

Abstract

Dynamic safety margin principle and application in control of safety critical systems

Control systems are designed in general to meet a given performance requirement. Dynamic safety margin (DSM) is a new performance index used to measure the distance between a predefined safety boundary in the state space and the system trajectory as it evolves. Controller design based on DSM is especially important for safety-critical systems to maintain a predefined margin of safety during the transient and in the presence of large disturbances. In this paper, the idea of DSM is explained and applied in controller design for fluid level in two-tank system. Simulation examples and results of a real-time implementation on the actual process demonstrate the fruitfulness of this design