Automated Replay and Failure Detection for Web Applications

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Summary:

- This paper designed, implemented and evaluated set of automated replay technique and oracle comparators for user-session based testing of web applications.
- This paper describes evaluation and design of four oracle comparators used in combination with replay with or without state information considered.
- In User-session based testing, User session is a collection of user request in the form of URL and name value pair, A test case consist of HTTP request that are associated with each user session.
- User session collection, testing web application and evaluating effectiveness of test suits is done by integrated framework for automated testing of web based applications developed by the authors an integrated framework for automated testing web based application.
- This paper investigates the role of persistent state n web based applications behavior during user session replay
- Several approaches for replaying test suites and for comparing expected with actual outputs
- Results conclude that A combination of the oracle comparator and the replay technique can be used to detect faults in different areas of code.

Positive:

- Comparison of four comparators namely RAW, CONTENT to remove false positives by ignoring HTML tags, STRUCTURE and FLINT that catches error that causes difference in page level control flow.
- They measured effects of Replay on program coverage.
- They measured effect of replay and oracle on failure detection to evaluate accurately they measured false positive which is when the oracle reports a fault based on output differences, but, on manual inspection, the seeded fault did not cause the difference in the output, which concludes that RAW is most likely to report false positives followed by content and structure
- They also measure relative cost of techniques which is Flist and raw turns out to cheapest operators and content structure required the most computing

Negative:

- This paper focus on issues in executing test cases serially, There should be a plan to address the challenges that parallel replay poses.
- They conducted their experiment only on two applications, this work can not be generalized
- Applications are not complex enough to show large difference in program coverage and fault detection when comparing oracle and relpay techniques.
- The seeded faults were more difficult to expose that naturally occurring faults.