

Sonification and the Digital Divide

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Historically, 'Western Culture' has been predominantly visuocentric tending to treat sound as an immaterial and secondary phenomenon. The roots of this bias can be traced back through the works of Kant and Hume to classical Pythagorean thought that reduces sound to the sum of its mathematical and mechanical components. Sound was often thought of as something material objects do, rather than a material object in and of itself. With the advent of 20th century analog recording technologies, sound for the first time became disembodied from its sources and worthy of treatment as a material in and of itself. This has led to interesting developments in the arts and sciences. Thanks to modern developments in digital technology sound has become a tangible, malleable material. Sonification is the process of representing computer data using digital sound. It is used in situations where the visual medium comes up short. The human ear can quantify minute changes in large multivariate data sets that the human eye cannot. Sound also provides a rich medium for the expression of qualitative data that does not lend itself well to visualization techniques. Sonification is by data scientists at NASA to study astronomical data and at CERN in the search for the Higgs Boson. This paper argues that sonification represents a vital form of material that bridges the gap between the digital and the physical worlds. It allows us to digitize and express data that is off-limits to both language and visual representation. This paper introduces a brief history of sonification before discussing some of the cognitive factors involved in the human comprehension of sound and sonifications in particular. The paper then presents some recent sonification research in the field that is pertinent to the question of digital materiality and deals with the philosophical questions that arise from the classification of sonification as digital material.