MAFSE: A model-based framework for software verification

Faculty of Computer Science and Engineering, Hochiminh City University of Technology, Hochiminh, Viet Nam

Abstract: Model checking techniques have been applied widely for verifying hardware designs and protocols since they can check if the system operates as desired or not without actually running the system. Recently, the usage of model checking for software verification has also been increasingly considered. One notable advantage of the model checking approach is the ability of producing counter-example when detecting undesired problem. However, model checking also suffered some prominent disadvantages which are (i) state explosion problem with non-trivial input space and (ii) over-specific model-based representation of verification results. In this paper, we propose a framework known as MAFSE (Model-bAsed Framework for Software vErification) which is still able to make full use of model checking capability for verifying software programs yet overcoming those typical drawbacks by applying appropriate methods. Our framework has been tested with some lab-scaled data and is promising to be applied for industrial software engineering. © 2010 IEEE.

Author Keywords: Automatic program verification; Counter example generation; Guided random input generation; Model checking

Index Keywords: Automatic programs; Counter example generation; Hardware design; Input space; Model-based; Model-checking techniques; Non-trivial; Random input; Software program; Software verification; State explosion problems; Verification results; Automatic programming; Computer software selection and evaluation; Software engineering; Software reliability; Model checking

Year: 2010
Source title: SSIRI-C 2010 - 4th IEEE International Conference on Secure Software Integration and Reliability Improvement Companion
Art. No.: 5521574
Page : 150-156
Link: Scopus Link

Correspondence Address: Quan, T. T.; Faculty of Computer Science and Engineering, Hochiminh City University of Technology, Hochiminh, Viet Nam; email: qttho@cse.hcmut.edu.vn

Sponsors: National University of Singapore (NUS);Infocomm Development Authority of Singapore;Reliability Society

Conference name: 4th IEEE International Conference on Secure Software Integration and Reliability Improvement Companion, SSIRI-C 2010
Conference date: 9 June 2010 through 11 June 2010
Conference location: Singapore
Conference code: 81517
DOI: 10.1109/SSIRI-C.2010.36
Language of Original Document: English
Abbreviated Source Title: SSIRI-C 2010 - 4th IEEE International Conference on Secure Software Integration and Reliability Improvement Companion
Document Type: Conference Paper
Source: Scopus
Authors with affiliations:
1. Quan, T.T., Faculty of Computer Science and Engineering, Hochiminh City University of Technology, Hochiminh, Viet Nam
2. Hoang, D.L.N., Faculty of Computer Science and Engineering, Hochiminh City University of Technology, Hochiminh, Viet Nam
3. Nguyen, B.T., Faculty of Computer Science and Engineering, Hochiminh City University of Technology, Hochiminh, Viet Nam
4. Nguyen, A.N., Faculty of Computer Science and Engineering, Hochiminh City University of Technology, Hochiminh, Viet Nam
5. Tran, Q.D., Faculty of Computer Science and Engineering, Hochiminh City University of Technology, Hochiminh, Viet Nam
6. Nguyen, P.H., Faculty of Computer Science and Engineering, Hochiminh City University of Technology, Hochiminh, Viet Nam
7. Thang, H.B., Faculty of Computer Science and Engineering, Hochiminh City University of Technology, Hochiminh, Viet Nam
8. Do, A.T., Faculty of Computer Science and Engineering, Hochiminh City University of Technology, Hochiminh, Viet Nam
9. Huynh, L.V., Faculty of Computer Science and Engineering, Hochiminh City University of Technology, Hochiminh, Viet Nam
10. Doan, N.T., Faculty of Computer Science and Engineering, Hochiminh City University of Technology, Hochiminh, Viet Nam
11. Huynh, N.T., Faculty of Computer Science and Engineering, Hochiminh City University of Technology, Hochiminh, Viet Nam
12. Nguyen, T.D., Faculty of Computer Science and Engineering, Hochiminh City University of Technology, Hochiminh, Viet Nam
13. Nguyen, T.T., Faculty of Computer Science and Engineering, Hochiminh City University of Technology, Hochiminh, Viet Nam
14. Nguyen, V.H., Faculty of Computer Science and Engineering, Hochiminh City University of Technology, Hochiminh, Viet Nam

References: