



## **Using spatial sonification for the display, exploration and communication of geoscientific datasets**

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Our representation of scientific data has to date been largely dominated by visual methods, however, driven by the explosion in big data, sonification (turning data into sound) is emerging as an innovative tool for presenting and exploring data.

Interactive spatial sonification tools, designed to preserve data accuracy, representativeness and clarity now exist (e.g. Barrett, 2016) and can potentially be used as an auditory display for scientists to analyze multidimensional data sets evolving in time. Since the human auditory system perceives patterns differently (and often more efficiently) than our eyes, the use of this medium for data analysis may offer not only a faster alternative but may reveal new patterns or processes that would otherwise remain undiscovered.

In this (audio poster) contribution, we will demonstrate the use of interactive spatial sonification, using the parameter-mapping sonification tool, Cheddar. Cheddar sonifies data in real time but allows the user to modify mapping parameters whilst listening thus more easily uncovering patterns. Spatial information is sonified in high-order 3-D ambisonics, where the user can interactively move the virtual listening position to reveal details easily missed from fixed or noninteractive spatial views. Adding an interactivity (and a playful) element allows the listener to curate their data, leading to active exploratory (and potentially more enjoyable) user experience. We will explore several geoscientific datasets including Earthquake events, Acoustic emissions and 3D Topographic data.

In addition to the obvious scientific applications, the use of sound dominant data exposition can also engage and communicate with a much wider range of audiences, including those with a visual or sensory impairment who are challenged by traditional visual or text dominant methods.