行人有限元素模型之建立

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摘 要

汽車撞擊行人造成的傷害佔了交通事故傷亡人數很大的比 例，因此行人安全防護在各國汽車安全性研究已日漸受到重視。使用有限元素理論建立行人模型，可以在電腦中虛擬地呈現 行人與車輛碰撞的各種反應，從而把握行人在碰撞後的運動情 況以及傷害情況。故本論文首先採用LD-DYNA 分析軟體建構可 變形的有限元素行人模型；並分別以25, 32 及40 km/hr 不同 碰撞速度衝擊有限元素行人模型，探討行人模型頭部、骨盆， 膝蓋及足部各部位之位移動態軌跡以及頭部速度結果，並藉由 死屍實驗來驗證本論文建構有限元素行人模型之正確性；另外 本研究亦藉由車輛撞擊行人數值模擬對行人頭部、小腿、大腿 、胸部、頸部及骨盆等部位進行損傷分析。採用本論文建立之 行人數值模型進行車輛碰撞行人事故模擬與損傷分析，可準確 地評價車輛在行人保護方面的性能，更為未來車體結構及行人 安全防護裝備之設計參考。

關鍵詞 : 可變形行人模型，行人損傷，行人防護，車輛-行人撞擊，全尺寸行人模型

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