

Latent variable space model predictive controller for batch trajectory tracking with abnormal data

정동휘[†]

울산대학교

(jdonghwi@ulsan.ac.kr[†])

The performance of unsteady state batch trajectory control can be improved by latent variable space models such as principal component analysis (PCA) or partial least squares (PLS) and their applications to predictive controllers compared to the conventional PID control. The batch data for constructing the latent space model can have a noise and be fluctuated by a disturbance. These abnormal data deteriorate not only the predictive performance of a data-driven model but also the control performance such as the mean square errors between the target variables and reference trajectories. In order to solve this problem, a latent variable model predictive controller (LV-MPC) with additional constraints for assessing the data abnormality is proposed. Missing data imputations and conditional mean replacement are applied to make the constraints and predictions and a constrained quadratic optimization problem is solved.