The folder `continuous\_time\_inference’ corresponds to the results presented in Section III.B. First, we load the input data file (`swingEquation\_inference.mat’). Then, we randomly define the training set based on the number of Nu. After the training process, the variables U\_pred and Exact contain the predicted and actual values of the angle trajectories, respectively. The code also provides the L2 error between exact and predicted solutions for the angle (error\_u).

The folder `continuous\_time\_identification’ corresponds to the results presented in Section III.C. By running the file swingEquation\_identification.py we can predict system inertia and damping based on the input data (swingEquation\_identification.mat). The exact values of the inertia and damping levels are 0.25 and 0.15. After the training process, the code prints the estimation error for the inertia (error\_lambda\_1) and damping (error\_lambda\_2), as well as the L2 error between exact and predicted solutions for the angle (error\_u).

Code variables:

*lb* : defines the lower bound for the inputs (P,t)

*ub*: defines the upper bound for the inputs (P,t)

*Nu* : number of initial and boundary data

*Nf :* number of collocation points

*usol (δ)*: is an array containing the angle trajectories for different pair of (P,t) (output to the NN)

*x* (*P*1): is an array containing different power levels in the range [0.08, 0.18] (input to the NN)

*t* : is an array containing time instants in the range [0, 20] (input to the NN)

When publishing results based on this data/code, please cite:

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Neural Networks for Power Systems", 2019. Available online:

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