

**1. Title of the paper that this artifact is associated with:**

*Extracting Concise Bug-Fixing Patches from Human-Written Patches in Version Control Systems*, ICSE 2021, technical track.

**2. Paper ID (Technical Track):**

1450

**3. Purpose of the approach (artifact):**

The implementation of the proposed approach is called **BugBuilder**. The only functionality of the tool is to extract concise and complete bug-fixing patches from Github.

High-quality and large-scale repositories of real bugs and their concise patches collected from real-world applications are critical for research in software engineering community. A number of such repositories, e.g., Defects4J, have been proposed. However, such repositories are rather small because their construction involves expensive human intervention. In this paper, we propose an automatic approach, called BugBuilder, to extract complete and concise bug-fixing patches from human-written patches in version control systems. It excludes refactorings by detected refactorings involved in bug-fixing commits, and reapplying detected refactorings on the faulty version. It enumerates all subsets of the remaining part and validates them on test cases. If none of the subsets has the potential to be a complete patch, the remaining part as a whole is taken as a complete and concise patch. Evaluation results on 809 real bug-fixing commits in Defects4J suggest that BugBuilder successfully generated complete and concise patches for forty percent of the bug-fixing commits.

**4. The badge(s) we are claiming:**

Reusable or Available

**5. Technology skills assumed by the reviewer evaluating the artifact:**

No

**6. Public availability:**

BugBuilder is publicly available at <https://github.com/jiangyanjie/BugBuilder>