# 應用駕駛模擬器與模糊理論於大客車駕駛行為之分析

張建彥,游逸倫
運輸科技與物流管理學系
管理學院

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## 摘要

This study utilized a bus driving simulator to conduct a car following and brake behavior experiment of the bus drivers. The experimental data were collected, and a fuzzy set theory was used to analyze the data and develop the models of car following and brake reaction. Since the input variables which affect car following behavior and emergency brake reaction include speed difference and spacing between the lead vehicle and the following vehicle, and the speed of the following vehicle, and the output variables are acceleration (or deceleration) in car following and perception-reaction time and deceleration in brake reaction, the fuzzy set model developed by this study defined speed difference, spacing and speed as input variables, and acceleration (or deceleration) as the output variable of the car following model, and perception-reaction time and deceleration as the ones of the brake model. Through the analysis of membership function, inference logic toolbox and defuzzification, the inference rules of inputs and outputs were established. In order to verify and validate the reasonableness of the model, this study also applied a statistical test to the difference analysis of the estimated value and the experimental value. This study finally developed four kinds of car following model and one kind of emergency brake model. Results of this study could be used as a base to develop the bus simulation model and the bus forward collision warning system.

關鍵字：Bus Driving Simulator, Fuzzy Set Theory, Car Following, Brake Reaction, Forward Collision Warning System.