無人控制二輪車輛之穩定性實驗研究

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摘 要

本研究藉由實驗結果去證實下列問題： 若我們擁有數台二輪車輛，要如何藉由實驗去找出那一輛車擁有較佳的行駛穩定性？。某些二輪車輛相關的振動模態(vibration mode)會與二輪車輛的穩定性有關，例如：傾覆(capsize)模式、搖擺(weave)模式、及晃動(wobble)模式等。而在本研究中，我們則是採用自行車作為研究二輪車輛穩定性的對象。 在本研究測試系統之實驗中選取轉向角(steering angle)、車輛傾角(vehicle roll)、偏擺角(yaw angle)和前行速度(forward speed)等數據。利用商用軟體LabVIEW(Laboratory Virtual Instrumentation Engineering Workbench)與非線性曲線崁合(nonlinear curve fitting)功能進行數據擷取和數據分析之工作。利用上述量測之參數以判定自行車的穩定性。 在本研究中，我們測試了兩種不同狀態的自行車，把測量結果放在一起比較，找出哪一個更具穩定性。此外，我們還使用了Vu Anh Van [20]的自行車理論來驗證實驗的結果。而二輪車輛的相關發展的完整系統也在此被提出來討論。

關鍵詞 : 自行車動態、二輪車輛穩定性、實驗量測、曲線崁合

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