

Design of a cascade controller using multi-objective optimization (MOO)

Sankararao Boddupalli, 이재형*

KAIST

(jayhlee@kaist.ac.kr*)

Three multi-objective control (MOC) problems have been formulated for the efficient design of a PI/P controller for a series cascade system, and solved using elitist Non-dominated Sorting Genetic Algorithm (NSGA-II). The proposed method minimizes two objectives simultaneously from the several available objectives, such as minimization of overshoot, minimization of rise time, minimization of ITAE and minimization of IAE. The present method generates multiple sets of controller parameters. The designer thus has a choice to pick up the best controller settings (which will give the best closed loop performance) from these multiple sets based on his choice of design specifications. The results obtained using the proposed method outperformed the results obtained using currently existing controller design methods in the literature, hence, can be considered as one of the best approach for designing cascade controllers.