RESEARCH STATEMENT

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Research Interest

Software Systems and Data Mining

Software debugging is a challenging and expensive activity. The location of bugs could be far away from the failure point; manually locating the bug could be difficult. Furthermore, it is also reported that testing and debugging contribute 30 to 90 percent of the labor expended for a project (Beizer, 1990). Hence, automating the debugging process is important to lower down the cost of software debugging.

There are many techniques have been proposed to automate the debugging processes. In finding the location of bugs, some techniques could locate bugs accurately, but they often require expensive time and domain specific of certain bugs. The other techniques could locate bugs in much shorter time and applicable for more bugs, but as a tradeoff they only have a good enough accuracy. It is my interest to contribute in fault localization techniques so that the technique could report to developer the location of bugs with good accuracy and using inexpensive time.

This problem could be related to bug identification, where we could locate bug more accurate if we could identify the bug characteristics. However, identifying bug characteristics is a challenging task since the patterns of bugs are hard to identify. In data mining and information retrieval domain, many techniques could be potentially incorporated and extended to solve software engineering problem domain. Utilizing these domains into software engineering domain is also my main research interest.

Current Research

Fault Localization

By having certain information about failures occur in a program, the problem is to report where the location of bug in the program (bug localization) to the user accurately and inexpensive. We could make use of spectrum based fault localization using association measures that has been proposed in data mining and statistic domain to find the most suspicious program element that likely to contain bug. This technique has inexpensive time as its advantage, furthermore improvement on the accuracy of the technique is a challenging problem.

Bug Identification

Given a program, we may want to identify whether a bug could reside in this program. It is also an interest whether the program might contain violation of certain software architecture rule.