

A Solution Recommender for Exceptions in an Integrated Development Environment

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ABSTRACT

Exceptions are an indispensable part of a software development process. Developers usually rely on imprecise results from a web search to resolve the exceptions. More specifically, they manually design a query based on the information indicated by the exception message and the stack trace of that exception. Afterwards, they choose and adapt a solution from the web search results. In this scenario, there is a gap between the development environment and web browsers. Moreover, manual search is very time consuming and a lot of useful information from the code is lost. In this paper, we introduce Exception Tracer, an Eclipse plug in that helps developers find solutions of exceptions. Exception Tracer uses the information from the stack trace and the code context where that exception has happened to find relevant code snippets from the Source Forge projects. It then ranks retrieved code snippets from Source Forge projects with the help of GROUM graphs. Finally, variable names are replaced with appropriate names from the developer's code and candidate solutions are shown to him. In addition to candidate code snippets from the Source Forge projects, Exception Tracer retrieves relevant discussions from Stack Overflow. The performance of the proposed approach was measured on a number of code samples from Apache and Java projects and it was shown that for %75 of exceptions, the correct solution is in the 5 topmost results of Exception Tracer. An empirical study with 14 subjects also indicated that Exception Tracer can increase the performance of developers an average of %38 compared to manual web search.

Keywords: Integrated Development Environment, Recommender Systems, Code Snippets, Stack Overflow, Exception Faults, Eclipse Plugin.