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### **Abstract**

UML diagrams present the graphical representation of the system. Model-driven testing not only helps in early identification of faults but also results in reducing the testing effort at the later stages of SDLC. This paper intends to identify and make a critical review of different techniques for test case generation using UML activity diagrams (UAD). System activity diagram is used to depict the different dynamic aspects of the system. UAD not only presents the sequential or concurrent activities but also presents the conditional and parallel activities. For this literature survey different aspects like test case generation, test automation, and test case prioritization & minimization using UAD has been explored. The analysis of the literature portrays that extensive literature exists regarding automation of the testing using various aspects of activity diagrams. Similarly, test cases prioritization has also been explored using the activity diagrams incorporating manual, automated and semi-automated techniques.

### **References**

1. Kumar, R., & Bhatia, R. K. (2012). Interaction Diagram Based Test Case Generation. In *Global Trends in Information Systems and Software Applications* (pp. 202-211). Springer Berlin Heidelberg.
2. Linzhang, W., Jiesong, Y., Xiaofeng, Y., Jun, H., Xuandong, L., & Guoliang, Z. (2004, November). Generating test cases from UML activity diagram based on gray-box method. In *Software Engineering Conference, 2004. 11th Asia-Pacific* (pp. 284-291). IEEE.
3. Ms. Hetal J. Thanki, Prof. S.M.Shinde. "Test Case Generation and Minimization using UML Activity Diagram in Model Driven Environment", *International Journal of Computer & organization Trends (IJCOT)*, V9 (1):41-44 June 2014.
4. C. Mingsong, Q. Xiaokang, and L. Xuandong, "Automatic Test Case Generation for UML Activity Diagrams", In *Proc. of the International Workshop on Automation of software test*, pp. 2-8, 2006.
5. Chen, M., Qiu, X., Xu, W., Wang, L., Zhao, J., & Li, X. (2009). UML activity diagram-based automatic test case generation for Java programs. *The Computer Journal*, 52(5), 545-556.
6. Pechtanun, K., & Kansomkeat, S. (2012, June). Generation test case from UML activity diagram based on AC grammar. In *Computer & Information Science (ICCIS), 2012 International Conference on* (Vol. 2, pp. 895-899). IEEE.
7. Patel, P. E., & Patil, N. N. (2013, April). Testcases Formation using UML Activity Diagram. In *Communication Systems and Network Technologies (CSNT), 2013 International Conference on* (pp. 884-889). IEEE.
8. Verma, V., & Arora, V. (2014, May). A novel approach for automatic test sequence generation for java fork/join from activity diagram. In *Advanced Communication Control and Computing Technologies (ICACCCT), 2014 International Conference on* (pp. 1611-1615). IEEE.
9. Sangeeta Sabharwal, Ritu Sibal and Chayanika Sharma, "Applying Genetic Algorithm for Prioritization of Test Case Scenarios Derived from UML Diagrams", *IJCSI International Journal of Computer Science Issues*, Vol. 8, Issue 3, No. 2, May 2011.
10. Sapna, P. G., & Mohanty, H. (2008, December). Automated Scenario Generation Based on UML Activity Diagrams. In *Information Technology, 2008. ICIT'08. International Conference on* (pp. 209-214). IEEE.
11. Sun, C. A., Zhang, B., & Li, J. (2009, August). TSGen: A UML Activity Diagram-Based Test Scenario Generation Tool. In *Computational Science and Engineering, 2009. CSE'09. International Conference on* (Vol. 2, pp. 853-858). IEEE.
12. Swain, R. K., Panthi, V., Mohapatra, D. P., & Behera, P. K. (2014). Prioritizing test scenarios from UML communication and activity diagrams. *Innovations in Systems and Software Engineering*, 10(3), 165-180.
13. Biswal, B. N., Nanda, P., & Mohapatra, D. P. (2010). A Novel Approach for Optimized Test Case Generation Using Activity and Collaboration Diagram. *International Journal of Computer Applications*, 1(14), 67-71.
14. Jena, A. K., Swain, S. K., & Mohapatra, D. P. (2014, February). A novel approach for test case generation from UML activity diagram. In *Issues and Challenges in Intelligent Computing Techniques (ICICT), 2014 International Conference on* (pp. 621-629). IEEE.
15. Sapna, P. G., & Mohanty, H. (2009, July). Prioritization of scenarios based on UML Activity Diagrams. In *Computational Intelligence, Communication Systems and Networks, 2009.*

CICSYN'09. First International Conference on (pp. 271-276). IEEE.

16. Ye, N., Chen, X., Ding, W., Jiang, P., Bu, L., & Li, X. (2012, July). Regression Test Cases Generation Based on Automatic Model Revision. In Theoretical Aspects of Software Engineering (TASE), 2012 Sixth International Symposium on (pp. 127-134). IEEE.

17. Fernandez-Sanz, L., & Misra, S. (2012). Practical Application of UML Activity Diagrams for the Generation of Test Cases. Proceedings of the Romanian Academy, Series A, 13(3), 251-260.

18. Khurana, R., & Saha, A. (2012). Empirical Comparison of Test Data Generation Techniques using Activity Diagrams. International Journal of Computer Applications, 51(7), 13-19.

19. Kansomkeat, S., Thiket, P., & Offutt, J. (2010, October). Generating test cases from UML activity diagrams using the Condition-Classification Tree Method. In Software Technology and Engineering (ICSTE), 2010 2nd International Conference on (Vol. 1, pp. V1-62). IEEE.

20. Hyungchoul Kim, Sungwon Kang, Jongmoon Baik, Inyoung Ko , "Test Cases Generation from UML Activity Diagrams", Eighth ACIS International Conference on Software Engineering, Artificial Intelligence, Networking, and Parallel/Distributed Computing, 2007. SNPD 2007, VOL 3 pp. 556-561.

21. Xin Fan, Jian Shu, LinLan Liu, QiJun Liang, "Test Case Generation from UML Sub-activity and Activity Diagram", 2009 Second International Symposium on Electronic Commerce and Security(ISECS '09) , VOL 2, pp. 244-288.

22. Supaporn Kansomkeat, Phachayanee Thiket Jeff Offutt, "Generating Test Cases from UML Activity Diagrams using the Condition-Classification Tree Method", 2010 2nd International Conference on Software Technology and Engineering(ICSTE), pp. V1-62 – V1-66.

23. Pakinam N. Boghdady, Nagwa L. Badr, Mohamed A. Hashim, Mohamed F. Tolba , 'An Enhanced Test Case Generation Technique Based on Activity Diagrams", 2011 International Conference on Computer Engineering & Systems (ICCES), pp. 289-294.

### Index Terms

Computer Science

Software Engineering

### Keywords

Test Case Generation, UML Activity Diagram, Software Testing, Test Cases, Test Automation