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A non-causal approach for suppressing the estimation delay of state observer

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Abstract

State estimation is essential for tracking conditions which can not be directly measured by sensors, or are too noisy. The aim of this poster is to present an approach to mitigate the phase delay without compromising the noise sensitivity, by using accessible future data. Such use of future data can be possible in cases like Iterative Learning Control, where full data of the previous trial is acquired beforehand. The effectiveness of the presented approach is verified through a motion system experiment, successfully showing the state estimation improvement in time domain. The presented non-causal approach improves the trade-offs between the phase delay of the estimation and the noise sensitivity of the state observer.

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