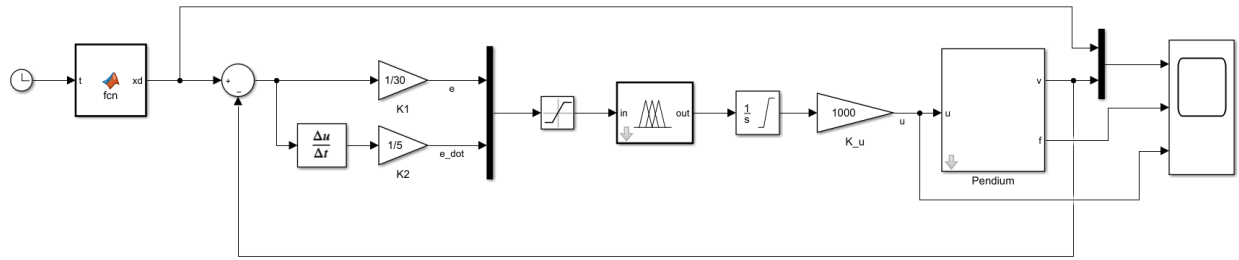
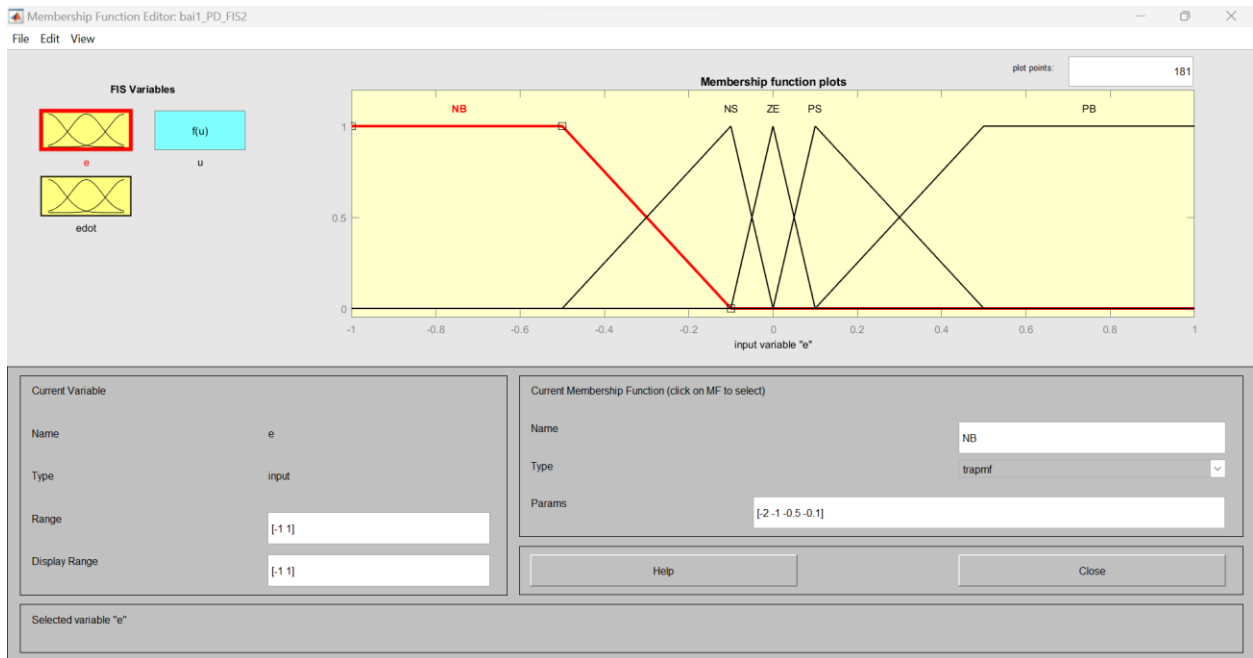


## Bài 2: Mô phỏng Simulink kiểm chứng kết quả

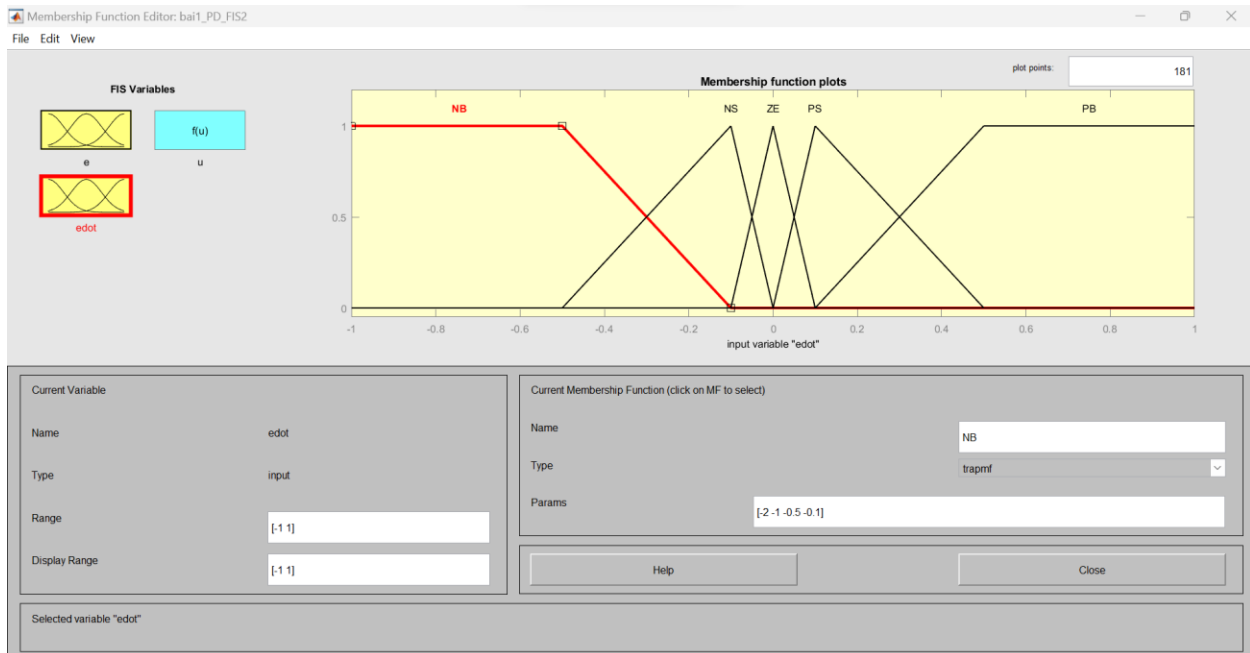


Hình 1: Sơ đồ Simulink

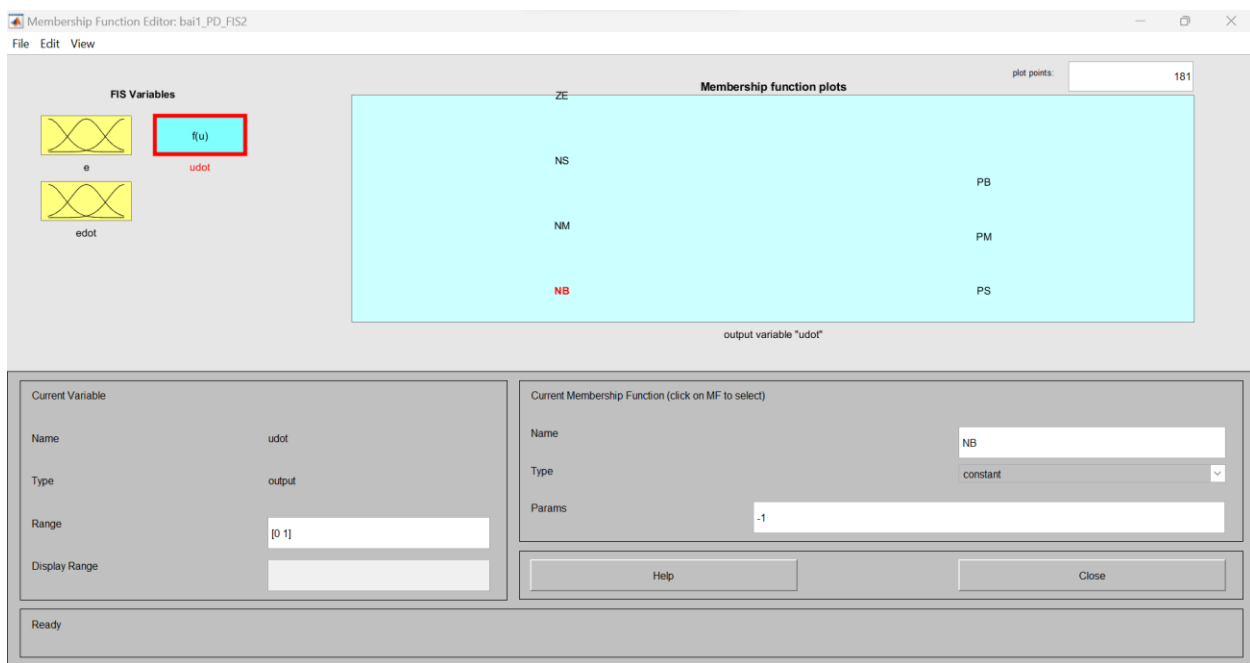
- Mô phỏng hệ thống điều khiển với  $K_1 = 1/30$ ,  $K_2 = 1/20$ ,  $K_u = 1000$ ,  $c_1 = 0.1$ ,  $c_2 = 0.5$ ,  $c_3 = 0.1$ ,  $c_4 = 0.5$ ,  $c_5 = 0.33$ ,  $c_6 = 0.66$



Hình 2: Hàm liên thuộc sai số vận tốc ( $e$ )




Hình 3: Hàm liên thuộc biến thiên sai số vận tốc ( $edot$ )



Hình 4: Hàm liên thuộc lực điều khiển xe ( $udot$ )

1. If (e is NB) and (edot is NB) then (u is NB) (1)	9. If (e is NS) and (edot is PS) then (u is ZE) (1)
2. If (e is NB) and (edot is NS) then (u is NB) (1)	10. If (e is NS) and (edot is PB) then (u is PS) (1)
3. If (e is NB) and (edot is ZE) then (u is NM) (1)	11. If (e is ZE) and (edot is NB) then (u is NM) (1)
4. If (e is NB) and (edot is PS) then (u is NS) (1)	12. If (e is ZE) and (edot is NS) then (u is NS) (1)
5. If (e is NB) and (edot is PB) then (u is ZE) (1)	13. If (e is ZE) and (edot is ZE) then (u is ZE) (1)
6. If (e is NS) and (edot is NB) then (u is NB) (1)	14. If (e is ZE) and (edot is PS) then (u is PS) (1)
7. If (e is NS) and (edot is NS) then (u is NM) (1)	15. If (e is ZE) and (edot is PB) then (u is PM) (1)
8. If (e is NS) and (edot is ZE) then (u is NS) (1)	16. If (e is PS) and (edot is NB) then (u is NS) (1)
9. If (e is NS) and (edot is PS) then (u is ZE) (1)	17. If (e is PS) and (edot is NS) then (u is ZE) (1)
10. If (e is NS) and (edot is PB) then (u is PS) (1)	18. If (e is PS) and (edot is ZE) then (u is PS) (1)
11. If (e is ZE) and (edot is NB) then (u is NM) (1)	19. If (e is PS) and (edot is PS) then (u is PM) (1)
12. If (e is ZE) and (edot is NS) then (u is NS) (1)	20. If (e is PS) and (edot is PB) then (u is PB) (1)
13. If (e is ZE) and (edot is ZE) then (u is ZE) (1)	21. If (e is PB) and (edot is NB) then (u is ZE) (1)
14. If (e is ZE) and (edot is PS) then (u is PS) (1)	22. If (e is PB) and (edot is NS) then (u is PS) (1)
15. If (e is ZE) and (edot is PB) then (u is PM) (1)	23. If (e is PB) and (edot is ZE) then (u is PM) (1)
16. If (e is PS) and (edot is NB) then (u is NS) (1)	24. If (e is PB) and (edot is PS) then (u is PB) (1)
17. If (e is PS) and (edot is NS) then (u is ZE) (1)	25. If (e is PB) and (edot is PB) then (u is PB) (1)

Hình 5: Các qui tắc điều khiển


Block Parameters: Pendium

Subsystem (mask)

Parameters

m 1300

Ap 0.3

d 100

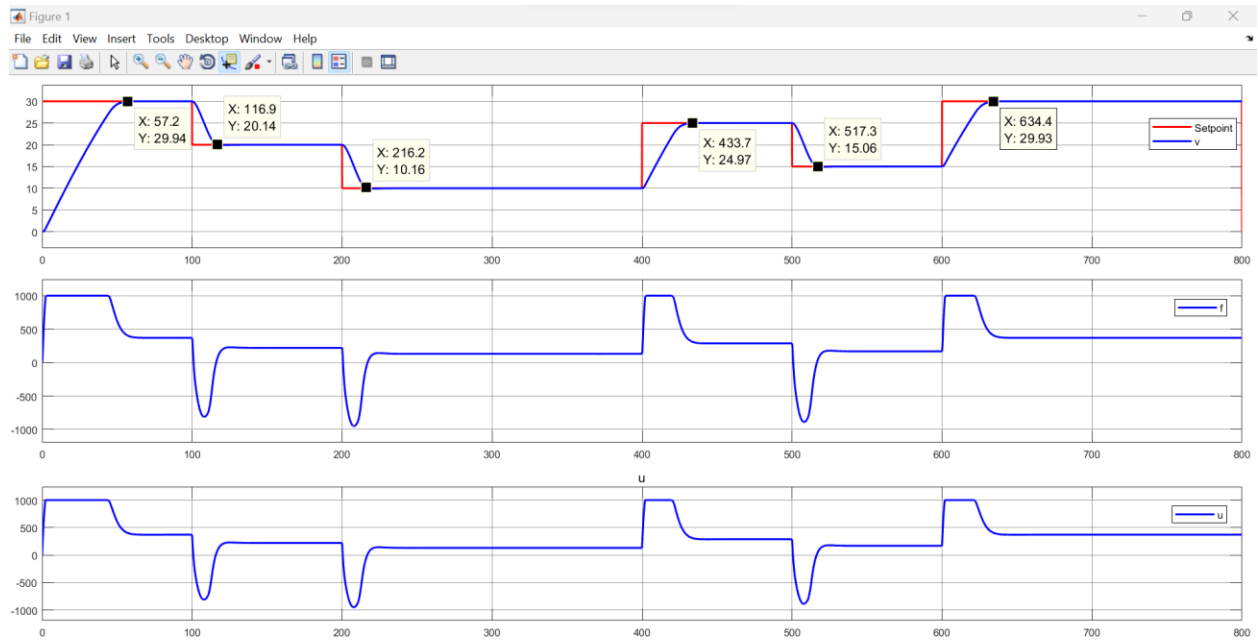
t 0.2

v0 0

f0 0

OK Cancel Help Apply

Hình 6: Thiết lập các thông số cho đối tượng



Hình 7: Đồ thị kết quả mô phỏng

### Nhận xét:

- Hệ thống điều khiển được, bám theo tín hiệu đặt. Đáp ứng của hệ thống khoảng 40s (lấy trung bình 3 khoảng) khi tăng tốc độ và khoảng 15s khi giảm tốc độ.
- Hệ thống không vọt lố.