DETERMINING THE WEIGHTS OF SCHEDULING AND RESPONDING IN THE CONTROL OF A DYNAMIC SYSTEM

JOACHIM MEYER *and* YUVAL BITAN

Ben Gurion University of the Negev, Beer Sheva, Israel

Abstract

Operators of complex systems combine actions they schedule and initiate, and actions they perform as responses to events (such as alarms). Previous studies showed qualitative changes in the effect of scheduling and responding, but no quantitative measures of the relative weight of scheduled and respondent actions were available. The paper suggests the use of standardized weights from logistic regression analyses as a possible measure. The measure was computed for responses of individual users in a study in which participants had to monitor three stations that required different rates of interventions. The experimental conditions differed in the reliability of a warning system that indicated a possible malfunction in a station and in the system's predictability. Logistic regressions were run to predict operator actions as a function of the time since the last action and of the information from the warning system. The weights were found to be sensitive to the diagnostic value of the warning indicator and the predictability of the system.