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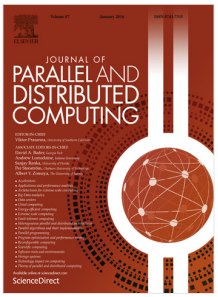

A proactive approach based on online reliability prediction for adaptation of service-oriented systems

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Highlights

（1）This paper identifies the critical problem of predicting the online reliability time series for a service-oriented SoS under the dynamic and uncertain running environment;

（2）We first integrate Dynamic Bayesian Networks (or DBNs) with time series motifs and propose a motifs-based DBNs, or m DBNs model to accomplish one-step-ahead time series reliability prediction;

（3）To further improve the prediction accuracy, a multi-steps trajectories DBNs, (or multi DBNs) is proposed based on the cumulative effects of previous predicted time series;

（4）We present an proactive adaption strategy based on the prediction results and other QoS constraints for significant SoS components;

（5）We conduct extensive experiments over real world Web services to verify the effectiveness of the proposed approach.