Laboratory 2023 #6:
water heater identification using linear and nonlinear models

Introduction to the first part (31/05/2021 videotape on Teaching Portal: 0:00 – 7:30):
Exercise – Problem setup and ARX identification
First part (with your PC and MATLAB R2014a, 30 minutes):
- Load of input-output data
- Data preprocessing (mean value removal)
- Plot of input-output data
- Definition of estimation and validation datasets
- Identification of ARX models using the estimation dataset
- Whiteness test of ARX models using the estimation dataset

Comments on the first part (videotape: 8:30 – 22:30)

Introduction to the second part (videotape: 22:30 – 24:30):
Exercise – ARX validation and performace computation, OE identification and validation
Second part (with your PC and MATLAB R2014a, 35 minutes):
- Computation of the predicted output on the validation dataset
- Computation of the RMSE and MDL criteria
- Comparison of RMSE and MDL values
- Identification of OE models using the estimation dataset
- Whiteness test of OE models using the estimation dataset
- Selection of the best trade-off between all the model classes

Comments on the second part (videotape: 24:30 – 46:00)

Laboratory 2023 #6:
water heater identification using linear and nonlinear models

Introduction to the third part (31/05/2021 Teaching Portal videotape: 46:00 – 52:30):
Exercise – NNARX identification and performace computation

Third part (with your PC and MATLAB R2014a, 45 minutes):

- Identification of NNARX models using the estimation dataset
- Computation of the predicted output on the validation dataset
- Computation of the RMSE and MDL criteria
- Comparison of RMSE and MDL values
- Selection of the best trade-off

Comments on the third part (videotape: 52:30 – 01:05:00)

For more information on nonlinear system identification with NNSYSID Matlab Toolbox, please refer to 27/05/2021 videotape on Teaching Portal: 2:06:30 – 2:20:30