ABSTRACT

Dissertation contains 79 pages, 2 applications, 29 figures, 4 tables and 26 references.

Topic Relevance. Software testing is an integral part of the software developing. Automated testing, in fact, becomes more and more necessary and popular in testing process. Development of the multithreaded testing web applications provide possibility run automated scripts in multiple threads, which helps to reduce the time required for testing web applications.

Especially important is the implementation of the system under development. This makes it possible to avoid future additional money.

For customer's team is very important to see how the process of testing is going. Multithreaded testing system enables generation of HTML and XML reports that show test results and defects, which are present in the software.

Thesis connection to scientific programs, plans, and topics. The thesis was carried out according to the plan of research department of Applied Mathematics National Technical University of Ukraine "Kyiv Polytechnic Institute".

Research goal and objectives. The purpose of the study is to develop a system of multithreaded testing in order to reduce the time execution of testing. The system should provide the ability to run tests in multiple streams, the ability to restart tests that did not pass, generating HTML- and XML-reporting, ability to filter tests.

To achieve the above stated goal was solved the following problems:

- Analyze the problem of parallel testing web applications;
- Analyze existing solutions and establish the main drawbacks of existing systems;
- Have ability to run tests in multiple threads;
- Have the possibility of filter tests;
- Have the possibility of rerun tests that have not worked;
- Fix time execution for each test;
- Generate of HTML and XML reports;

- Check the adequacy of the results.

Object of research are the types and grades of software, methods, testing strategies, models of evaluation the quality of testing, parallel testing methods, parallel testing processes, algorithm of searching tests.

Subject of research is a multithreaded testing system with possibilities to rerun failed tests, the possibility to filtering tests and generating reports.

Results of research is multithreaded testing system with the capabilities to restart failed tests, generating HTML- and XML- reports with powerful tool of filtering categories, fixing the time execution for each test in xls format.

Methods of research. To solve this flaw, was used model of a graph algorithm "operations-operands" and to assess the maximum theoretical gain in performance parallel solution were used Amdahl's Law and Gustafson-Barsysa.

Scientific contribution includes the following provisions:

- was improved multithreaded testing web application systems that differs from existing systems to have an opportunity to restart failed tests, ease of setup and have possibility to generate HTML- and XML- reports.

- was improved search algorithm test in library with tests. The algorithm has been improved by adding additional filtering and reflection in search of tests.

- for the first time was added to the system of multithreaded testing web applications ability to filter tests, providing the ability to run any automated tests that are available in the library.

Practical value of obtained results. The system can reduce the time required for testing Web applications and receive reports on the results of testing 2-4 times depending on the number and power flow testing machine.

The use of multypotochnoho testing can significantly reduce future additional investment in doobratsyuvannya Web applications by finding errors early in the development of web applications.

Approbation of the thesis results. The main provisions and the work presented at the VIII scientific conference of graduate and post-graduate "Applied mathematics and

computing 'and MVP-2016 XVII International Scientific Conference SAIT 2016. The developed system is used on a real project in the company EPAM SYSTEMS.

Publications. The results of the thesis presented in two scientific papers, including:

– VIII scientific conference of masters and PhD students "Applied mathematics and computing - PMC-2016." Abstracts "System for testing multithreaded Web applications based on algorithms of parallel calculations";

– XVII International Scientific Conference SAIT 2016 "System for testing multithreaded Web applications based on algorithms of parallel calculations".

Keywords: Parallel testing, multithreaded, automated testing, software, defect, thread, tests filtration, graph algorithm "operations-operands".