Automotive Emotions: An Investigation of Their Natures, Frequencies of Occurrence and Causes

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Abstract : Technological and sociological developments in the automotive sector are shifting the focus of design towards developing a better understanding of driver needs, desires and emotions. Human centred design methods are being more frequently applied to automotive research, including the use of systems to detect human emotions in real-time. One method for a non-contact measurement of emotion with low intrusiveness is Facial-Expression Analysis (FEA). This paper describes a research study investigating emotional responses of 22 participants in a naturalistic driving environment by applying a multi-method approach. The research explored the possibility to investigate emotional responses and their frequencies during naturalistic driving through real-time FEA. Observational analysis was conducted to assign causes to the collected emotional responses. In total, 730 emotional responses were measured in the collective study time of 440 minutes. Causes were assigned to 92% of the measured emotional responses. This research establishes and validates a methodology for the study of emotions and their causes in the driving environment through which systems and factors causing positive and negative emotional effects can be identified.