

学 位 論 文 の 要 旨

Disturbance observer for periodic disturbance

(周期外乱に対する外乱オブサーバ)

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The main aim of the study was to propose the parameterization of all disturbance observers for periodic disturbances and the results were separated into three sections. To begin with the first result, this research examined the parameterization of all disturbance observers for periodic output disturbances. The disturbance observers have been used to estimate the disturbance in the plant. Several papers on design methods for disturbance observers have been published. Recently, the parameterization of all disturbance observers for plants was clarified. However, no paper clarifies the parameterization of all disturbance observers for periodic output disturbances. In this content, the study proposed the parameterization of all disturbance observers for periodic output disturbances.

To continue with the second, the study examined parameterizations of all disturbance observer and all linear functional disturbance observers for periodic input disturbances. The disturbance observers have been used to estimate the disturbance in the plant. Several papers on design methods for disturbance observers have been published. Recently, the parameterization of all disturbance observers and all linear functional disturbance observers for plants with any input disturbance were clarified. However, no paper examines the parameterization of all disturbance observers and all linear functional disturbances for periodic input disturbances. In this section, the study propose parameterizations of all disturbance observers and all linear functional disturbance observers for periodic input disturbances.

The final result, the study examined the parameterization of all linear functional disturbance observers for periodic input and output disturbances. The disturbance observers have been used to estimate the disturbance in the plant. Several papers on design methods for disturbance observers have been published. Recently, the parameterization of all disturbance observers and all linear functional disturbance observers for plants with any input and output disturbance were clarified. If parameterizations of all such observers for plants with any input and output disturbance are used, there is a possibility that we could design control system to attenuate input and output disturbances effectively. However, no paper examines the parameterization of all linear functional disturbance observers for plants with any input and output disturbances. In this result, the study propose the parameterization of all linear functional disturbance observers for periodic input and output disturbances. The study presented the proposed

method could attenuate periodic disturbances effectively without using repetitive controllers. Besides, a design method and a design procedure of linear functional disturbance observer were presented. Last of all, the study explained the features of the proposed design method and they were illustrated through numerical examples.