Verification of a Neural Network for Modelling the Dynamics of a Quadcopter

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Abstract

There is growing interest in the use of neural networks for controlling dynamic systems. Model predictive control requires a model of the dynamics of the system we wish to control, and neural networks are powerful function approximators that are fast to evaluate. But by using neural networks we lose formal guarantees that are offered by more traditional approaches. Thus, being able to verify the behaviour of the neural network becomes important. We present a verification benchmark for a neural network that is trained to model the dynamics of a quadcopter for model predictive control. The aim is to verify properties that show the neural network models the dynamics accurately.

Keywords

Model predictive control, Verification