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PARAMETER MAPPING SONIFICATION (PM SON) OF PELVIS IN GAIT, FOR THE PURPOSE OF DEVELOPING SYMMETRICAL GAIT BEHAVIOURS.

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This study seeks to transfer pelvic movement characteristics in gait, to a sound design that appeals intuitively to a participant, and that aspires to map precisely and obviously (even subconsciously) to their cognition in recognising a clear association between the anatomical body part and its corresponding sound. The materials of the study use movement data taken from three-planar gait analysis, using an optical measuring system [the BTS Smart] (Jochymczyk-Woźniak, Katarzyna, et al. 2019). Dimensions of gait activity in the pelvis have been tracked in pelvic (transversal) rotation, (coronal) obliquity and (sagittal) tilt.

Parameter Mapping Sonification (PMSon) is the process of utilising the dimension of sound to reveal aspects of other, non-sonic dimensions. Famous examples of this, where one form of energy is transferred to sound in order to make use of auditory benefits, are the whistle from a kettle (= 100°C), the ticking noise of a clock to represent time, or a Geiger counter sound used to detect and measure ionizing radiation. Auditory feedback is essentially a form of sonification, and this can be a facility for raising awareness to biological factors of our bodies, and motor behaviour. Many studies have explored the various forms of sonification (Audification, Auditory Icons, Earcons, Parameter Mapping Sonification, and Model-Based Sonification - Hermann, et al. 2011), which can evidence effective uses in a broad range of movement activities (cf. Schaffert, et al. 2019). Furthermore there are numerous examples where effective movement characteristics have been implemented to a sonic dimension, which follow a careful and logical transference of energy that can become intuitive to the beneficiary (Dubus, & Bresin, 2013).

The 3 dimensional re-modelling of the pelvis movements, collating the three data sets of rotation, obliquity and tilt are taken as graphs and transferred into a range of sound characteristics, such as amplitude, pitch, and various filters (e.g. low and high pass). With a degree of 'Foley' sound manipulation and creativity, there is the added goal of producing something realistic, or even *hyper-real*, for the sake of appealing to human appraisal and affiliation. The study seeks to trial the sonic results on a range of participants to measure psychological and physiological responses ascertaining to what extent the PMSon works, how well pelvic movement relates to the sound, and to what extent this is fit for application in a larger-scale study for controlling movement behaviour.



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