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## Evaluation of Ride Comfort using Facial-Expression Analysis Models

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**Summary:** The authors have elaborated an evaluation method of ride quality using facial expression. They introduced the concept of Fourier Descriptor (FD) to characterise the outline of facial factors such as eyes and mouth. Two facial-expression analysis models were proposed so as to relate one's facial expression with his/her psychological state as fundamental emotions. One was modelled for estimating subjects' own emotion from their facial expression. The discriminant analysis was applied to classify facial expressions into the six fundamental emotions, and the optimised model with a comparatively small number of FDs could discriminate them with a high discrimination rate. The other was modelled for estimating emotions by other people from subjects' facial expression. Fuzzy measure theory was here introduced to model human ambiguous judgement in evaluation. In this paper, these facial-expression analysis models were applied to subjects' facial expressions who actually felt sick in motion-exposure experiments using a ship-motion simulator and in a high-speed passenger craft. To conclude, facial expression can be an objective physiological index of motion sickness and the proposed models were found to be useful to evaluate ride comfort from facial expression.

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