Abstract

Software reliability engineering has gained considerable momentum in the recent past. A variety of models are available for the evaluation of software reliability. However the models, as such, cannot be applied for software based systems as any given system is comprised of both hardware and software. The present paper brings up an algorithm for determining reliability of software based systems by integrating both hardware reliability and software reliability. The open source software data is made use of and the methodology for evaluating the software reliability involves identifying a fixed number of packages at the start of the time and defining the
failure rate based on the failure data for these preset number of packages. The defined function of
the failure rate is used to arrive at the software reliability model. The hardware reliability is
obtained using constant hazard model.

Reference

- Kumar D, Klefsjo B, Kumar U. Reliability analysis of power-transmission cables of electric
- Goel HD, Grievink J, Herder PM, Weijnen MPC. Integrating reliability optimization into
- Charles EE. Reliability and maintainability engineering.1st ed. New Delhi: Tata
- Weiguo Li,Yongfu Wang, He Huang A new model for software reliability Fifth
international Joint Conference on INC, IMS and IDC, 2009 IEEE.
- Michael R Lyu Software Reliability Engineering: A Roadmap, Future of Software
engineering (FOSE 07) May 2007 IEEE.
- J.D. Musa and A. Iannino. Software reliability modelling-accounting for program size
variation due to integration or design changes. Proceedings of the 1981 ACM
- Ying ZHOU,Joseph Davis. Open Source Software reliability model: an empirical
approach, ACM 2005.
Growth of Open Source and In-House Software. 2008 IEEE 15th Asia-Pacific Software
Engineering Conference
- Obra Rahmani,Harvey Siy, Azad Azadmanesh. An Experimental Analysis of Open
Source Software Reliability. Department of Defense/Air Force Office of Scientific Research
- Lars M.Karg, Michael Grottke, Arne Beckhausa. Conformance Quality and Failure Costs
in the Software Industry: An Empirical Analysis of Open Source Software. 2009 IEEE.
- Kan H.S. Metrics and models in software quality engineering, 2nd edition,
Addison-Wesley(2003).
Proceedings annual reliability and maintainability symposium.
- J D Musa and K. Okumoto. A logarithmic Poisson execution time model for software
reliability measurement 7th international conference on Software Engineering(ICSE),1984, pp.
230-238.
- Z. Jelinski and P.B. Moranda, Software Reliability research, in Stastistical Computer
- B. Littlewood and J.L. Verrall, A Bayesian reliability growth model for computer software,
A Model for Reliability Estimation of Software based Systems by Integrating Hardware and Software

- http://www.debian.org

**Index Terms**

Computer Science  
Software Engineering

**Key words**

Failure rate

hardware  
reliability

software