FUZZY CONTROL ON VEHICLE ACTIVE SUSPENSION SYSTEM

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BACHELOR OF ENGINEERING
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UNIVERSITI MALAYSIA PAHANG

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UNIVERSITI MALAYSIA PAHANG

FACULTY OF MECHANICAL ENGINEERING

We certify that the project entitled "Fuzzy *Control on Vehicle Active Suspension System*" is written by *Muhamad Nazmi Bin Ahmad Nazari*. We have examined the final copy of this project and in our opinion; it is fully adequate in terms of scope and quality for the award of the degree of Bachelor of Engineering. We herewith recommend that it be accepted in partial fulfillment of the requirements for the degree of Bachelor of Mechanical Engineering

Dr Gigih Priyandoko

Examiner Signature

FUZZY CONTROL ON VEHICLE ACTIVE SUSPENSION SYSTEM

MUHAMAD NAZMI BIN AHMAD NAZARI

Thesis submitted in fulfillment of the requirements
for the award of the degree of
Bachelor of Mechanical Engineering

Faculty of Mechanical Engineering
UNIVERSITI MALAYSIA PAHANG

DECEMBER 2010

SUPERVISOR'S DECLARATION

I hereby declare that I have checked this project and in my opinion, this project is adequate in terms of scope and quality for the award of the degree of Bachelor of Mechanical Engineering

Signature
Name of Supervisor: Muhammad Hatifi Bin Haji Mansor
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STUDENT'S DECLARATION

I hereby declare that the work in this project is my own except for quotations and summaries which have been duly acknowledged. The project has not been accepted for any degree and is not concurrently submitted for award of other degree.

Signature
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LIST OF SYMBOLS

ω	Circular Natural Frequency
m_1	Sprung Mass
m_2	Unsprung Mass
c_1	Sprung Mass Damping Coefficient
k_1	Suspension Spring Constant
k_2	Tire Spring Rate
Δ	Determinant
$\ddot{x}$	Acceleration
$\dot{x}$	Velocity
x	Displacement
f_n	Natural Frequency
t	Time
F	Force
w	Road Profile
K_p	Proportional Gain
K_i	Derivative Gain
K_d	Integral Gain
g	Acceleration Due To Gravity
l	Distances Of The Suspension Locations
θ	Rotary Angle Of The Vehicle Body At The Centre Of Gravity.

LIST OF ABBREVIATIONS

PID	Proportional-Integral-Derivative
FLC	Fuzzy Logic Control
DOF	Degree Of Freedom
PI	Proportional- Integral
P	Proportional
C-o-A	Center-Of-Area
C-o-M	Center-Of-Maximum
M-o-M	Mean-Of-Maximum
trimf	Triangular Membership Function
trapmf	Trapezoidal Membership Function
gaussmf	Gaussian Membership Function
gbellmf	Generalized Bell Membership Function
EOM	Equations Of Motion
CST	Control System Toolbox
VS	Very Small
S	Small
M	Medium
L	Large
VL	Very Large