

IoT and AI-Driven Audio in the Smart City: A Rhythmanalysis inspired approach.

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French Philosopher and theorist Henri Lefebvre's *The Production of Space* (1991) has proved a crucial text for framing the discourse around contemporary urban society in the fields of human geography, critical theory, cultural studies and sound studies. With the recent wave of research focusing on the Internet of Things, the Smart City and complementary developments in the research and application of geolocative technologies another of Lefebvre's works, his posthumous collection of essays on the concept of Rhythmanalysis (2004), has increasingly come to the fore (Coletta and Kitchin, 2017). Rhythmanalysis provides a conceptual apparatus for conceptualising and understanding urban space in terms of rhythmic patterns. The foundation of Rhythmanalysis is built upon what Lefebvre describes as a Critique of the Thing which highlights the inherent shortcomings of the concept of the "thing" for describing and understanding the dynamic web of interrelations which constitute urban space. He argues instead for the "no things: very diverse rhythms, slow or lively (in relation to us)." While research unifying Rhythmanalysis with sonic practices have tended to focus on musical concepts, the authors argue that there is another interesting dimension at play here.

Artificial intelligence is proving increasingly useful for detecting patterns in, and helping to make sense of, the kinds of complex data generated by the modern IoT networks that have come to define the Smart City (Roddy, 2018). Artificial intelligence is also becoming a crucial technological tool in sound and music practices while at the same time raising interesting questions about the nature of creativity, art and the role of the machine therein. This paper explores the concept of Rhythmanalysis as a theoretical framework for the deployment of AI-driven techniques and IoT data in a live electronic music performance context. It explores the concept of disembodiment in computer music and emergence in complex systems positioning these in relation to Smart Cities, Data-driven Sound and the problem of Determinism vs Indeterminism in generative art.

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