[Review] Tom Garner (2018) Echoes of other worlds: sound in virtual reality

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Echoes of Other Worlds: Sound in Virtual Reality by Tom Garner. London, Palgrave MacMillan, 2018, 377 pp. £63.99 (ebook)/£79.99 (hardcover). ISBN 978-3-319-65707-3.

Review: Thor Magnusson

There is an open season for VR sound. *Echoes of Other Worlds* ends with a section with this title, and its author, Tom Garner, is right in pointing to the innumerable interdisciplinary possibilities represented by sound in virtual reality. The book is part of the Palgrave Studies in Sound, an excellent series with a unique take on the vibrant research field of sound studies. Edited by Mark Grimshaw-Aagaard, the series attempts to understand the relational nature of sound: how it connects with other cultural domains from the perspective of social and aesthetic theory. The author is a Research Fellow at the University of Portsmouth, specialising in sound design for virtual reality. The book provides a solid outline of the nature of sound in virtual reality from a broad techno-philosophical perspective that should benefit anyone creating or analysing virtual reality content.

Virtual reality is not new, as quickly pointed out by the author. The modern concept can be traced back to 1960s in the form of technological media but much further when considering film and literature. However, it was with the hype of immersive multimedia in the 1990s that the technology began to be researched and developed in the world's media labs, followed by commercial products entering the market. Universities began to provide degrees in the design for virtual reality, but after years of motion sickness in poor-quality multimedia headsets, lagging visuals, and schizophonic sound sources the enthusiasm had somehow dwindled by the mid 2000s. However, VR is now back with vengeance and all the key media manufacturers and service providers are busy developing plans for future social media and games on this platform.

Echoes of Other Worlds tells a background story of VR and presents its potential in future media. The book is divided into nine chapters. After an introduction to the topics of the book, the book explores the notion of virtuality itself. What kind of concept is this? Where does it derive from and how has it manifested in the past? Garner's scope is broad and he illustrates how we apply this term in our new technologies, arguing that the telephone, television and social media are also technologies that present us with virtual experiences and worlds. The book presents an extensive philosophical outlining of the emergent nature of sound: it is a holistic phenomenon, which cannot be explained exclusively in terms of its origins, its media or its perceiver.

The book argues for importance of user experience in the design of virtual reality worlds and discusses the role of sound to make a realistic environment. The key concept of immersion is presented and analysed (although it is somewhat surprising that Bolter and Grusin's *Remediation* book is not referenced here) and contextualised with other psychological factors such as flow and fun, or rather, denominators of states where we forget about the medium, suspend our disbelief and immerse ourselves in a virtual world of interactive engagement. Parallel to his analysis of sound, Garner argues for an emergent model of understanding VR: just as sound cannot be said to be only one of its necessary constituents, the experience of immersion is one that cannot be reduced to either the system or the user.

Reading the book linearly, one begins to miss a deeper engagement with sound in VR. Perhaps it is symptomatic of the problems of sound in virtual reality that a book on the topic seems overly ocularcentric? The sections on representations in VR are excessively visual, discussing VR in literature and film but not from the perspective of sound. There are sections on

sound but they often seem to take the back seat. For example, in chapter 7, called “Reality Check,” we find a discussion of the state of the art in VR. Even this far into the book one feels that sound is somewhat placed at the periphery of the discussion, since haptics, motion tracking and speech recognition are privileged. Sound is always present, as the section on positional audio indicates, but it would be stretching it to state that sound is central to the analysis. It is therefore very welcome that chapter eight deals almost exclusively with sound in VR. By that time the reader will possibly be wondering why this core information about HRTF (Head-related transfer function), spatialisation, volumetric sound, environmental modelling, ambisonics and procedural audio appears so late in the book. These are core concepts that could arguably have been used as analytic instruments in the analysis in previous sections.

The final chapters of the book discuss the applications and future of VR - and that is a bright future indeed, with applications including data visualisation (and sonification - a section that appears after the ocularcentric data *visualisation* section), telepresence, education and skills training, VR in art and culture, health and well-being. This discussion clearly demonstrates the richness of applications possible for virtual reality but the reader is positioned to think that there must be many more: might there also be applications in musical performance, instrument making and development, audio games, socialising and clubbing, concerts, and tourism (including real and historical places, musical worlds, as well as underwater or space travel). In the book there is no mention of projects such as WaveVR, Melody VR or Oldfield’s MusicVR, which would provide an excellent concrete starting point for current developments.

Notwithstanding the above criticism, *Echoes of Other Worlds* is a fascinating book. It does not teach the art of designing sound in VR environments but rather engages with a deeper and fundamental questioning of what sound is and how it might be used in immersive media environments. It will not serve as a course book in VR sound design, nor a handbook for VR audio, but nevertheless it is an essential and grounded work in the philosophical and perceptual underpinning of what sound in virtual reality means and how it might evolve. The book can therefore be recommended to anyone working in virtual reality, because, as the book argues, the realism or qualitative experience of a virtual world can never reach higher fidelity than that represented by its sound design. Even if sound is not visible in these systems and won’t be depicted in computer game or media magazines or experienced as locative sound on web pages, it is what separates a quality VR world from a mediocre environment. So, take notice VR producers and ludologists! This book belongs in your library.

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