ID de Contribution: **38** Type: **Non spécifié**

Novel optimization method for identifying dynamics from data using SINDY

jeudi 5 octobre 2023 13:30 (30 minutes)

Sparse Identification of Nonlinear Dynamics (SINDy) is a powerful method to discern the underlying model from data, as it utilizes modern machine learning techniques and sparse regression to discover dynamics of the system. Brunton et al. in his pioneering work proposed several optimization algorithms to solve this problem. Motivated by the nature of FitzHugh-Nagumo simplified model of the neuron, we propose a modification of the Sequentially Thresholded Least Squares (STLS) algorithm, which significantly improves the fitted model. Furthermore, we compare these methods on selected systems under various conditions. Last, but not least, we study a correspondence of FitzHugh-Nagumo and Hodgkin-Huxley models using discussed methods. The proposed optimization method is implemented in Julia and compatible with the cutting-edge DataDrivenDiffEq.jl library from the SciML ecosystem, as well as the rest of the results.

Orateur: ZAPADLO, Štěpán (Masaryk University, Brno, Czech Republic)

Classification de Session: Posters