



Model selection and parameter estimation in structural dynamics using approximate Bayesian computation

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Mots-clés	approximate Bayesian computation [5], Model selection [6], nonlinearity [7], parameter estimation [8], Sequential Monte Carlo [9]
Résumé en anglais	<p>This paper will introduce the use of the approximate Bayesian computation (ABC) algorithm for model selection and parameter estimation in structural dynamics. ABC is a likelihood-free method typically used when the likelihood function is either intractable or cannot be approached in a closed form. To circumvent the evaluation of the likelihood function, simulation from a forward model is at the core of the ABC algorithm. The algorithm offers the possibility to use different metrics and summary statistics representative of the data to carry out Bayesian inference. The efficacy of the algorithm in structural dynamics is demonstrated through three different illustrative examples of nonlinear system identification: cubic and cubic-quintic models, the Bouc-Wen model and the Duffing oscillator. The obtained results suggest that ABC is a promising alternative to deal with model selection and parameter estimation issues, specifically for systems with complex behaviours.</p>
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