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Abstract

The description of the error dynamics (30) in our paper [1] contains an omission that leads to some bounds used in the conditions of Theorem 8 and Corollary 2 in the paper to be incorrectly defined. In what follows, the correct error dynamics and the corresponding conditions are given.

Instead of (30) in [1], the error dynamics¹ are actually given by

\[ \dot{e} = \sum_{i=1}^{m} w_i(z)[(A_i - L_i C + M_i A_{\delta i})e + M_i (\hat{A}_{\delta i} \hat{x} + \hat{B}_{\delta i} u + \hat{\theta}_i)] + \sum_{i=1}^{m} (w_i(z) - w_i(\hat{z})) \cdot (A_i x + B_i u + M_i (A_{\delta i} x + B_{\delta i} u + \theta_i)) \]

which leads to \( \mu_{\text{max}} \) in Theorem 8 being given by \( \mu_{\text{max}} \leq \max_i \| M_i A_{\delta i} \| \), instead of \( \mu_{\text{max}} \leq \max_i \| A_{\delta i} \| \) as stated in [1].

Similarly, the correct error system (36) is given by

\[ \dot{e} = \sum_{i=1}^{m} w_i(z)[(A_i - L_i C + M_i A_{\delta i})e + M_i (\hat{A}_{\delta i} \hat{x} + \hat{B}_{\delta i} u + \hat{\theta}_i)] \]

\[ e_y = C e \]

¹In [1], the first \( M_i \) in the sum was omitted.

Preprint submitted to Elsevier
and as a consequence the last condition of Corollary 2 in [1] is

\[
\begin{pmatrix}
Q - \bar{\mu}I \\
\sqrt{2P} \\
\sqrt{2P} \\
I
\end{pmatrix} > 0
\]

where \(\bar{\mu} = \max_i \| M_i A_{\delta_i} \|^2 + \mu^2\), i.e., the sum of the squared bounds of the two vanishing disturbances. In [1] only the disturbance arising from the observer-model mismatch was considered.

Note that thanks to the \(M_i\) considered in the example of [1], with \(\| M_i \| = 1\), the change in the conditions does not affect the numerical results.

References