

An automated software reliability prediction system for safety critical software

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Software reliability is one of the most important software quality indicators. It is concerned with the probability that the software can execute without any unintended behavior in a given environment. In previous research we developed the Reliability Prediction System (RePS) methodology to predict the reliability of safety critical software such as those used in the nuclear industry. A RePS methodology relates the software engineering measures to software reliability using various models, and it was found that RePS's using Extended Finite State Machine (EFSM) models and fault data collected through various software engineering measures possess the most satisfying prediction capability. In this research the EFSM-based RePS methodology is improved and implemented into a tool called Automated Reliability Prediction System (ARPS). The features of the ARPS tool are introduced with a simple case study. An experiment using human subjects was also conducted to evaluate the usability of the tool, and the results demonstrate that the ARPS tool can indeed help the analyst apply the EFSM-based RePS methodology with less number of errors and lower error criticality.

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