Introduction to System Identification (系统辨识)

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Overall objective

System identification is the process of creating a *model* to describe the behavior of a *dynamical system*(动力学系统), from *experimental data*.

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The input can be controlled and measured, but not the disturbance(干扰). A model is a description of the system that captures its essential behavior(基本性能).

System identification workflow



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System identification workflow



A main part of experiment design consists of selecting the input signal (duration(持续时间), sampling interval, shape(波形)).

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System identification workflow



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Split the data into an identification set and a validation set(验证集 合)(important later).

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Model structure choice



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Model structure choice



An appropriate model structure should be flexible enough to lead to an accurate model(精确的模型), but simple enough to perform the estimation task.

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Model validation



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Model validation



Validation is a crucial(关键性的) step: the model must be good enough for our purposes. If validation is unsuccessful, some or all of the previous steps must be repeated.

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Thank you.