Internal Multiple Models Control Based on Robust Clustering Algorithm

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Abstract: In this paper, Internal Multiple Model Control (IMMC) based on Robust Clustering Algorithm (RCA) is proposed. The IMMC requires, firstly, the definition of set a of local models each one valid in a given region. Different strategies exist in the literature dealing with the determination of the local models base. However, most of these strategies need a priori knowledge of the system. In order to overcome this difficulty, a RCA is proposed to find the optimum number of clusters. In the second step, the obtained data relative to each cluster will be used to build the local models base. Finally, the internal model control (IMC) structure will be developed using the models base where a linear controller will be constructed for every model. The efficiency of the IMMC based on RCA is demonstrated through an uncertain linear system and by the control of a neutralization of PH reaction in a Continuously Stirred Tank Reactor (CSTR).