback routine public. It starts the soundtracker revolution, and other trackers are later built from it (like NoiseTracker and ProTracker). The Morris Internet Worm, the first internet-spread malware, wrecks havoc.</td>
</tr>
<tr>
<td>1991</td>
<td>Monkey Island 2: LeChuck's Revenge (LucasArts)</td>
<td>LucasArts debut iMUSE, an interactive music system, demonstrating complex technology. The Cold War ends with the dissolution of the USSR.</td>
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xxvi A Landmark Timeline of Video Game Music

(cont.)

<table>
<thead>
<tr>
<th>Year</th>
<th>Landmark</th>
<th>Contemporary technology and world events</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991</td>
<td>General MIDI standard established</td>
<td>To combat the high degree of variation between sound cards and hardware, General MIDI presents a template of 128 instruments, so composers are able to address specific instruments in their sound files. This ensures that, for example, a part written for a violin always sounds as a violin.</td>
</tr>
<tr>
<td>1992</td>
<td>Streets of Rage II (Sega)</td>
<td>Streets of Rage II is the second entry in Sega’s side-scrolling beat-’em-up series and features a soundtrack inspired by 1990s club music, created by Yuzo Koshiro and Motohiro Kawashima. Atari, Nintendo and Sega are all involved in lawsuits concerning reverse engineering and modification of games.</td>
</tr>
<tr>
<td>1994</td>
<td>Michael Jackson is engaged to write music for Sonic the Hedgehog 3</td>
<td>Video games begin to attract major pop stars to write music specifically for games. One of the world’s most famous musicians is involved in Sonic 3. Ultimately he is uncredited in the released game. His contribution to the finished game would long be the subject of avid speculation. British band Right Said Fred promote Sonic 3 with their song ‘Wonderman’. Jackson appears in several games, including Moonwalker (1989) and Space Channel 5 (1999). Nelson Mandela becomes the first president of South Africa.</td>
</tr>
<tr>
<td>1995</td>
<td>Wipeout (Psygnosis)</td>
<td>Wipeout is released as a PlayStation launch title in Europe and features music from electronic music acts such as Orbital, The Chemical Brothers, Underworld and Leftfield. It is part of a wider eBay and Windows 95 are launched.</td>
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<tr>
<td>Year</td>
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<tr>
<td>1996</td>
<td>PaRappa the Rapper (NanaOn-Sha)</td>
<td>Dolly the sheep is born, the first mammal cloned from a somatic cell.</td>
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<td></td>
<td>This rhythm-based music game is created by music producer Masaya Matsuura and Rodney Greenblat. A comic-styled dog PaRappa learns to rap from several teachers. It is a commercial success on the PlayStation in Japan and is one of the starting points of the Japanese music game boom of the late 1990s.</td>
<td></td>
</tr>
<tr>
<td>1997</td>
<td>The Lost World: Jurassic Park (Dreamworks) (PlayStation and Saturn)</td>
<td>Deep Blue beats Garry Kasparov in a chess match, the first computer to beat a current world champion.</td>
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<td></td>
<td>This game, with music by Michael Giacchino, is one of the first to use a recorded orchestra for the soundtrack, made feasible by the space and facilities of CD-based consoles.</td>
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<tr>
<td>1997</td>
<td>Beatmania (Konami)</td>
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<td></td>
<td>The DJ-style rhythm game Beatmania, along with PaRappa, launches the Japanese game music boom. Beatmania lends its name to Konami’s eponymous Bemani line of music games.</td>
<td></td>
</tr>
<tr>
<td>1998</td>
<td>Dance Dance Revolution (Konami)</td>
<td>Tencent and Google are founded.</td>
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### A Landmark Timeline of Video Game Music

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<tr>
<td>2000</td>
<td>LSDJ (Little Sound DJ)</td>
<td>Johan Kotlinski creates tracker software to turn a Game Boy into a synthesizer, allowing direct control of the Game Boy’s five hardware sound channels with a straightforward interface. It becomes a staple of the chiptune scene. Apocalyptic predictions of the consequences of the Millennium Bug computer date error fail to materialize.</td>
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<tr>
<td>2001</td>
<td>Grand Theft Auto III (Rockstar)</td>
<td>With DVD storage as a dominant format, games could now include significantly more recorded and licensed music. <em>Grand Theft Auto III</em> features pre-existing music as part of in-game radio stations, complete with announcers and fictional adverts. The United States suffers a terrorist attack on 11 September, prompting a controversial ‘War on Terror’.</td>
</tr>
<tr>
<td>2001</td>
<td>Release of the album <em>Music inspired by Final Fantasy: The Hollywood Symphony Orchestra and Chorus Perform The Music of Nobuo Uematsu</em></td>
<td>In the 1980s and 1990s, most game music albums are only available outside Japan as expensive imports or as bootleg MP3s. In 1997, Stephen Kennedy starts the ‘Project Majestic Mix’, a group of game music fans who want to produce an album. Via the project’s website, the group select the music and fund the project with donations from other fans. Kennedy contacts Uematsu and Square to clarify issues of copyright and licensing. He is successful and the first album is released. It is followed by three more albums of music from Square games.</td>
</tr>
<tr>
<td>2001</td>
<td>Rez (United Game Artists)</td>
<td>The game <em>Rez</em> is released (in Japan in a bundle with a peripheral called the Trance Vibrator) aiming at recreating the experience of a rave.</td>
</tr>
</tbody>
</table>
| 2001 | Virtual music by In Extremo in Gothic (Piranha Bytes) | The German medieval rock band In Extremo appears in the fantasy game *Gothic*, performing their live rendition of ‘Herr
### A Landmark Timeline of Video Game Music

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<tr>
<td>2003</td>
<td><strong>Symphonic Game Music Concert in Leipzig</strong></td>
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<td></td>
<td>Opening the Leipzig Games Convention, Thomas Böcker produces the first commercial game music concert outside Japan, starting an ongoing tradition of Western concerts of game music.</td>
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<tr>
<td>2005</td>
<td><strong>Guitar Hero (RedOctane)</strong></td>
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<td></td>
<td>Starting a craze for rhythm music games in the West, <em>Guitar Hero</em> captures the interest of a wide audience attracted by the performative possibilities of the game.</td>
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<td>2008</td>
<td><strong>Spore (Maxis)</strong></td>
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<td></td>
<td>Procedural generation is central to the ‘God game’ <em>Spore</em>. It features an elaborate music system that procedurally generates music on the fly, rather than playing pre-composed music. Similar examples include <em>No Man’s Sky</em> (2016).</td>
</tr>
<tr>
<td>2008</td>
<td><strong>Karen Collins publishes <em>Game Sound</em></strong></td>
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<td></td>
<td>The first academic volume dedicated to video game music and sound gives the area of study new legitimacy.</td>
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<tr>
<td>2008</td>
<td>‘Auto-Mario Wipeout’ or ‘X Day’ on Nico Nico Douga</td>
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<td></td>
<td>On May 13th, 2008, Japanese video platform Nico Nico Douga bulk-deletes fan-made Automatic Mario videos because of copyright infringement. Automatic Mario is a specific subgenre of remix videos using customized Super Mario World levels to recreate popular songs and other music.</td>
</tr>
<tr>
<td>2008</td>
<td>‘Symphonic Shades’ concert is broadcast live</td>
</tr>
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</table>
|      | The WDR Rundfunkorchester, conducted by Arnie Roth, perform a concert dedicated to the game music of Chris Hülsbeck: “Symphonic
## Landmark Timeline of Video Game Music (cont.)

<table>
<thead>
<tr>
<th>Year</th>
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</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>DJ Hero</td>
</tr>
<tr>
<td></td>
<td>(FreestyleGames)</td>
</tr>
<tr>
<td></td>
<td>Shades” – Hülsbeck in Concert’. This is the first game music concert to be broadcast live on radio and streamed on the internet.</td>
</tr>
<tr>
<td>2009</td>
<td>The cryptocurrency Bitcoin is launched.</td>
</tr>
<tr>
<td>2011</td>
<td>Christopher Tin’s ‘Baba Yetu’ wins a Grammy Award</td>
</tr>
<tr>
<td></td>
<td>Written for <em>Civilization IV</em> (2005), and later rereleased on Tin’s 2009 studio album, ‘Baba Yetu’ becomes the first music composed for a video game to win a Grammy Award. It was nominated in the category ‘Best Instrumental Arrangement Accompanying Vocalist(s)’.</td>
</tr>
<tr>
<td>2011</td>
<td>Anti-government protests spread across the Arab world, a phenomenon named the ‘Arab Spring’.</td>
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<tr>
<td>2011</td>
<td>Rocksmith (Ubisoft)</td>
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<tr>
<td></td>
<td>Rocksmith is released, featuring the option to plug in a real guitar and advertising that players can learn to play the guitar through the game.</td>
</tr>
<tr>
<td>2011</td>
<td>Emily Reese begins a long-running programme celebrating game music and interviewing composers on Classical Minnesota Public Radio.</td>
</tr>
<tr>
<td>2012</td>
<td>Journey’s soundtrack nominated for a Grammy award</td>
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<td></td>
<td>Austin Wintory’s music for <em>Journey</em> is nominated for ‘Best Score Soundtrack for Visual Media’, the first time a game score is nominated in this category.</td>
</tr>
<tr>
<td>2015</td>
<td>The Higgs boson elementary particle is discovered.</td>
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<tr>
<td>2015</td>
<td>Undertale (Toby Fox)</td>
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<tr>
<td></td>
<td>The rise of digital distribution and open or free development tools prompts a blossoming of independent game development. In seeking a different approach to high-budget releases from major studios,</td>
</tr>
<tr>
<td>2015</td>
<td>The Paris Agreement on climate change is negotiated at a United Nations climate conference.</td>
</tr>
</tbody>
</table>
### Year | Landmark | Contemporary technology and world events
--- | --- | ---
2018 | AR K-pop live concert opens the *League of Legends* World Championships | As e-sports tournaments come to more closely emulate traditional sporting events, Riot Games opens its annual *League of Legends* World Championships with a spectacular show including an augmented reality performance by K-pop group K/DA. According to the UN, more than half of the world’s population is now using the internet.

2020 | *Journal of Sound and Music in Games* published | An academic journal dedicated to the study of music and games is launched by the Society for the Study of Sound and Music in Games. The world experiences a global pandemic of the Covid-19 virus.

2020 | Travis Scott stages a concert in *Fortnite* | 12.3 million players attend a virtual concert in a game. Though online games have been hosting performances since the mid-2000s, this event brought new attention to the format.
Foreword: The Collaborative Art of Game Music

LYDIA ANDREW

I greatly welcome the opportunity to write this foreword to The Cambridge Companion to Video Game Music. The essays in this collection share ideas about this dynamic, shape-shifting, all-embracing discipline from multiple perspectives. That sharing is a communal, creative effort. In many ways, it is what video games themselves are all about.

Music is a key moment where the creative vision of player experience crystallizes. Whatever the genre of game, music can characterize avatars, it can enhance settings, it can deepen emotions and shape the pace of games.

Game music is an experience. It is not linear. Every change comes from a hook in gameplay, a decision of programming, a variation in the system based on the player’s input. To create a consistent player experience, both diegetic and non-diegetic music, and the role of music within the larger soundscape, demand a through line deeply grounded in our response and engagement with the game. Research, creative expression and the ongoing search for ways to connect with our players: all are synergistic and raise issues of identity and psychology. One of the great, continuing pleasures of developing and playing video games is that this work is never done. This is what has most inspired me in my work on the Assassin’s Creed brand, specifically Syndicate (2015) and Odyssey (2018).

Game music is a truly collaborative creative endeavour, which draws deeply on a range of people’s skills. The music team works with world designers, animators, game designers, gameplay programmers and audio programmers, without speaking of the composers, musicians, arrangers, lyricists, researchers and the rest of the audio team (dialogue and sound effects) with whom they must liaise. The larger the scale of the game, the greater the challenges to consistency in the game architecture into which we all feed. But on smaller games too, the ultimate design of music is determined by the particular player experience a team collectively foresees. It is an emotional and creative vision that must first be defined.

For my part, that collaborative process begins with our early concept art, narrative outlines and gameplay ideas. These provide touchstones to discuss with the rest of the development team – the evocations, moods...
and themes that are the building-blocks of our living and breathing world. These in turn suggest paths of ever-deepening research.

For both *Syndicate* and *Odyssey*, we wanted a holistic design of music. We wanted diegetic and non-diegetic music to be symbiotic. Music speaks constantly of shared community – it is born of art and architecture, of commerce, beliefs, logistics, wider cultural life, even the weather of its locale. For *Syndicate*, that locale was mid-Victorian London, engine of innovation and modernity, and of the great social and psychological disruptions that go with them. A Londoner myself, I needed to hear experimentation, immediacy, aggression and something of that psychic dislocation in the style. Austin Wintory tuned into this. Aided by critical musicologist Prof. Derek Scott and traditional music producer Dave Gossage, we curated a selection of songs which captured the atmosphere of each district of London. For instance, light opera, military music and hymns for Westminster; pub singalongs and folk music for Whitechapel. From each selection, we further chose one song as the key motif for that district. Westminster became *'Abide with Me'* and Whitechapel became *'My Name It Is Sam Hall'*.

Against this use of popular music for atmosphere, we used commissioned ballads to deepen the drama of the game story itself. The game’s progression demands critical assassinations, so the band Tripod in Australia and Austin wrote original murder ballads, attuned to the personality of each victim, modelling them on popular Victorian storytelling songs. The intimate dance of death further informed the score – we hear small chamber ensembles, solo string instruments attached to characters, the light ‘springiness’ of waltzes and mazurkas, the immediacy of scherzo sketches.

For *Odyssey*, the world was larger and more complex.

The commissioned score took over two years to develop. The musical duo The Flight are multi-instrumentalists and producers as well as composers. We had to discover Ancient Greece together. Consequently, the research effort demanded was great. Little music survives from the Golden Age of Ancient Greece. We looked at ancient vases and sculptures for visual clues, and to ancient texts for lyrics and poetry. We wanted an intimate, handmade, acoustic feel. We found one sonic signature in the Aulos, a key instrument in ceremonies and festivals, reconstructed from archaeological findings. In exploring how this instrument was played, we came to appreciate its relevance to a modern audience. To do this, we...
combined voices and other instruments in such a way as to appeal to modern musical aesthetics and used this instrument at significant moments in our non-diegetic underscore.

The diegetic music also took two years to develop and followed multiple parallel tracks. For historical materials, I drew on the work of individual experts – musical anthropologists, archaeologists, highly skilled craftspeople who reconstruct ancient instruments, local Greek practitioners. On the one hand, we created facsimiles of ancient Greek songs based on texts of the period, such as the sea shanties for which melodies were devised by Dimitris Ilias of Chroma Musica and Giannis Georgantelis. On the other, we themed our choice of story songs, which reflect the specific narrative and character arc of the game, around the notion of odyssey. The lyrics for these were written by Emma Rohan, with music composed by Giannis Georgantelis. All this also fed back into the commissioned non-diegetic material.

Finally, there is the life of our game music outside the game. This is a new collaboration in itself. The music experience we deliver lives on through players’ imaginations, in the many cover versions and reinventions players spawn. They reinterpret and share their work in the even wider context of social media. Many reworkings exist of the murder ballads and underscore from Syndicate. The first cover of the main theme track from Odyssey was uploaded before the game itself was released. This is a greater celebration of game music, seen also in the recent Assassin’s Creed Symphony series and many other live music events. This community that has developed around game music is huge, ever-evolving and constantly energizing. It is perhaps appropriate that my brief remarks end with them.

Lydia Andrew
Quebec, March 2020