UNIVERSITI TEKNOLOGI MARA

THE DEVELOPMENT OF MOTORCYCLE RED LIGHT RUNNER CONFLICT RISK ESTIMATION MODEL (MoRCE) AT SIGNALISED INTERSECTIONS USING STOCHASTIC PETRI NETS

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ABSTRACT

In Malaysia, the motorcycle is the higher demand of transportations mode and its impact is regarded as one of factors of motorcycle crashes. Among these crashes, red light runner (RLR) contributes the frequency of crashes happened in Malaysia. It represents a significant safety problem that should deserve a through attention. Therefore, the aim of this study is to tackle this problem by developing a motorcycle RLR assessment model. This model was integrated from the influencing factors at signalised intersection in Shah Alam, Selangor using Stochastic Petri Nets (SPN) approach. The process in developing the model started with direct observations using video recorder at the sites study. Signalised intersection at Section 7, Persiaran Kayangan was chosen as sites study. It was done to understand the conflict event sequences of motorcycle. The conflict event sequences were translated into SPN elements for the model development. The developed model is called MoRCE (motorcycle RLR of conflict risk estimation) model. Three categories factors such as human behaviours, engineering and environmental were identified as the model parameters. Whereas, it divided into human behaviours, traffic volume, numbers of lanes, approaching speed, weather, amber phase change interval, signal phase timing and cycle length. The result showed that these model parameters influence the RLR motorcyclist. Validation of MoRCE model by comparing the conflict risk values of actual and predicted model was successful and accepted. The comparison was conducted on 14 signalised intersections in Shah Alam, Selangor through Chi-square test. The test indicated that the conflict risk values from MoRCE model and those from the sites followed the same distribution trend.

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