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Martin Clancy, ed.

ARTIFICIAL
INTELLIGENCE AND
MUSIC ECOSYSTEM

Routledge, 2023.

Martin Clancy's book, *Artificial Intelligence and Music Ecosystem*, an edited collection of fifteen chapters, provides an all-round view of AI and music. Alongside Clancy, invited contributors to the book include composer David Cope, Miller Puckette (inventor of MAX and Pure Data²), and AI music company founder Mick Kiely. Other chapters include interviews with ecosystem participants including Jacques Attali, Holly Herndon and Steve Cohen. Frustratingly, either deliberately or as an oversight, Clancy does not define the term music ecosystem until nearer the end of the book, when he states that it "encompasses ANT [Actor Network Theory] concepts to embrace human and nonhuman (AI) 'member organisms' located in civic, industrial, or academic domains, which can be considered stakeholders of the global music community. The term is designed to include but is not limited by the commercial boundaries of the worldwide music industry."³ Therefore, Puckette's software MAX would be included as would Herndon and her various AI voice incarnations.

¹ Hussein Boon is a principal lecturer at the University of Westminster and a member of the Black Music Research Unit. His publications include several short fiction stories about AI and popular music, and articles on the use of shift registers for songwriting, and the role of anti-aestheticism in music production education.

² Both Max and Pure Data are important visual programming tools for computer music that do not require composers to know how to code in languages like C.

³ Clancy, 178. This contrasts with the view that the music ecosystem "essentially consists of two parallel oligopolies: music platforms owned and controlled by technology companies (with Spotify, Apple, Google, and Amazon dominant across much of the world, and Tencent in China) and a recording sector with corporate rights owners." David Hesmondhalgh et al., "Digital Platforms and Infrastructure in the Realm of Culture," In *Media and Communication 11*, no. 2 (2023): 303.

Many readers will be familiar with Attali's work.⁴ In the interview, Clancy quizzes Attali concerning his predictions from 1979 and whether matters have panned out in the way he had originally imagined. Some of his predictions included the stockpiling of music,⁵ repetition as an organising principle in the increasing availability of music⁶ and "The bulk of commodity production then shifts to the production of tools allowing people to create the conditions for taking pleasure in the act of composing."⁷ Attali's interview has some parallels with Steve Cohen's interview, since both imagine a future where they are able to perform music with AI, potentially in an AI-based metaverse. Attali for instance, envisions conducting a virtual performance with a 10,000-piece orchestra,⁸ while Cohen imagines joining an AI version of Led Zeppelin on stage. Both participants exhibit a highly personalized and solipsistic perspective on AI, neglecting to consider potential harms or violations related to modeling personalities and musical compositions. Puckette's contribution highlights issues of performability and how changes in Operating Systems and computer architecture may lead to issues around archiving musical pieces. If music is composed using a particular operating system and hardware architecture, changes made by manufacturers over time to improve their systems may make it challenging to play or perform the music using up-to-date hardware due to a dependency on previous systems. Therefore, adapting the code to work on newer hardware is necessary to continue performing the work, but doing so raises questions about whether the resulting piece is the original composition or a different version. Puckette ultimately sees this as a trade-off between convenience and impermanence.

Holly Herndon's interview and Jessica Edmond's piece provide the reader with useful information and ideas to consider when evaluating AI in a musical context. Herndon introduces the concepts of derivatives and spawning.⁹ She draws a distinction between these terms by explaining that copying, whether by machine or human, needs to be evaluated as to whether it results in something new (spawn) or more of the same (derivative). Edmond's chapter considers data primarily focused in two areas: Music Recommendation systems and AI training data.¹⁰ The chapter provides much-needed clarity on these topics. Surprisingly, Edmond does not see data mining as a threat to music.¹¹ Instead, she says that machines should be allowed to "create music, even if that music seems indistinguishable from human-created

⁴ Jaques Attali, *Noise: the Political Economy of Music* (Manchester: Manchester University Press, 1985).

⁵ *Ibid.*, 32.

⁶ *Ibid.*, 136.

⁷ *Ibid.*, 145.

⁸ Clancy, *Artificial Intelligence and Music Ecosystem*, 7.

⁹ Readers are advised to visit Herndon's AI modeling initiative: "About," Have I Been Trained, accessed May 10, 2024, <https://haveibeentrained.com/about..>

¹⁰ Clancy, *Artificial Intelligence and Music Ecosystem*, 84-85.

¹¹ The Japanese government takes this position, reaffirming "that it will not enforce copyrights on data used in AI training", "Japan Goes All In: Copyright Doesn't Apply To AI Training," Ingrid Riehl, accessed May 10, 2024, <https://www.biia.com/japan-goes-all-in-copyright-doesnt-apply-to-ai-training/>.

equivalents.”¹² However, Edmond also sounds a note of caution that AI might amount to nothing more than surface illusion, especially where companies claim they “democratize creativity and access.”¹³ Ultimately, this “may merely be the appearance of these essential resources that are facilitated.”¹⁴ Edmond correctly states that technology is never neutral and that the effects of AI as assisting in the creation of music can lead to conditions of “degraded professional confidence and competence.”¹⁵ In the music ecosystem, this assistant vs. competitor dichotomy still requires proper articulation.

The role of robotics is discussed by Savery and Weinberg, who outline their five design principles: “listen like a human, play like a machine, be social, watch and learn, and wear it.”¹⁶ They are one of the few contributors to discuss the problem of AI and resources use, and advocate for “a more efficient network with reduced performance”¹⁷ as a better trade-off than currently offered by cloud-based large language models. By using smaller datasets this also reduces training time and environmental impact.¹⁸ This could become a model for future, more localized versions of AI, perhaps in home recording or small studio settings, rather than the large corporate server models in current use.¹⁹

Likewise, Clancy’s chapters appraise the current state of copyright. For his chapter on AI and Ethics, Clancy distilled his document review from a variety of organizations including industrial, academic institutes, governmental, intergovernmental and independent think tanks, to six to provide the reader with a good grounding on where matters stand²⁰. However, I would also advise the reader to read Clancy’s PhD thesis,²¹ as this also contains important information on copyright which did not make it into the book.

The book has a twofold problem. Firstly, the field is changing quickly, therefore, the book can only be considered as providing a snapshot. Secondly, critical absences include not dealing with AI harms and biases more explicitly, avoiding issues of gender and race, and not properly including implications of ventriloquism and minstrelsy, which are only referred to in the loosest of terms. Clancy’s book serves as a good overall introduction to the subject. It caters to a wide range of readers without assuming expert knowledge. However, some readers might wish for a more in-depth critique of capitalism, focusing on how it affects production conditions, tool ownership, and the process of turning raw materials into monetized products. The

¹² Clancy, *Artificial Intelligence and Music Ecosystem*, 90.

¹³ Ibid.

¹⁴ Ibid.

¹⁵ Ibid., 89.

¹⁶ Ibid., 56.

¹⁷ Ibid.

¹⁸ Ibid., 57.

¹⁹ Emma Strubell, Ananya Ganesh and Andrew McCullum, “Energy and Policy Considerations for Deep Learning in NLP,” preprint, submitted June 5, 2019, <https://doi.org/10.48550/arXiv.1906.02243> (2019).

²⁰ Clancy, *Artificial Intelligence and Music Ecosystem*, 110.

²¹ Martin Clancy, “Reflections on the Financial and Ethical Implications of Music Generated by Artificial Intelligence” (PhD diss., Trinity College Dublin, 2021).

book does not consider concepts of cloud capital and behavioral surplus²². Therefore, recommended reading to accompany Clancy's book include Dan McQuillan's *Resisting AI*,²³ Ruha Benjamin's *Race After Technology*²⁴ and Meredith Broussard's *Artificial Unintelligence*.²⁵ Even though there is widespread interest in AI, Ekaterina Svetlova reminds us that you will “hardly find a model or an algorithm that is used without a human component at one or the other stage.”²⁶ Despite the issues mentioned, the book offers a good introduction to the uses of AI in music from various practitioner perspectives. ◻

²² Shoshana Zuboff, *The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power* (London: Profile Books, 2019).

²³ Dan McQuillan, *Resisting AI* (Bristol: Bristol University Press, 2022).

²⁴ Ruha Benjamin, *Race after technology: abolitionist tools for the new Jim code* (Cambridge, England: Polity Press, 2019).

²⁵ Meredith Broussard, *Artificial Unintelligence: How Computers Misunderstand the World* (Massachusetts: MIT Press, 2019).

²⁶ Ekaterina Svetlova, “AI meets narratives: the state and future of research on expectation formation in economics and sociology,” *Socio-Economic Review* 20: 2 (2022), 841–861.