
Distributed occupant-seat interactions as an objective measure of seating comfort

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Abstract: An automotive seat must provide the occupant with a comfortable environment in which driving can be performed in a safe and comfortable manner. The characterisation of the interactions between the occupant and the seat under various conditions thus constitutes an important goal for enhancing the knowledge of essential design factors that could yield improved seating comfort. This paper investigates the occupant-seat interactions through measurements and analyses of the distributed contact force, contact area and peak and mean pressure responses at the body-seat-pan and body-backrest interfaces of three different automotive seats. User's perceived comfort levels for various seating configurations were acquired through a survey and results were analysed through analytical hierarchy process (AHP) in order to derive a quantitative expression for the perceived comfort level. A strong correlation between perceived comfort and the peak and mean pressures on the seat-pan enabled us to derive an explicit formulation of seating comfort.

Keywords: automobile seat design; objective measure of seating comfort; occupant-seat interaction; perceived comfort; multi-criteria evaluations; analytical hierarchy process.

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