Review of: "Turning the Tables on Analysing Turns – Validation of Wearable Sensors in Ballet"

David V. Thiel[1]

1 Griffith University

The Abstract says "Therefore, coupled with the gap in the literature about wearable technology, specifically wearable sensors, in ballet, there exists a need to determine whether wearable technology can be applied in the performing arts environment." I am concerned that the authors have not cited the papers by Gene Moyle (Qld Ballet) et al. ("An Assessment of Postural Sway in Ballet Dancers During First Position, Relevé and Sauté with Accelerometers" 2016: & "Accelerometer based performance assessment of basic routines in classical ballet" 2014), where wearable sensors were used. Her publications include a lot of work on ballet dancer injuries and other health-related issues. The EMG electrode study of Mira et al. 2019 is also relevant.

There are also many papers on the use of motion capture in ballet (Charbonnier et al., 2011; Chang & Park, 2023; Laskowitz & Muller, 2024; and many more).

The results claim a Pearson's correlation coefficient of $r = 1.00$, a near-perfect score, but the paper does not outline what was measured. Motion capture gives 3D spatial position, and from this, the velocity and acceleration can be determined mathematically. Perhaps this acceleration was matched to the accelerometer output? But there still remains the static gravitational coefficient which must be removed in all three acceleration axes from the wearable unit before such a comparison can be made. Thus, the method of fixing the accelerometer to the leotard is not likely to start with one axis in the precisely vertical position, and during the movement, the material is likely to stretch, so upsetting the initial calibration.

The paper can be improved by addressing these issues and showing some raw data where the timing was determined.