Improved Bug Localization using Keyword-Source Co-occurrence

*Note: Sub-titles are not captured in Xplore and should not be used

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***Abstract*—Bug localization is one of the most challenging tasks undertaken by the developers during software maintenance. Existing studies mostly rely on lexical similarity between the bug reports and source code for bug localization. However, such similarity always does not exist, and these studies suffer from vocabulary mismatch issues. In this paper, we propose a bug localization technique that (1) not only uses lexical similarity between bug report and source code documents but also (2) exploits the co-occurrences between keywords from the past reports and source tokens from corresponding changed code. Experiments using a collection of 6000 bug reports show that our technique performs significantly higher in terms of Hit@K and MAP than one state-of-the-art IR-based bug localization techniques using TF-IDF and other LDA based technique.**

***Index Terms*—bug report, bug localization, source files.**

I. Introduction

Bug localization is the process of locating the source codes that need to be changed in order to fix a given bug. Locating buggy files is time-consuming and costly if it is done by manual effort, especially for the large software system when the number of bug of that system becomes large. Therefore, effecting methods for locating bugs automatically from bug reports are highly desirable. In automatic bug localization technique, it takes a subject system as an input and produces a list of entities such as classes, methods etc. against a search query. For example, information retrieval based techniques rank the list of entities by predicted relevance and return a ranked list of entities or source codes which may contain the bug. The bug localization techniques are also affected by the fact of designing effective query. If a query contains inadequate information, then the retrieval results will not be relevant at all. One other thing that the performance of existing bug localization approach did not reach to an accepted level and so far those studies showed good results for a small set of bugs. Therefore, in this paper, we apply a bug localization technique on large dataset that exploits an association link established from bug report repository to source code base through commit logs.

Identify applicable funding agency here. If none, delete this.

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$$a + b = \gamma \tag{1}$$

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- There is no period after the "et" in the Latin abbreviation "et al.".
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TABLE I
TABLE TYPE STYLES

Table Head	**Table Column Head**		
	Table column subhead	***Subhead***	***Subhead***
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ACKNOWLEDGMENT

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