Contribution ID: **567** Type: **Poster**

Motor signatures of Digital Intentions: A 3D analysis of typing movement on the smartphone

Thursday, September 11, 2025 2:10 PM (20 minutes)

Touchscreen interactions require complex motor coordination, particularly of the thumbs. This study investigates the kinematic differences underlying two classes of digital intention: content consumption and content generation. Eighteen naïve participants were instructed to type standardized sentences on Google and WhatsApp, respectively representing the two digital intentions. Thumb trajectories were recorded through a 3D motion capture system (8-camera infrared setup, 100 Hz), with reflective markers placed on key anatomical landmarks of both thumbs and wrist. To systematically quantify motor behavior, we developed a novel 3D reference model—Dance of Thumbs (DoT). The DoT model captures spatial displacement, velocity peaks, temporal parameters. Preprocessing and analysis were carried out using a custom MATLAB script, which included temporal segmentation and spatial displacement of kinematic data. Results demonstrate statistically significant differences in spatiotemporal parameters between the two groups: Digital natives (born after 1980) showed higher movement regularity and efficiency across both tasks, suggesting sensorimotor optimization through habitual touchscreen use. The DoT model provides a robust framework for quantifying fine motor dynamics in digital contexts. These results reveal motor markers of digital intention and support the integration of kinematic analysis into broader contexts of digital behaviour and competence.

If you're submitting a symposium talk, what's the symposium title?

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Session Classification: Lunch and poster 1

Track Classification: Action and movement