

整合駕駛模擬器與即時臉部凝視追蹤系統應用於視覺能力之分析

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摘要

The influence factors to vehicle driving safety could be divided into two parts: physical factors and psychological factors. In physical factors, visual ability is the most important characteristic to safe driving. The visual ability defect is usually the major factor of driving safety decreasing. Therefore, the effective measurement of visual ability condition and its influence to driving safety has become an important issue. In addition to the visual ability checklist table and visual field testing equipment, the integration of the visual ability tracking measurement equipment and the driving simulator's virtual reality technology has also become an important technology in the visual ability measurement tools or methods. This study integrates a face and eyes tracking system (faceLAB system) and a driving simulator to design the simulation scenario that randomly appears different events for experimental participants to response. The influence of experimental participants' visual ability to driving behavior reaction has been analyzed. Twenty experimental participants were divided into four groups according to visual ability condition. Fifteen participants were classified into the myopia with glasses group, the myopia with contact lenses group and the presbyopia group. The other five participants were classified into the normal visual ability group. The reaction time and visual field data of each experimental participant's response to the randomly events in the driving simulation scenario were collected to analyze the visual influence. Results showed that drivers with different visual ability (normal visual ability, myopia with glasses, myopia with contact lenses and presbyopia) have different reaction time and visual fields. This study could be a useful basis for driving safety analysis under different visual ability conditions.

關鍵字：Driving Safety, Visual Ability, faceLAB System, Driving Simulator.