

Quantifying tactile perception of fabrics using both frictional and acoustic methods

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Skin friction underpins tactile perception of formulated products, such as cosmetics, fabric softeners, and surface coatings, which are designed to deliver satisfactory tactile sensory properties. Establishing the correlation between the tribological properties of skin contacts and tactile perception is therefore critical. We have developed a novel approach to acquire the acoustic emission (AE) signal generated by human finger sliding against fabric and non-fabric substrates, whilst capturing its frictional characteristics with a force plate. Principal Component Analysis was deployed to construct clusters formed for each material based the sensory evaluation, and to establish the correlation between frictional and acoustic emission data. Our results show that the planar solid substrates could be discriminated solely based on the friction results, whilst the fabric materials were not significantly discriminated by the Coefficient of Friction values. However, AE was able to differentiate the fabric substrates successfully, and therefore evidences a promising potential to provide a complementary information on tactile perception while being versatile enough to be used as a standalone method to quantify tactile perception in a broad range of tribological measurements.

Keywords:

Tactile Perception, Skin Tribology, Acoustic Emission

References:

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