

Mea culpa: How developers fix their own simple bugs differently from those of other developers

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06 May 2021

Bug fixing in Open Source Software (OSS)

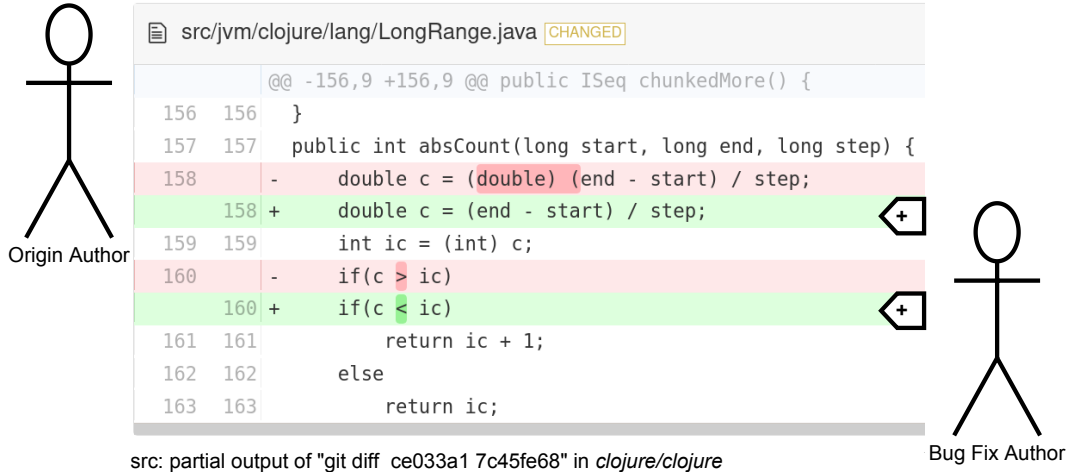


Figure 1: Example git diff

Dataset collection

- 10,231 SStuBs from the top 100 Maven projects by popularity

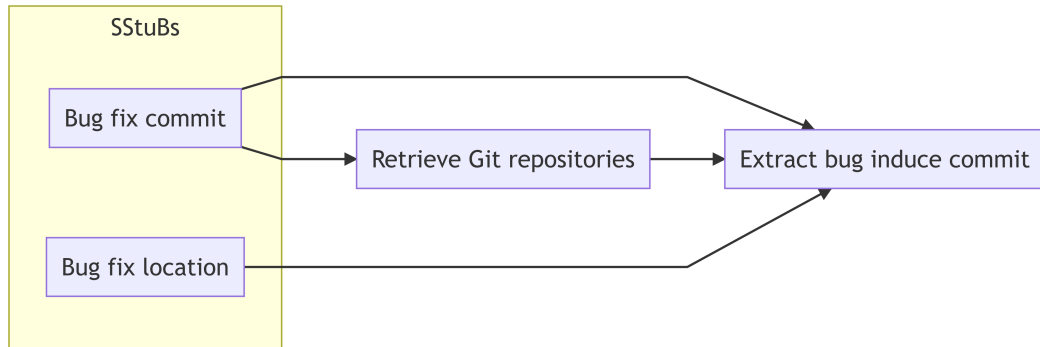


Figure 2: Extracting bug induce commit

Adapting the SZZ algorithm to git

Integration (e.g., C6) vs Implementation (e.g., C4)

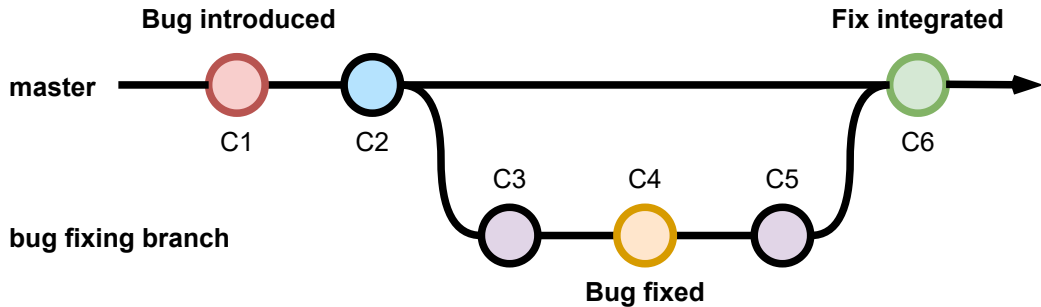


Figure 3: Example git tree

Determine commit attributes

Authorship

The author information stored in a *Git* commit

Bug fixing time

Time difference between bug induce and bug fix

Commit size (i.e., Churn)

Sum of added and removed lines

Developers fix their own simple bugs about half of the time

Table 1: Bug fixes by authorship

Fixed by same author	Fixed by a different author	Total
5,674	4,508	10,182

Bug fixes by same author is fast and often within the same day

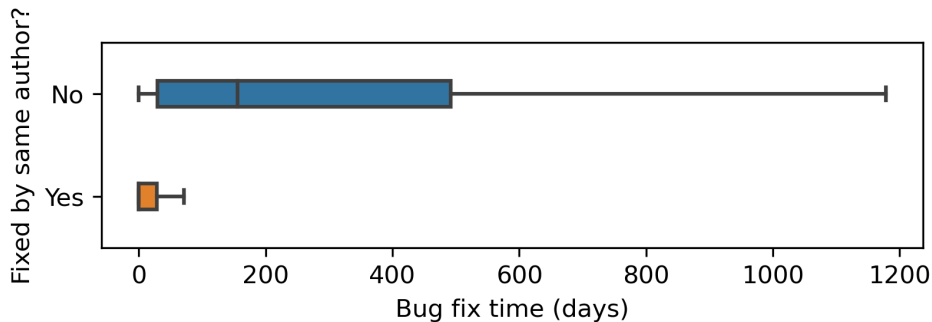


Figure 4: Distribution of bug fix time by authorship

Bug fixes by same author is larger in size and varies widely

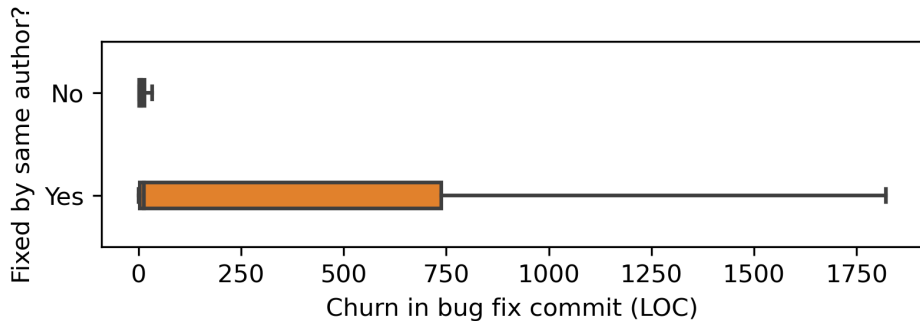


Figure 5: Distribution of bug fix size by authorship

Patterns of fixing simple statement bugs

Fixed by same developer:

- Fixed soon after bug introduced
- Fix often embedded inside larger commit that “does more”

Fixed by different developer:

- Fix often occurs after a significant delay
- Fix is short, basically just fixes the bug and nothing more

Summary

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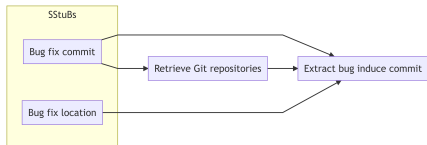


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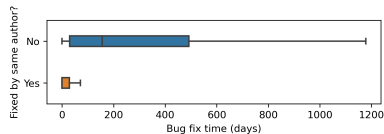


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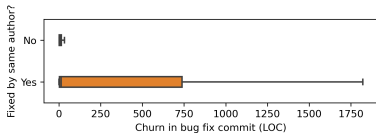


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