Quantification of the statistical learning theory for dynamic system identification

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Résumé

This presentation provides statistical guarantees on the accuracy of dynamical models learned from dependent data sequences. Specifically, we develop uniform error bounds that apply to quantized models and imperfect optimization algorithms commonly used in practical contexts for system identification. Two families of bounds are obtained: slow-rate bounds via a block decomposition and fast-rate, variance-adaptive, bounds via a novel spaced-point strategy. The bounds scale with the number of bits required to encode the model and thus translate hardware constraints into interpretable statistical complexities.

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