

BUMPER: Bug Metarepository Search Engine for Developers and Researchers

<https://bumper-app.com>

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Software are pledged to have bugs ...

- What do we do about it ?
 - Bug reports are submitted (Github, Bugzilla, JIRA, ...) and assigned
 - Who should fix this bug? - Anvik *et al.* 2006
 - Developer craft a bug-fix.
 - Toward an understanding of bug fix patterns - Pan *et al.* 2009
 - Where should the bugs be fixed? More accurate information retrieval-based bug localization based on bug reports - Zhou *et al.* 2012
 - Bug report closed / marked RESOLVED / FIXED
 - How long will it take to fix this bug? - Weiss *et al.* 2007
 - Characterizing and predicting which bugs get reopened - Zimmermann *et al.* 2012

What developers do when facing an unknow bug ?

- Open questions in face-to-face interviews with 10 undergrads, 5 graduates, 7 junior dev. & 3 senior dev.
 - ① When facing an unknown bug, crash or exception, where do you look for informations ?
 - ② When facing an unknown bug, crash or exception, what are you searching for ?
- Build an online multiple choices survey with their responses

Software are pledged to have bugs

- ① When facing an unknown bug, crash or exception, where do you look for informations ?
 - a) Online search engines (Google, Bing, ...).
 - b) Online specialized websites (Stackoverflow, ...)
 - c) Offline search (Books, Slides, ...).
 - d) Official documentation of the project / programming languages / api (Offline and Online).
 - ② When facing an unknown bug, crash or exception, what are you searching for ?
 - a) How to do X.
 - b) The exception yield by the crash / bug.
 - c) Official documentation of the project / programming languages / api (Offline and Online).
- 150 peoples and got 89 responses (59%)
 - <http://bit.ly/bumper-cser>

What developers do when facing an unknow bug ?

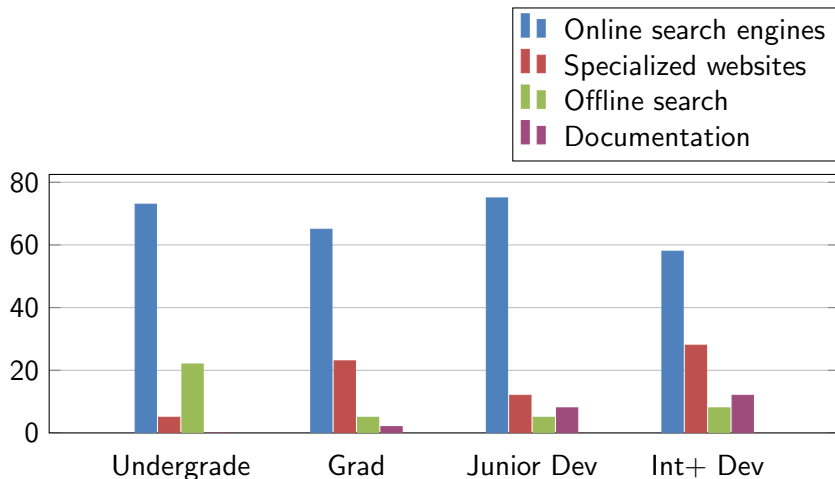


Figure : Answers to *When facing an unknown bug, crash or exception, where do you look for informations ?* in percentage

What developers do when facing an unknown bug ?

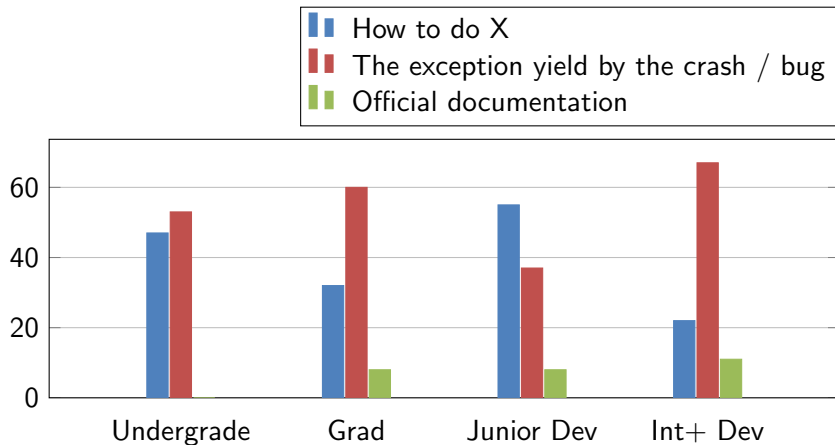


Figure : Answers to *When facing an unknown bug, crash or exception, what are you searching for ?* in percentage

What can we do to help ?

- What we have *learned*:
 - Go Online
 - Search for exception / How to do X
 - Often browse many websites / Bug repositories / Source code repositories to find a suitable solution

→ **All these informations are in bug reports and source versionning systems**

- BUMPER: Bug Metarepository Search Engine for Developers and Researchers
 - Online Search Engine with 1 million bug reports AND fixes from major open-source repositories
 - Apache Software Foundation, Netbeans, Eclipse, Gnome, FireFox, Chrome, Kde, ...
 - Imports bugs reports from Bugzilla, JIRA and Github, ... and fixes from SVN, Mercurial, Git, ...
 - Natural language for developers
 - Advanced API for researchers

Conclusion and Future work

- <https://bumper-app.com>
- 1 million bugs and associated fixes
- Apache Software Foundation, Netbeans, Eclipse, Gnome, FireFox, Chrome, Kde, ...
- Imports bugs from Bugzilla, JIRA and Github, ... and fixes from SVN, Mercurial, Git, ...
- Natural Language Search for developers
- Advanced API for researchers
- Currently assessing how much faster a suitable solution can be found using BUMPER rather than Google/Stack Overflow/Books ...

QUESTIONS?