

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

目錄

COVER CREDENTIAL AUTHORIZATION LETTER	iii	ABSTRACT	iv
ACKNOWLEDGMENTS	v	TABLE OF CONTENTS	vii
.....	x	TABLE OF FIGURES	
.....	xiii	LIST OF TABLES	
Chapter I INTRODUCTION	1	Chapter I INTRODUCTION	1
1.1 Motivation	1	1.1 Motivation	1
1.2 Literature survey	5	1.2 Literature survey	5
1.3 The purpose of this study	11	1.3 The purpose of this study	11
1.4 The structure of this thesis	11	1.4 The structure of this thesis	11
Chapter II ASSESSMENT METHOD OF PEDESTRIAN FRIENDLINESS OF VEHICLE	25	Chapter II ASSESSMENT METHOD OF PEDESTRIAN FRIENDLINESS OF VEHICLE	25
2.1 Impactor method	25	2.1 Impactor method	25
2.1.1 Headform to Bonnet Top Test	25	2.1.1 Headform to Bonnet Top Test	25
a) Purpose	25	a) Purpose	25
b) Certification Tests of Headform Impactor	26	b) Certification Tests of Headform Impactor	26
c) Test Procedure	26	c) Test Procedure	26
d) Head Injury Criterion Definition	26	d) Head Injury Criterion Definition	26
2.1.2 Upper Legform to Bonnet Leading Edge Test	27	2.1.2 Upper Legform to Bonnet Leading Edge Test	27
a) Purpose	27	a) Purpose	27
b) Certification Test of Upper Legform Impactor	27	b) Certification Test of Upper Legform Impactor	27
c) Test Procedure	27	c) Test Procedure	27
2.1.3 Legform to Bumper Test	28	2.1.3 Legform to Bumper Test	28
a) Purpose	28	a) Purpose	28
b) Certification Test of Upper Legform Impactor	29	b) Certification Test of Upper Legform Impactor	29
c) Test Procedure	29	c) Test Procedure	29
2.2 Full scale pedestrian model method	29	2.2 Full scale pedestrian model method	29
2.2.1 PMHS corridor for vehicle	29	2.2.1 PMHS corridor for vehicle	29
2.2.2 PMHS trajectory corridor of body segments of pedestrian model	30	2.2.2 PMHS trajectory corridor of body segments of pedestrian model	30
2.3 Injuries criterion for pedestrian injuries evaluation	31	2.3 Injuries criterion for pedestrian injuries evaluation	31
Chapter III FINITE ELEMENT MODEL OF PEDESTRIAN AND VEHICLE	43	Chapter III FINITE ELEMENT MODEL OF PEDESTRIAN AND VEHICLE	43
3.1 Pedestrian model	43	3.1 Pedestrian model	43
3.1.1 Head	44	3.1.1 Head	44
3.1.2 Neck	44	3.1.2 Neck	44
3.1.3 Clavicle	44	3.1.3 Clavicle	44
3.1.4 Arms	45	3.1.4 Arms	45
3.1.5 Chest	45	3.1.5 Chest	45
3.1.6 Abdomen	45	3.1.6 Abdomen	45
3.1.7 Pelvis	46	3.1.7 Pelvis	46
3.1.8 Hip joint	46	3.1.8 Hip joint	46
3.1.9 Thigh	47	3.1.9 Thigh	47
3.1.10 Knee	47	3.1.10 Knee	47
3.1.11 Leg	48	3.1.11 Leg	48
3.1.12 Ankle joint	48	3.1.12 Ankle joint	48
3.1.13 Foot	48	3.1.13 Foot	48
3.1.14 Contact interaction	49	3.1.14 Contact interaction	49
3.2 Finite element car model	49	3.2 Finite element car model	49
Chapter IV PEDESTRIAN MODEL VALIDATION RESULT AND DISCUSSION	61	Chapter IV PEDESTRIAN MODEL VALIDATION RESULT AND DISCUSSION	61
4.1 PMHS validation result	61	4.1 PMHS validation result	61
4.2 Kinematics of pedestrian in impact with vehicle	62	4.2 Kinematics of pedestrian in impact with vehicle	62
4.3 How to apply the current pedestrian model	63	4.3 How to apply the current pedestrian model	63
Chapter V PEDESTRIAN INJURIES ANALYSIS	71	Chapter V PEDESTRIAN INJURIES ANALYSIS	71
5.1 Impact environment	71	5.1 Impact environment	71
5.2 Deformable car model	71	5.2 Deformable car model	71
5.3 Injuries analysis	71	5.3 Injuries analysis	71
5.3.1 Head injury	72	5.3.1 Head injury	72
5.3.2 Neck injury	72	5.3.2 Neck injury	72
5.3.3 Chest injury	73	5.3.3 Chest injury	73
5.3.4 Waist injury	74	5.3.4 Waist injury	74
5.3.5 Pelvis injury	75	5.3.5 Pelvis injury	75
5.3.6 Femur injury	76	5.3.6 Femur injury	76
5.3.7 Tibia injury	76	5.3.7 Tibia injury	76
5.3.8 Knee injury	77	5.3.8 Knee injury	77
5.3.9 Ankle injury	78	5.3.9 Ankle injury	78
5.4 The effect of front shape of car on the injuries of pedestrian model	79	5.4 The effect of front shape of car on the injuries of pedestrian model	79
5.4.1 The effect of front shape on the pelvis injury	79	5.4.1 The effect of front shape on the pelvis injury	79
5.4.2 The effect of leading edge shape on the femur injury	80	5.4.2 The effect of leading edge shape on the femur injury	80
5.4.3 The effect of bumper shape on the tibia injury	80	5.4.3 The effect of bumper shape on the tibia injury	80
5.4.4 The effect of bumper shape on the knee injury	80	5.4.4 The effect of bumper shape on the knee injury	80
5.5 Summarizations	81	5.5 Summarizations	81
Chapter VI CONCLUSIONS AND FURTHER STUDIES	98	Chapter VI CONCLUSIONS AND FURTHER STUDIES	98
6.1 Conclusions	98	6.1 Conclusions	98
6.2 Further studies	99	6.2 Further studies	99
REFERENCES	100	REFERENCES	100

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