**Grupo 3**

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## Taller 2 Ejercicio 6

### Enunciado

Implementar un sistema de control neuronal NARMA-L2 para una planta con la siguiente función de transferencia:

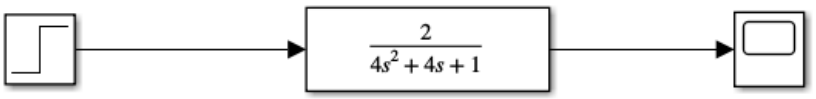
$$G(s) = \frac{2}{4s^2 + 4s + 1}$$

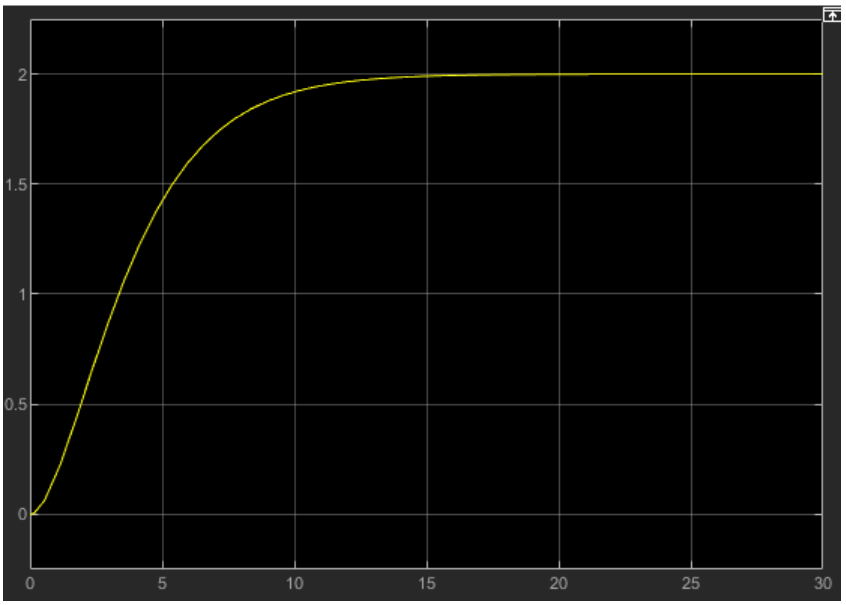
### Requerimientos de diseño

- Entrada de referencia escalón unitario μ(t).
- Oscilación en estado estable inferior al 10%.

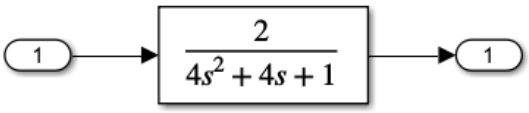
### Solución

#### Scope de la función de transferencia en simulink

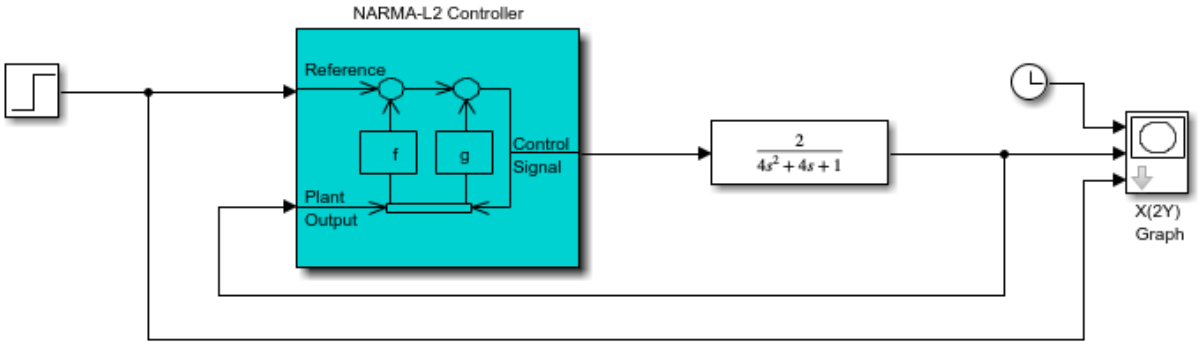


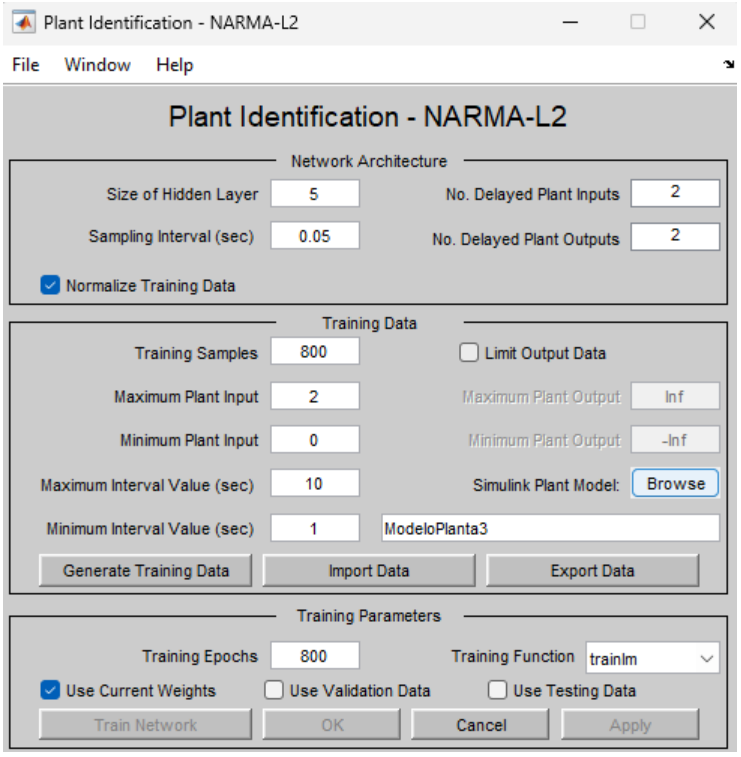
## Modelo de la planta



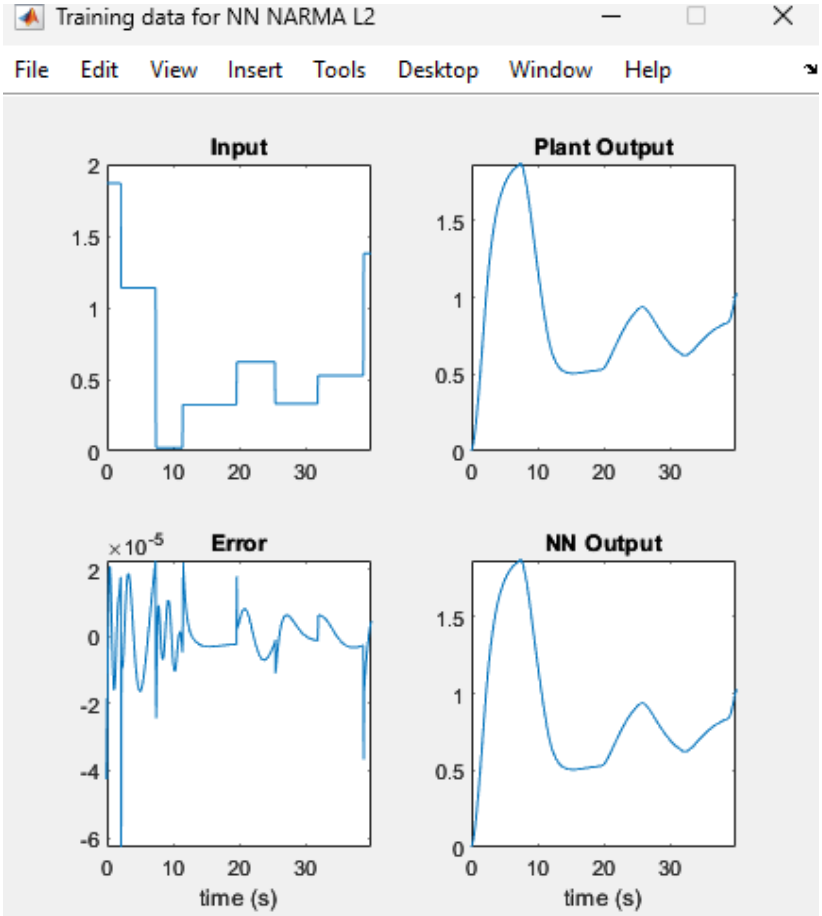

## Sistema de control neuronal NARMA-L2




## Configuración de NARMA-L2



## Entrenamiento de datos para NARMA-L2




## Entrenamiento de red neuronal

**Training Results**

Training finished: Reached maximum number of epochs

**Training Progress**

| Unit | Initial Value | Stopped Value | Target Value |
|---|---|---|---|
| Epoch | 0 | 800 | 800 |
| Elapsed Time | - | 00:00:05 | - |
| Performance | 1.42 | 6.64e-11 | 0 |
| Gradient | 4.67 | 4.62e-07 | 1e-10 |
| Mu | 0.001 | 1e-08 | 1e+10 |
| Validation Checks | 0 | 0 | 6 |

**Training Algorithms**

Data Division: Levenberg-Marquardt trainlm
Performance: Mean Squared Error mse
Calculations: MATLAB

## Salida en simulink