

Dear Editor,

We would like to submit the enclosed manuscript entitled "R-step Relative Copredictability of Decentralized Failure Prognosis in Discrete-Event Systems", which we wish to be considered for publication in Journal of Control Engineering and Applied Informatics.

The work described has not been submitted elsewhere for publication, in whole or in part, and all the authors listed have approved the manuscript that is enclosed. We believe that two aspects of this manuscript will make it interesting to general readers of your journal.

First, the notion of r -step relative copredictability of DESs is introduced under the decentralized framework to describe the property that the occurrence of at least a failure event can be predicted prior to r steps at most based on at least one local observation.

Second, the concept of predictive vector is introduced to accurately describe the relative copredictability of a DES. Through the value of the predictive vector, we can clearly know which failure branches in the system are copredictable.

Third, the necessary and sufficient condition for verifying the relative copredictability is presented and a polynomial-time algorithm is developed for accurately computing the predictive vector and the boundary number of steps prior to the occurrences of failure events. Moreover, the algorithm is also used to deal with the problem of copredictability introduced by Liu.

Thank you very much for your time and consideration.

Sincerely yours,

RuiZhao, FuchunLiu