Ensemble learning based latent variable model predictive control for batch trajectory tracking under concept drift

정동휘, 이종민[1,†]
고려대학교; [1]서울대학교
(jongmin@snu.ac.kr[†])

For tracking a reference trajectory varying batch-wisely, several latent variable based model predictive controllers have been proposed and applied to the batch operation systems. In a concept drift condition, however, maintaining a single model can decrease the control performance. To solve this problem, we propose to combine an ensemble learning method with the latent variable model predictive control. By using total pool of local functions and historical data set which evolves through the process and learning weights by ensemble algorithm, the effects of concept drift on the process are reflected better to the ensemble latent variable model than the conventional method. Simulation results show that both of predictive and control performances by the proposed method are better than the ones of the conventional latent variable model predictive controller.