

Evaluation of Cross-Lingual Bug Localization: Two Industrial Cases



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HITACHI
Inspire the Next

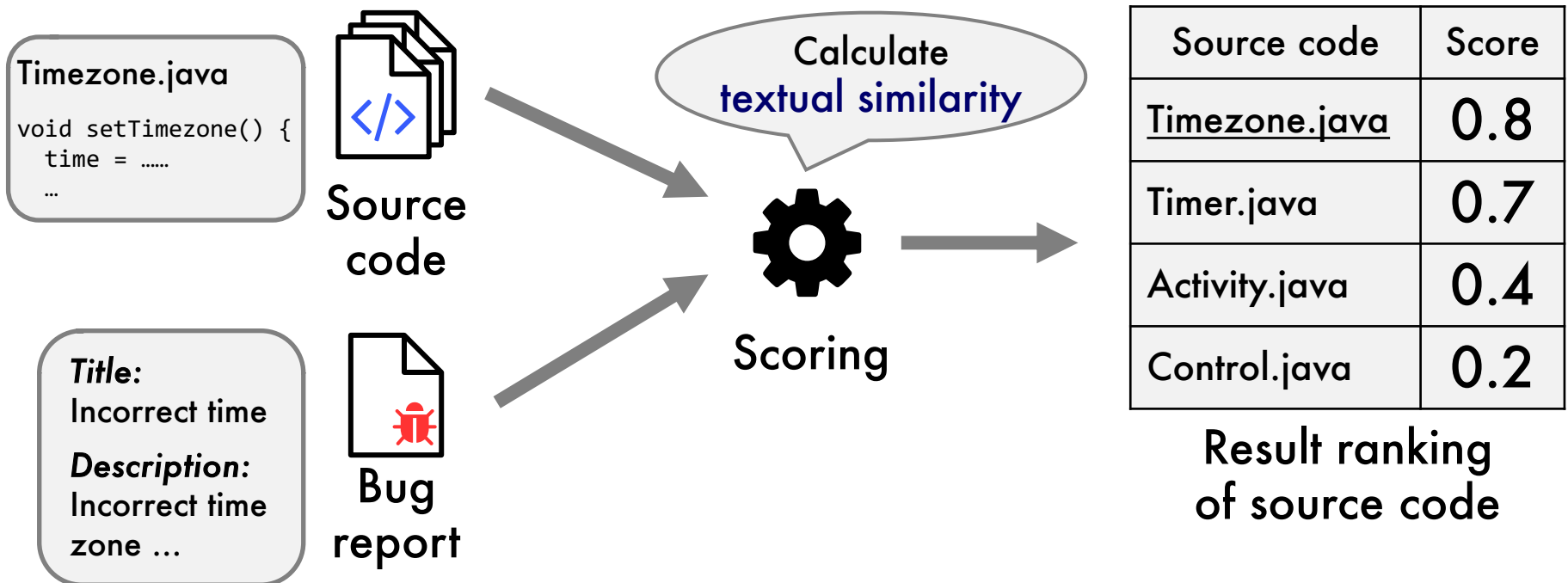
Hitachi, Ltd., Japan



Bug Localization

IR-Based Bug Localization (IRBL)

- The process of identifying the location(s) of a given bug using an IR-based technique



<> Code Issues 270  Pull requests 23  Actions  Projects  Wiki  Security  Insights

 is:issue is:open

 Labels 54

 Milestones 1

New issue

 270 Open  800 Closed

Author ▾

Label ▾

Projects ▾

Milestones ▾

Assignee ▾

Sort ▾

 **didChange request fails.**

 1

#2199 opened 3 days ago by balabesimple1

 **JDTLS Doesn't Work Properly On Neovim After Creating New Buffers**

 1

#2196 opened 6 days ago by anthony-S93

 **Keep running into module errors when launching lsp server with java 16.0.1**

#2193 opened 11 days ago by lilmert

 **[improvement] Use existing workspace indexes while updating the projects**

 2

#2192 opened 11 days ago by gayanper

 **jdtls: set up `-data` directory**

#2191 opened 11 days ago by manuel-uberti

 **folders with known extension type part of their name are not scanned.**

 3

#2188 opened 15 days ago by gayanper

 **Duplicate code actions (but with different kind)**

 7

#2177 opened on Jul 28 by mfussenegger

 **Unused variable included in the extracted method after using "Extract to method" code action**

`code-actions`

#2172 opened on Jul 22 by gayalkuruppu

[Code](#) [Issues 113](#) [Pull requests 26](#) [Discussions](#) [Actions](#) [Projects 3](#) [Wiki](#) [Security](#) [...](#)

COCOA v2.0.1リリース状況

#1031 by keiji was closed on Jun 17

 Closed  13

コントリビューター一覧に名前を載せる

#526 opened on Nov 27, 2021 by keiji

 Open  1 is:issue is:open Labels 20 Milestones 0[New issue](#) 113 Open  368 Closed

Author ▾

Label ▾

Projects ▾

Milestones ▾

Assignee ▾

Sort ▾

 遠距離の信号を接触判定および表示から除外することを検討する [enhancement](#)[waiting-for-confirmation](#)

#1121 opened 7 days ago by kvaluation

 5 [Android] 接触情報が正常に表示されない場合がある [bug](#) [help wanted](#) [in progress](#)[welcome-contribution](#)

#1113 opened 11 days ago by keiji

 19 V3DiagnosisApiで陽性情報登録をすると本来意図しない日付の診断キーを配信することになる [bug](#)[confirmed](#)

#1105 opened 20 days ago by keiji

 13 通知が表示されないケースを調査する [help wanted](#) [question](#) [waiting-for-confirmation](#)

#1104 opened 21 days ago by keiji

 3 「過去14日間の接触」画面を改善する [confirmed](#) [design](#)

#1103 opened 22 days ago by keiji

 1 全数届出見直しのCOCOAへの影響を検討する [waiting-for-confirmation](#)

#1101 opened 27 days ago by keiji

 4

[Android] 接触情報が正常に表示されない場合がある #1113

New issue



Open keiji opened this issue 11 days ago · 19 comments



keiji commented 11 days ago · edited ▾

Collaborator

...

不具合の内容 / Describe the bug

接触情報が正常に表示されない場合がある。

ホーム画面から「陽性登録者との接触結果を確認」をタップすると、過去14日間の接触画面には「陽性登録者との接触確認」と表示されるが、その下に表示されるべき「〇日間に合計〇分間の接触」の表示がない。

また、「陽性登録者との接触一覧」で遷移した先にも接触情報が表示される部分が空欄になっている。

動作ログを確認したところ、SecureStorageからデータを取り出すときに `Java.Lang.Exception: Signature/MAC verification failed` が発生している。

```
Failed to get from secure storage.,  
Exception: Java.Lang.Exception: Exception of type 'Java.Lang.Exception' was thro
```

再現手順 / Steps to reproduce

Assignees



keiji

Labels

bug

help wanted

in progress

welcome-contribution

Projects

None yet

Milestone

No milestone

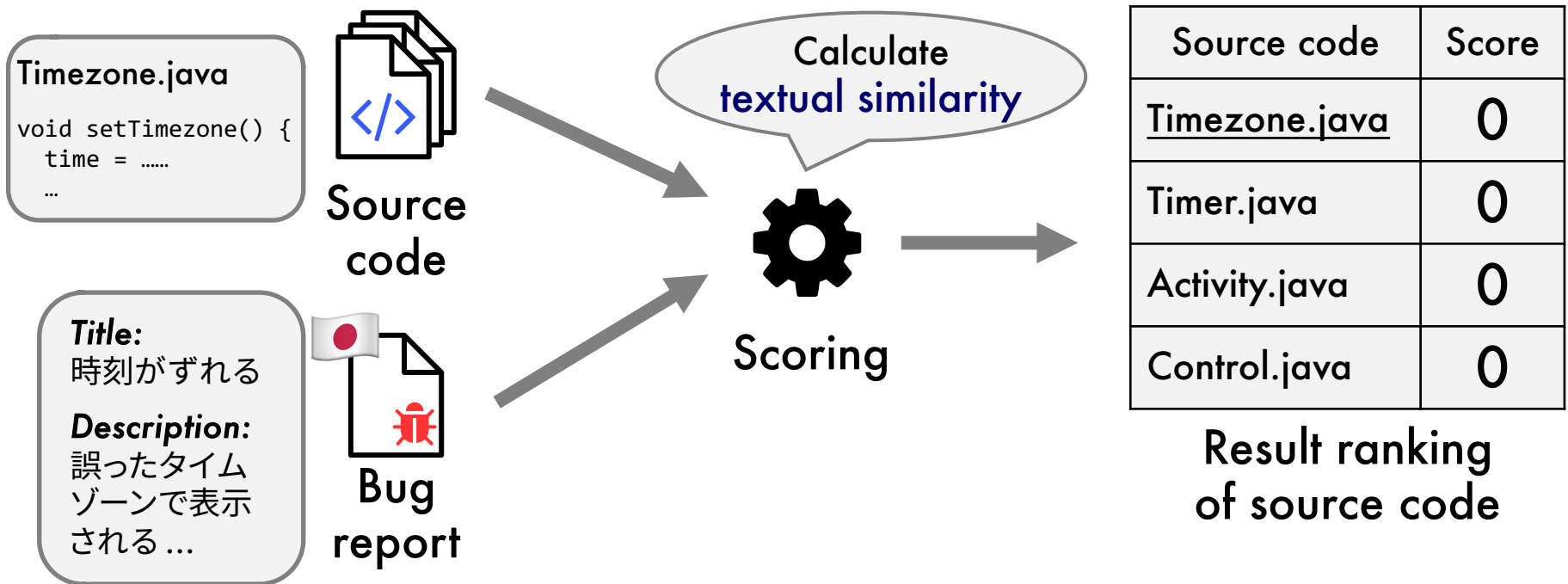
Development

No branches or pull requests

2 participants



Issues in IRBL for non-English bug reports



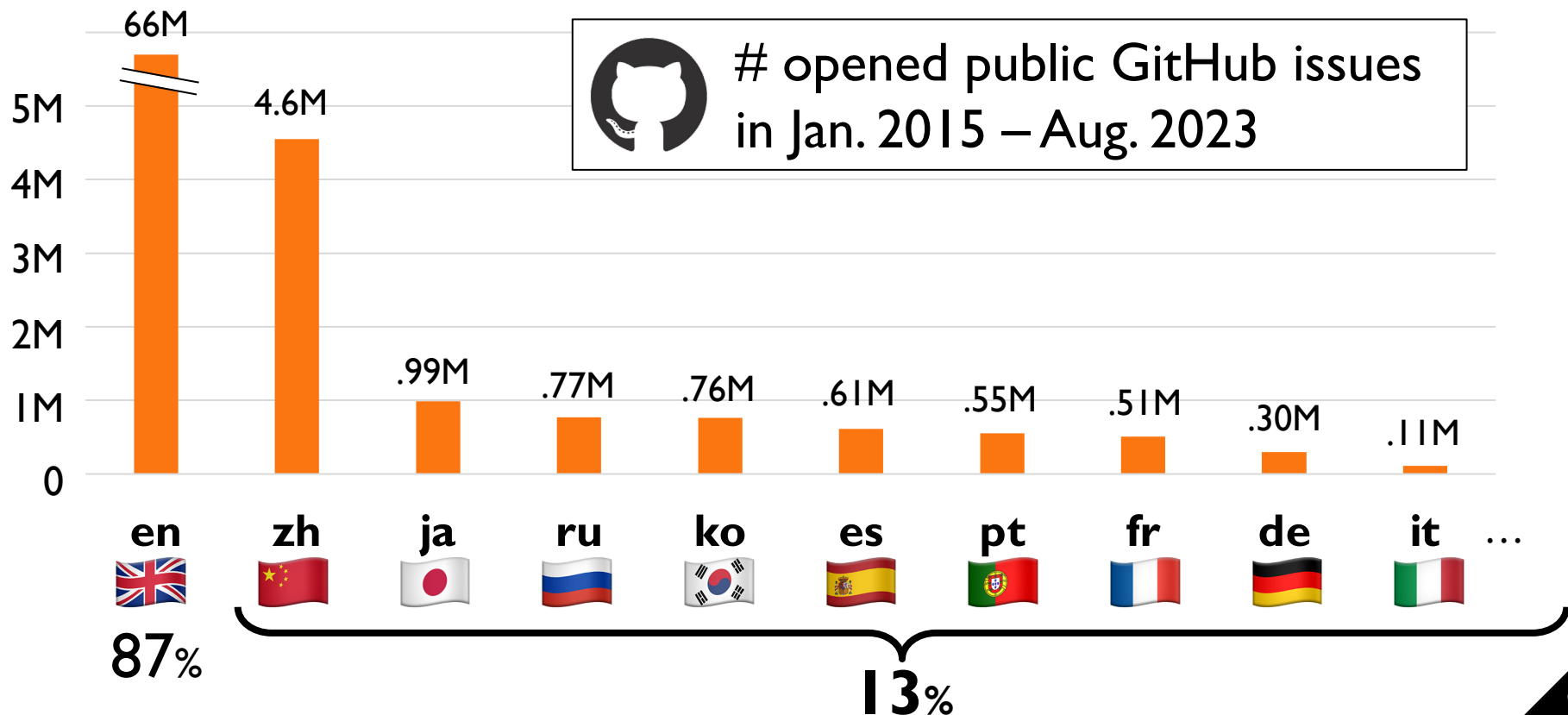
- Developers in non-English region may write bug reports in the language of their region (non-English)
- Typical IRBLs do not support such reports



Do developers write bug reports in non-English?

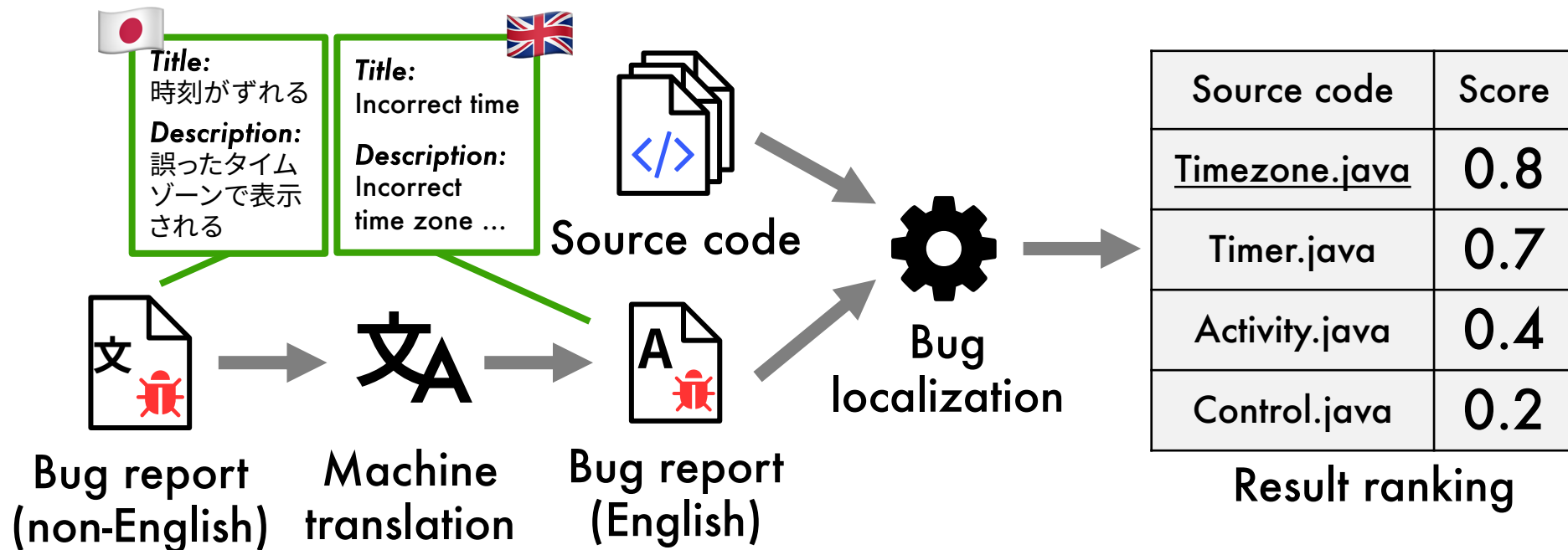
YES

- Particularly if stakeholders are within a specific language region



Cross-Lingual Bug Localization: CrosLocator [Xia+14]

- Mitigate the natural language gap via machine translation



How does it work for other languages/projects?

Base IRBL:
BugLocator [Zhou+12]

🇬🇧 English / OSS

Our study

🇯🇵 Japanese / Industry

Cross-lingual BL:
CrosLocator [Xia+14]

🇨🇳 Chinese / OSS



[Zhou+12] Zhou et al.: "Where should the bugs be fixed?" in Proc. ICSE 2012.

[Xia+14] Xia et al. "Cross-language bug localization." in Proc. ICPC 2014.

Observation: non-English texts exist also in source code

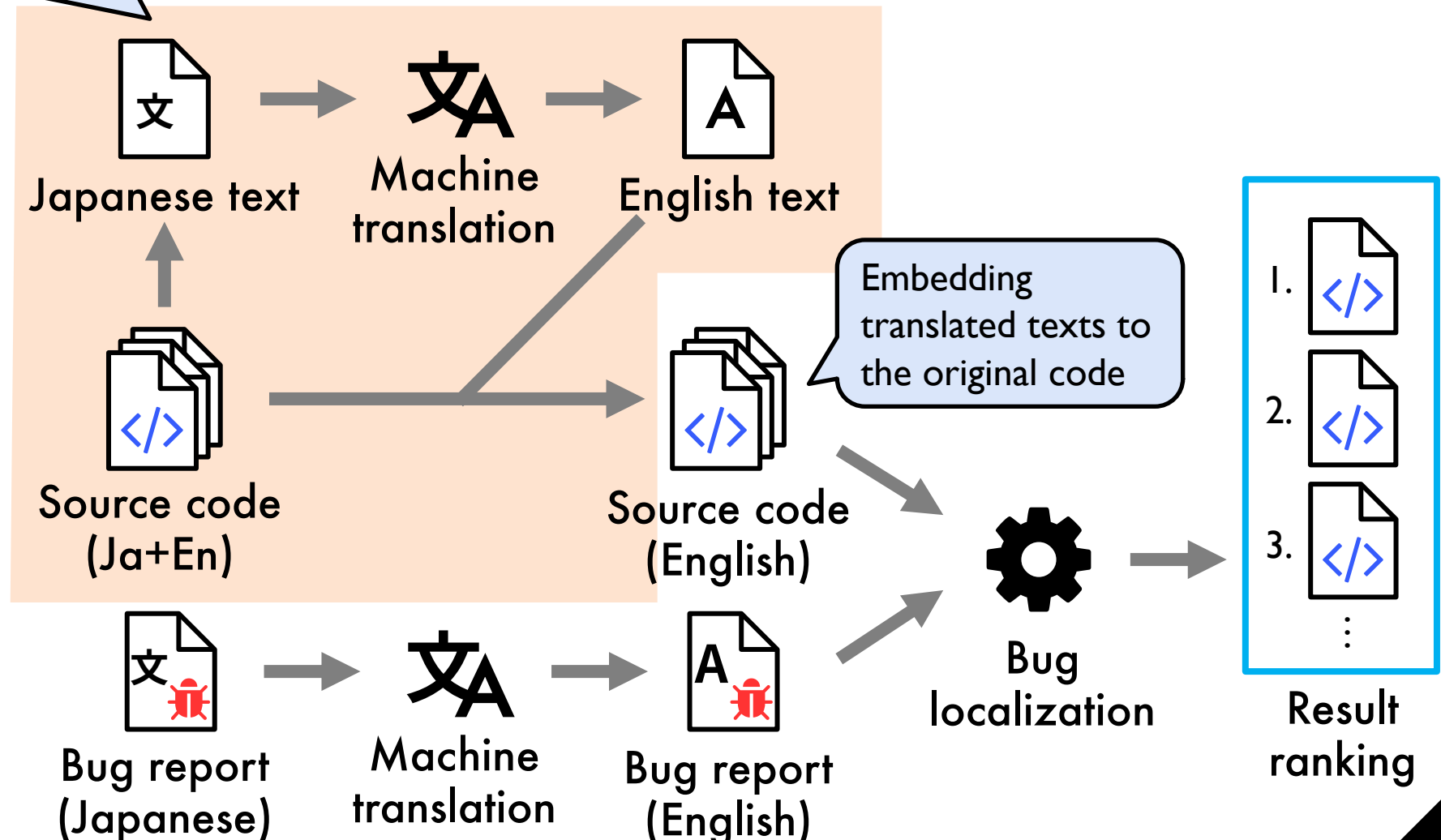
- **E.g., in string literals, comments**
 - They do not contribute to textual similarity to English-translated bug report description

```
public class InterfaceInstanceFactory {  
    /** ログ */  
    private static Log logger = LogFactory.getLog(InterfaceInstanceFactory.class);  
  
    /** キーに対する実装クラスを保持するマップ */  
    private static Map<String, Class<?>> keyMap = null;  
  
    /**  
     * シングルトンのインスタンスを管理するマップを取得  
     *  
     */  
}
```

Extending CrosLocator

Extracting string literals and comments written in Japanese

Our extension



Research Questions

RQ1 (Replication of CrosLocator)

Is the cross-lingual bug localization approach effective for industry projects?

RQ2 (Effectiveness of the extension)

Does translating texts in source files contribute to the performance improvement?

Study Design

- **Two industrial projects in Japan**

	Language	# source files	# bug reports
P_1	C#	929	8 / 186
P_2	Java	591	267 / 316

- Two types of oracles are defined in P_1
 - P_{1d} : Source files that directly includes buggy portion
 - P_{1i} : Source files that indirectly contribute to find buggy portion

- **Evaluation Criteria**

- MAP, MRR, Success@5, Success@10

RQ 1 Is cross-lingual BL effective for industry projects?

YES

Base IRBL:

BugLocator [Zhou+12]

🇬🇧 English / OSS

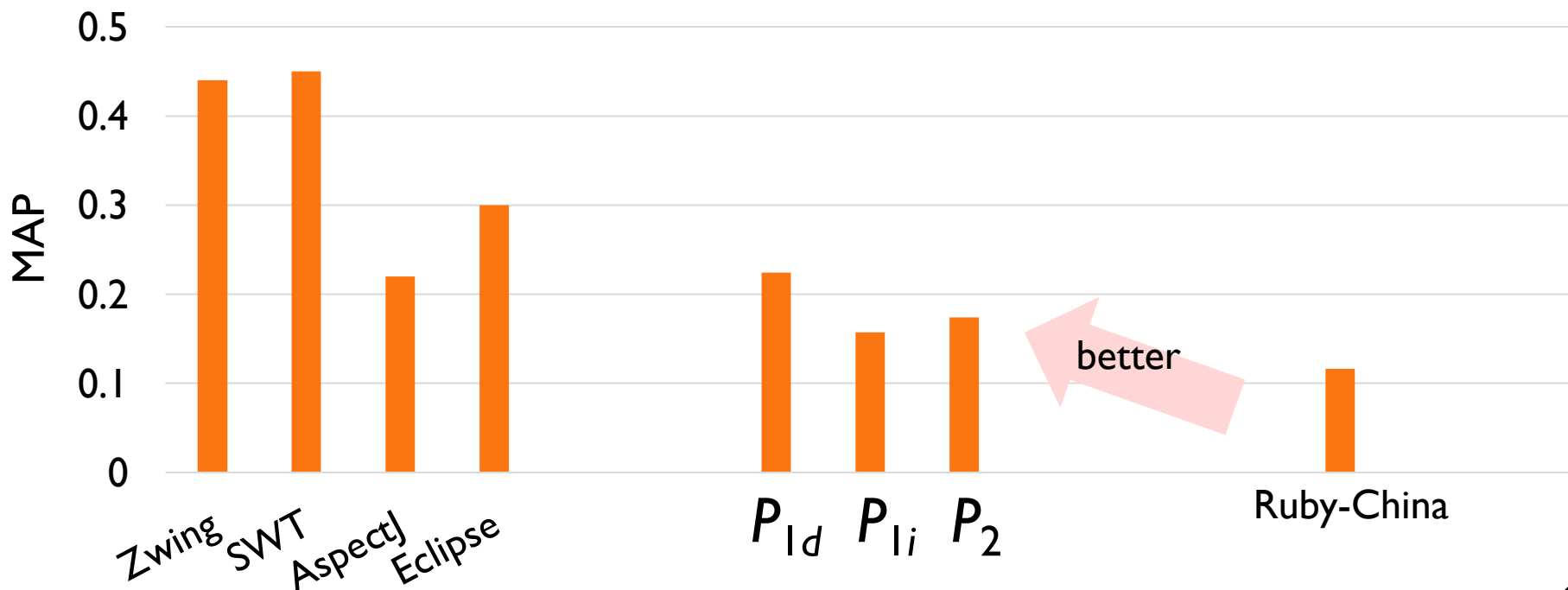
Our study

🇯🇵 Japanese / Industry

Cross-lingual BL:

CrosLocator [Xia+14]

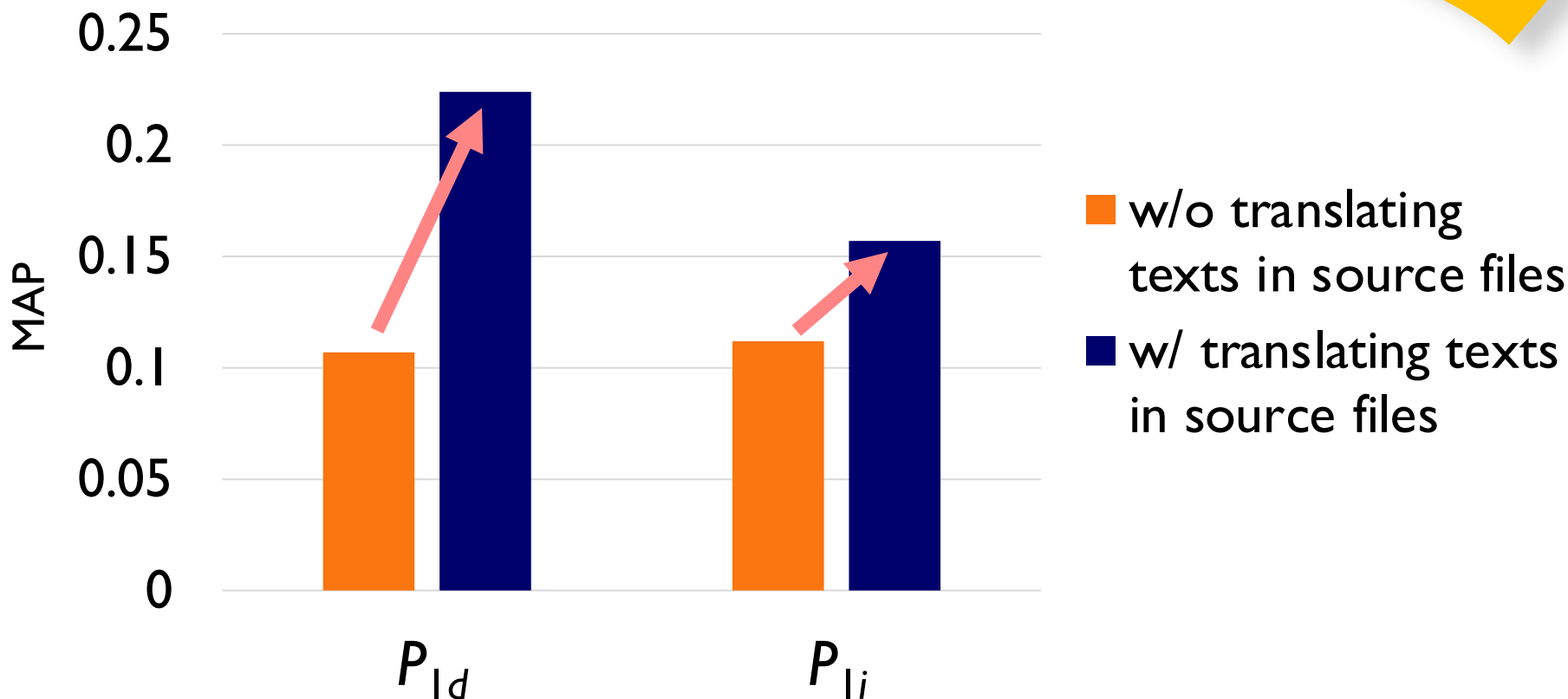
🇨🇳 Chinese / OSS



RQ 2

Does additional translation contribute to performance?

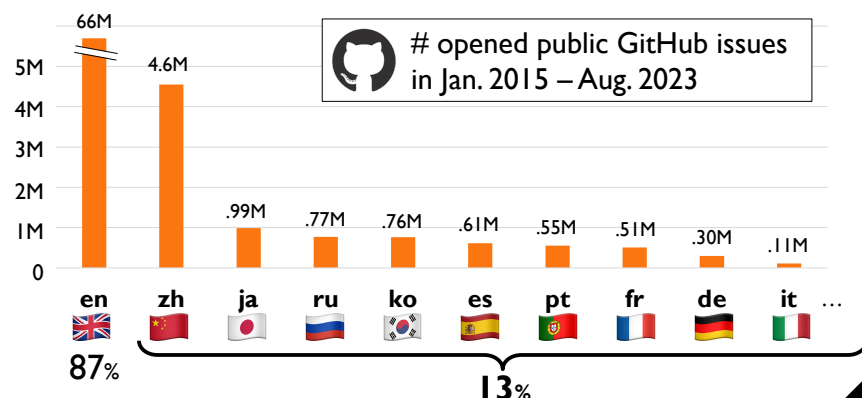
YES



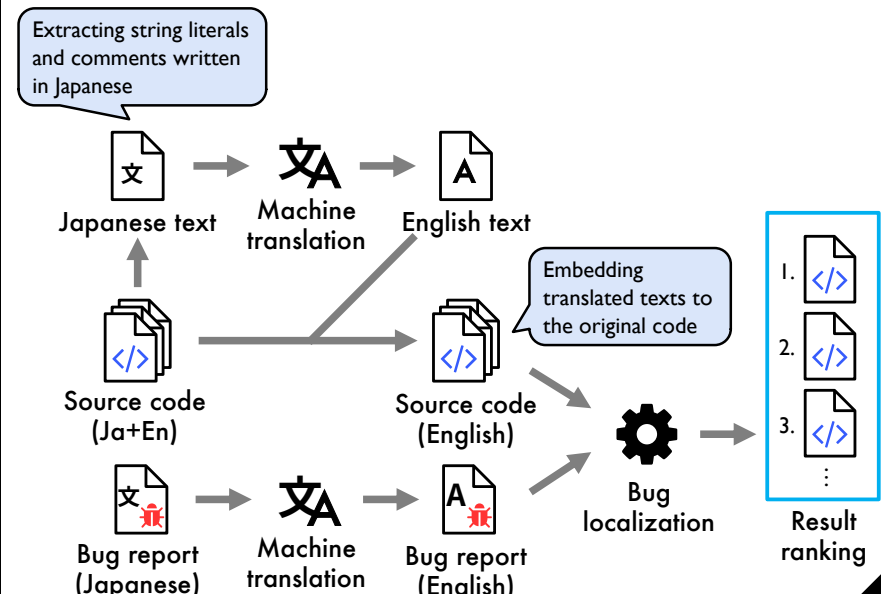
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YES

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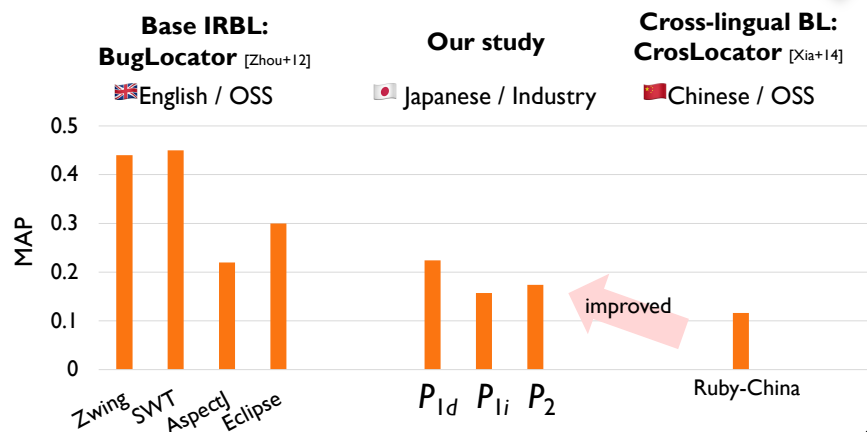


Extending CroSLocator



RQ 1 Is cross-lingual BL effective for industry projects?

YES



RQ 2 Does additional translation contribute to performance?

YES

