Introduction

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It is hard to think of another field of cultural practice that has been as comprehensively turned upside down by the digital revolution as music. Digital instruments, recording technologies and signal processing techniques have transformed the making of music, while digital dissemination of music – through the Internet and earbuds – has transformed the way people consume it. Live music thrives and mostly relies on digital technology, but alongside it music has become integrated into the patterns of social networking and urban mobility that increasingly structure people's lives. The digital revolution has destabilised the traditional music business, with successive technologies reconstructing it in different forms, and at present even its short-term future is unclear. (Just as this book is going to press, Apple has announced the discontinuation of iTunes, the most commercially successful response to Napster.) Meanwhile digitalisation has changed what sort of thing music is, creating a multiplicity of genres, some of which exist only online – indeed, downloads and streaming have problematised the extent to which music can reasonably be thought of as a 'thing' at all. Technology that is rapidly pervading the globe is re-engineering relationships between geographically removed traditions (including by removing geography from the equation). Some see this near meltdown of so many aspects of traditional musical culture as a harbinger of fundamental social change to come.

In short, music in digital culture is a bewildering world, most of all for those in the middle of it. This *Companion* attempts to make sense of a constantly changing field through a series of complementary perspectives: eleven chapters address topics that range from the economics of music in the digital age to relationships between technology and culture, music recommendation technologies, constructions of selfhood, the politics of protest, religion on the web, liveness, virtuality, the posthuman, and global perspectives. It also includes what we call 'personal takes' (PTs), short essays – often by digital practitioners – that focus on specific issues, genres, professional practices, and experiences, so aiming to communicate something of the specificity of life and work in the digital cultures of music. PTs are interspersed throughout the volume, not according to a regular plan but so as to throw light on the preceding or following chapters or strike sparks with adjacent PTs. Each chapter and each personal take is a

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self-sufficient entity when read the digital way, as a series of separate tracks, but the book is designed to offer added value when its various constituents are read together. The following is a description of the pathway embodied in the printed version of the book.

Chapter 1, Nicholas Cook's 'Digital Technology and Cultural Practice', offers a broad overview of music in digital culture, focusing in particular on the social dimensions that the technology has opened up: the aim is to set out the field that subsequent chapters populate in detail. This is followed by a PT in which Lee Marshall discusses an immediately pre-digital musical community and how it was impacted by the advent of digital technology. The main part of the book is bookended by two chapters from Martin Scherzinger that focus on the intersection of technology and economics: Chapter 2 ('Toward a History of Digital Music: New Technologies, Business Practices and Intellectual Property Regimes') provides a historical account of how the world of digital music as we know it came about, while a PT by Ingrid Monson illustrates the role played by copyright through an insider's account of the high-profile lawsuit over 'Blurred Lines'. In 'Shaping the Stream: Techniques and Troubles of Algorithmic Recommendation' (Chapter 3), K. E. Goldschmitt and Nick Seaver offer a critical overview of playlisting technologies: these represent a key interface between the streaming technologies that dominate today's music business and the practices of digital consumption and aesthetics. Two PTs offer close-up views of this world, one (by Ben Sinclair) conveying the flavour of life as a curator within a music recommendation start-up, the other (by Stéphan-Eloïse Gras) asking searching questions about the nature of taste.

Chapter 4 ('Technologies of the Musical Selfie'), by Sumanth Gopinath and Jason Stanyek, is structured around what might seem a marginal phenomenon within digital culture, in which automated facial recognition generates a personalised musical artefact, what the authors call the musical selfie – but it turns out to be a high road into a world of music as medium of self-definition and interpersonal relationships that is anticipated by but goes far beyond anything in pre-digital culture. This is followed by a PT from Adam Harper that explores the equally esoteric world of vaporwave, a digital audio-visual genre that might be described as not just *on* the web but *about* it. Peter McMurray's 'Witnessing Race in the New Digital Cinema' (Chapter 5) documents an emerging film practice whereby smartphone videos bear witness to social injustice, focusing in particular on the politics and ethics of racial violence: here digital media play a role in society that builds on pre-digital cinematic resistance but puts it in everyone's hands. A PT by Mariana Lopez explores the same issue of giving voice to the voiceless in the quite different domain of digital heritage.

Religious devotion and spirituality, the topic of Monique M. Ingalls's 'Digital Devotion: Musical Multimedia in Online Ritual and Religious Practice' (Chapter 6), represent another area transformed by digital culture, and Ingalls documents the role of music in contexts ranging from digital resources for offline devotion to online performances of personal spirituality that elide the virtual and the divine: the Internet simultaneously complements, reinforces and undermines established religions. A PT by Graham St John on EDM as a performance of the sublime is followed by two on algorave, a recent performance genre based on real-time programming, authored respectively by members of the live coding duo The Humming Wires and by Alex McLean. Like 'live' coding, 'live' performance is defined by its other – live music is what recorded music is not – and in Chapter 7 ('Rethinking Liveness in the Digital Age') Paul Sanden takes up the topic of how technology can re-create, even in a virtual environment, the sense of human presence that defines live performance. The emphasis on performance continues with the first of a group of PTs that sample the roles of digital technology across key creative practices of music: Andrew McPherson addresses performance from the perspective of instrument design, and Steve Savage reflects on the pros and cons of digital versus analogue recording, while Julio d'Escriván and Stephen Baysted focus on composition. D'Escriván reflects on how the practices of digital multimedia have led him to think about musical sound in a new way, while Baysted compares the very different natures of composition for concert listening and for the specifically digital genre of video games.

A further two chapters explore the dimension of the virtual opened up by Sanden. Isabella van Elferen's 'Virtual Worlds from Recording to Video Games' (Chapter 8) claims that music is not just an important dimension of virtual worlds, but can lead to an enhanced understanding of what virtuality is: she argues that the virtual existed in the pre-digital age (both literary narrative and recorded music create their own virtual worlds), but that virtual reality technologies are extending it in fundamentally new ways. In creating experiences located outside what we have thought of as the real world of embodied individuals and material objects, the virtual worlds of digital multimedia open up issues of how far machines and algorithms can extend human capacities, or lead to a more fundamental rethinking of the 'human'. David Trippett's 'Digital Voices: Posthumanism and the Generation of Empathy' (Chapter 9) assesses the impact of digital technology on human agency, the significance of machines that speak to us in beguiling female voices, and an opera that explores the ethical dimensions of immortality achieved through the downloading of human minds to computers. A PT by Frances Dyson traces the arc of posthuman thought from the celebratory futurism of the age before the dot-com bubble burst

to the ethical and environmental potential of a human culture purged of anthropocentrism.

The book concludes with two chapters that critique contemporary thinking about music in digital culture from different directions. Shzr Ee Tan's 'Digital Inequalities and Global Sounds' (Chapter 10) emphasises the first-world, even anglophone bias of the supposedly global culture of the World Wide Web, counterposing it with perspectives drawn from elsewhere, particularly China: here, as often in digital culture, utopian and dystopian visions of technology are set in opposition, coexist, or on occasion become indistinguishable from one another. Finally, in Chapter 11 ('The Political Economy of Streaming') Martin Scherzinger complements his earlier chapter by scrutinising the current state of the digital music industry and the larger economy within which it is situated: in doing so he picks up on the concerns expressed by Tan and other contributors about the way in which, through streaming, music has become entangled in a growing culture of digital data collection and surveillance. Nothing could more clearly illustrate how music, too often thought of as just a form of entertainment, has become a key dimension of social, economic and even political life in the digital age.