

## Music as a Composition of Cartesian Monad over a Topos

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The work to be presented builds on that presented at ANPA 37, taking up the challenge of a testing application for the Cartesian monad approach to universal design. The monad presents a musical performance as a composition over time signatures, such as barlines, with the monad looking back and its associated comonad looking forward. The physical characteristics of the notes in each time-frame are complex, so it is necessary to use a strong Cartesian monad, facilitating the representation of each time-frame as a product. The monad is process, handling dynamic aspects. The category upon which the monad operates will be a topos holding relatively static information such as the players, the score and the venue, together with the relationships between them. The topos is far from totally static with its arrows facilitating flexibility in all information held, including relationships; the topos is also searchable through the subobject classifier. There is no assumption of any particular musical genre. Such a categorial framework could be implemented in the functional programming language Haskell in a similar way to the banking example.