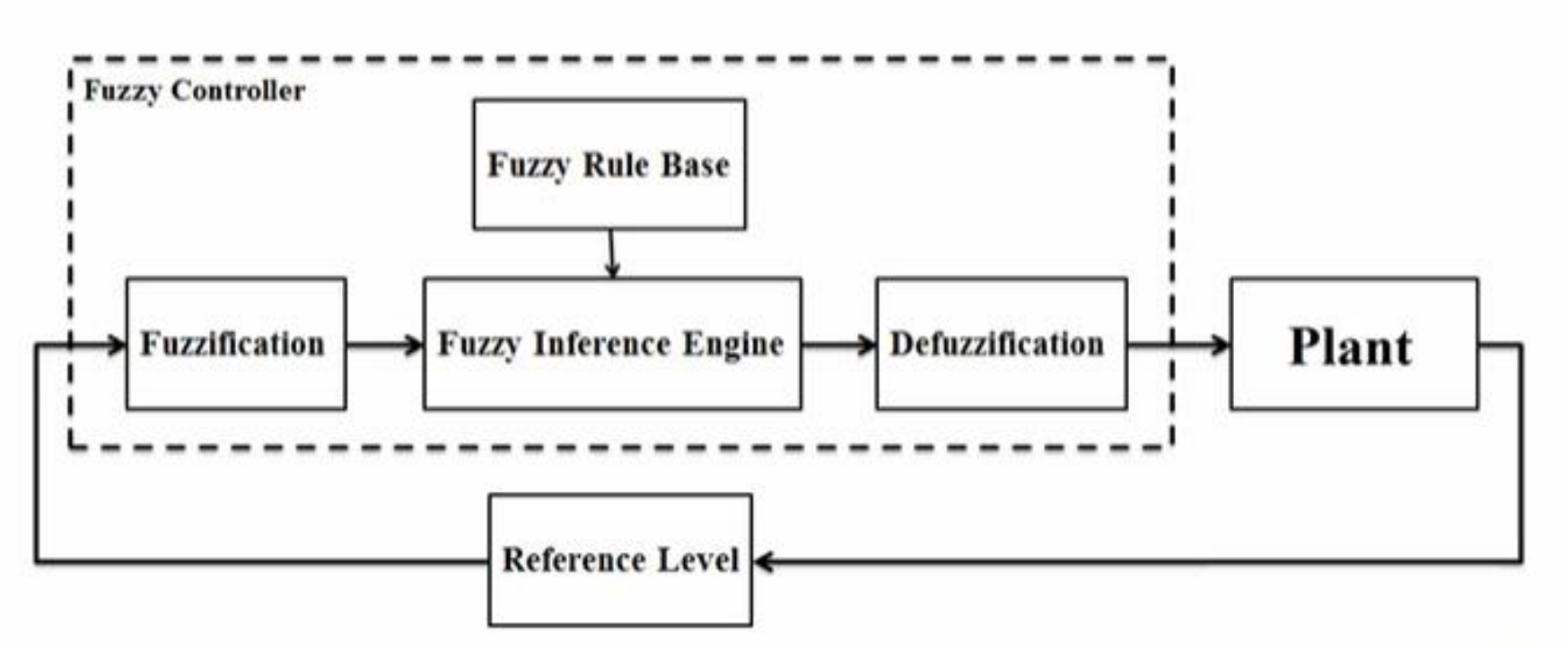
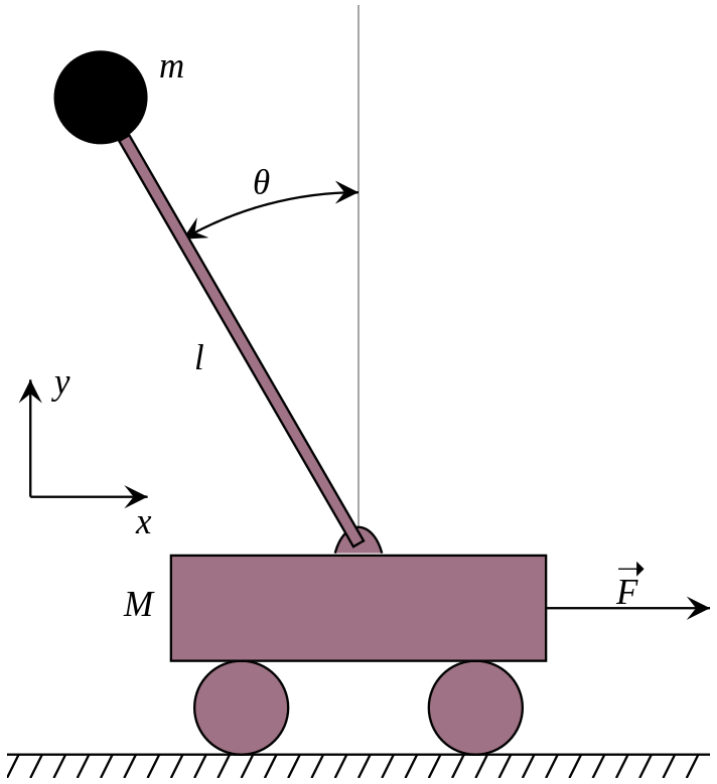
FUZZY SYSTEM EXAMPLE

FUZZY CONTROLLER



INVERTED PENDULUM



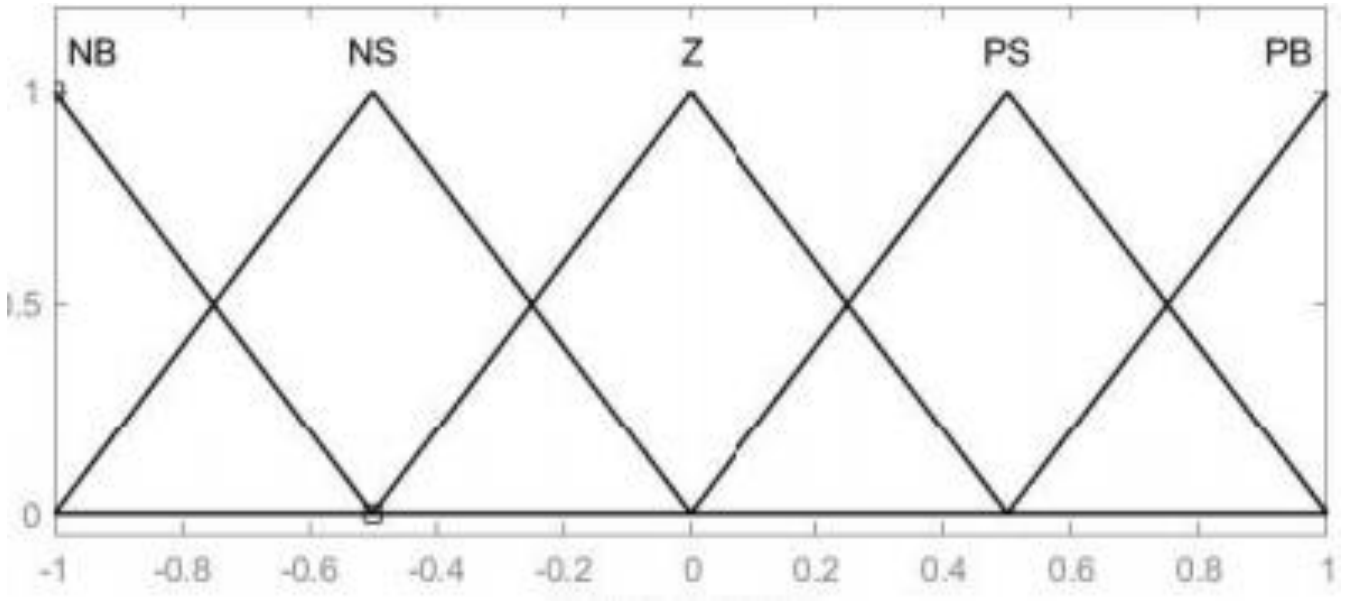
$$\dot{x_1} = x_2$$

$$\dot{x_2} = \frac{\text{-}mgsin(x_3)cos(x_3) + mlx_4^2 sin(x_3) + f_\theta m x_4 cos(x_3) + F}{M + (1 \text{-} cos(x_3)^2)m}$$

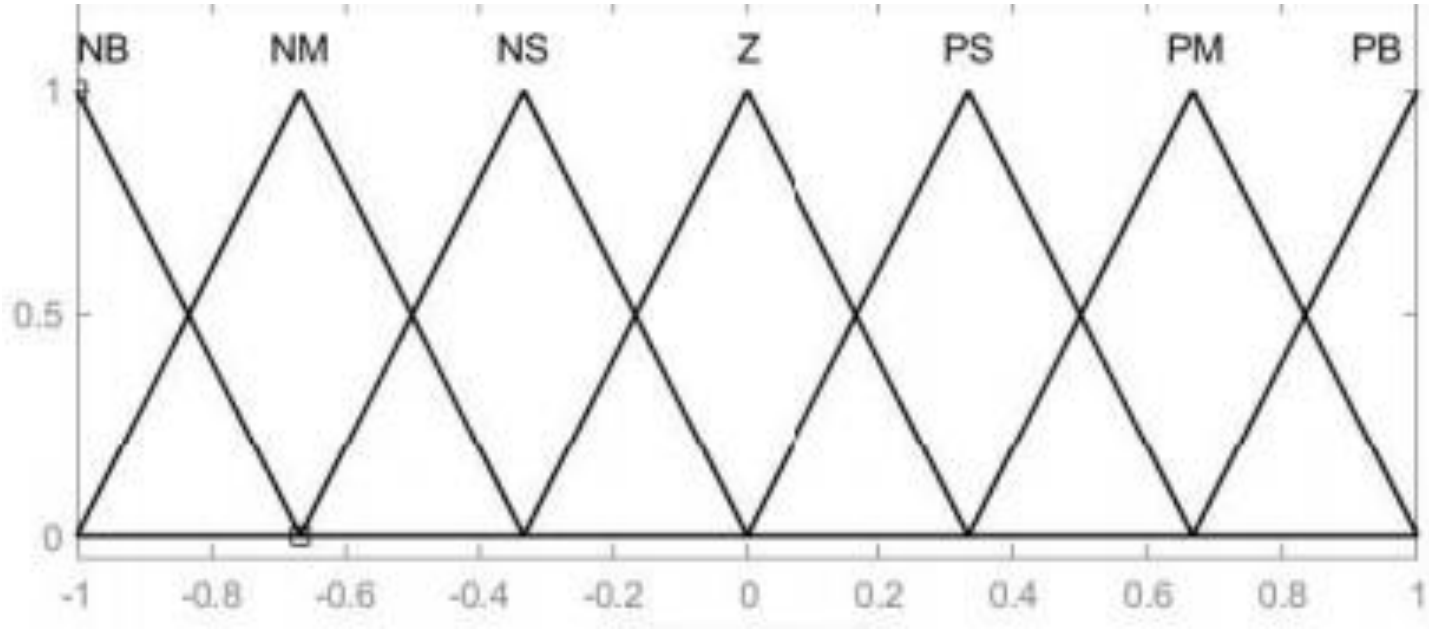
$$\dot{x_3} = x_4$$

$$\dot{x_4} = \frac{(M + m)(gsin(x_3) \text{-} f_\theta x_4) \text{-} (lmx_4^2 sin(x_3) + F)cos(x_3)}{l(M + (1 \text{-} cos(x_3)^2)m)}$$

MEMBERSHIP FUNCTION FOR INPUTS



MEMBERSHIP FUNCTION FOR OUTPUT



FUZZY RULES

$\Delta e/e$	NB	NS	Z	PS	PB
NB	NB	NM	NS	NS	Z
NS	NM	NS	NS	Z	PS
Z	NS	NS	Z	PS	PS
PS	NS	Z	PS	PS	PM
PB	Z	PS	PS	PM	PB

THANKS FOR YOUR ATTENTION