



**DEVELOPMENT OF A MUSCLE FATIGUE INDEX FOR MOTORCYCLIST
IN
PROLONGED RIDING**


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“ I declared that this thesis is the result of my own work except the ideas and summaries which I have clarified their sources. The thesis has not been accepted for any degree and is not concurrently submitted in candidature of any degree. ”

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ABSTRACT

For prolonged motorcycling, it is very common for motorcyclist to experience physiological discomfort such as muscular numbness or strain. These symptoms are known as muscular fatigue and upon continuous occurrences may leads to road accident as reported by a study. Muscular fatigue could be described as a condition where the ability of the skeletal muscle system to exert maximum action is reduced. The objective of this study was to establish a new index system to evaluate muscular fatigue. In determining motorcyclist's perception towards discomfort that leads to muscular fatigue during prolonged motorcycling, survey research using the questionnaire tool were performed among the undergraduate students from the Faculty of Mechanical Engineering, Universiti Teknologi MARA Shah Alam. The questionnaires were analyzed via Statistical Package Service and Solution (SPSS) with the level of confidence of 95% (1.96), expected proportion of 0.5 and the precision at 0.1. From the questionnaires, a specialized discomfort rating index system of various body regions for motorcycling named Motorcycling Fatigue Hazard Indexing Scale (MoFaHS) were established. The index system allows for the muscular fatigue evaluation of most major body region which are affected during motorcycling to be performed. The following body regions were identified to be the most severely affected (high muscular fatigue rating index): (i) neck/shoulder, (ii) upper back, (iii) lower back, and (iv) buttock. From here, the muscular activities of selected muscles that best represent these body regions were further analyzed via surface electromyography (sEMG) measurement. The data was tabulated and published in two International Ergonomics Conferences as chapter in books. The sEMG measurements were performed on a newly established and award winning Postura Motergo motorcycle test rig setup (bronze medal in the Invention, Innovation and Design Exposition 2014 (IIDEX2014)). With the establishment of the MoFaHS, muscular fatigue could now be quantitatively evaluated.

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