More Common Than You Think: An In-Depth Study of Casual Contributors

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Marco Gerosa

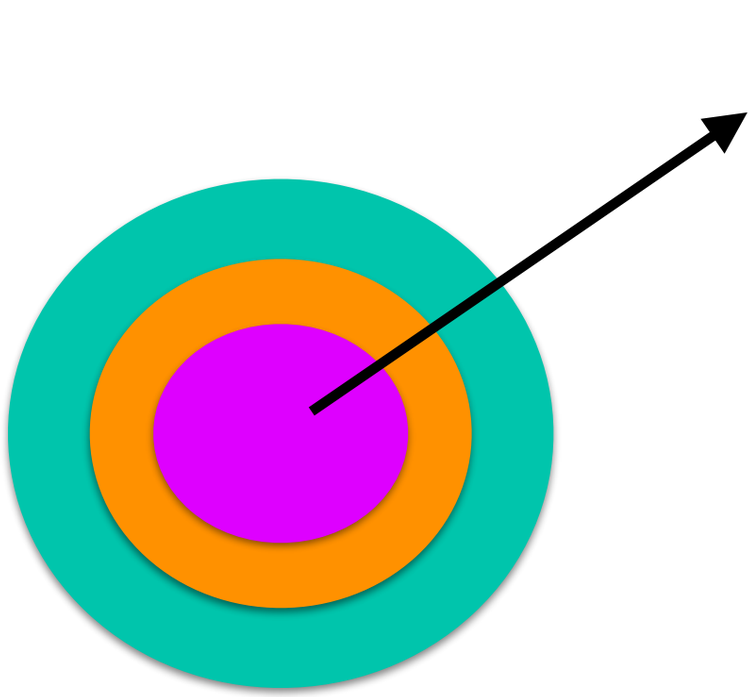
USP

General Structure of an OSS community

The “onion” patch

K. Nakakoji, Y. Yamamoto, Y. Nishinaka, K. Kishida, and Y. Ye. Evolution patterns of open-source software systems and communities. In Proceedings of the International Workshop on Principles of Software Evolution, 2002,

General Structure of an OSS community



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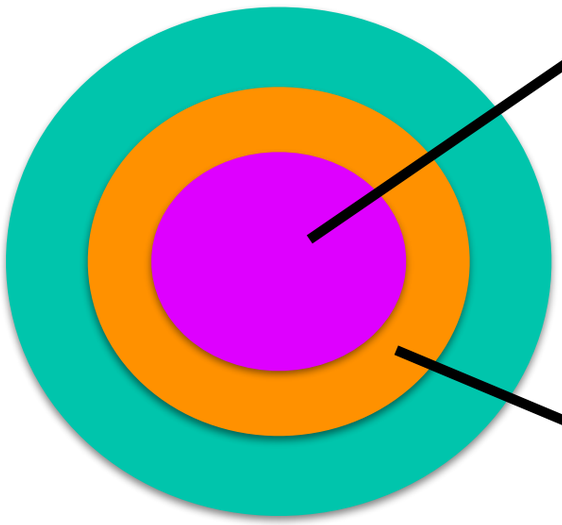
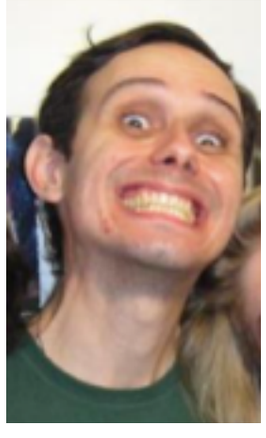


Core developers

Active developers



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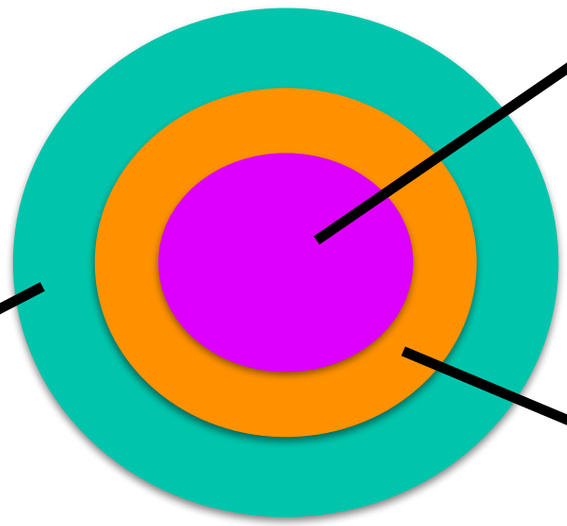
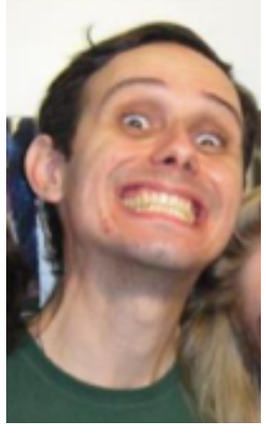


Peripheral developers

Active developers



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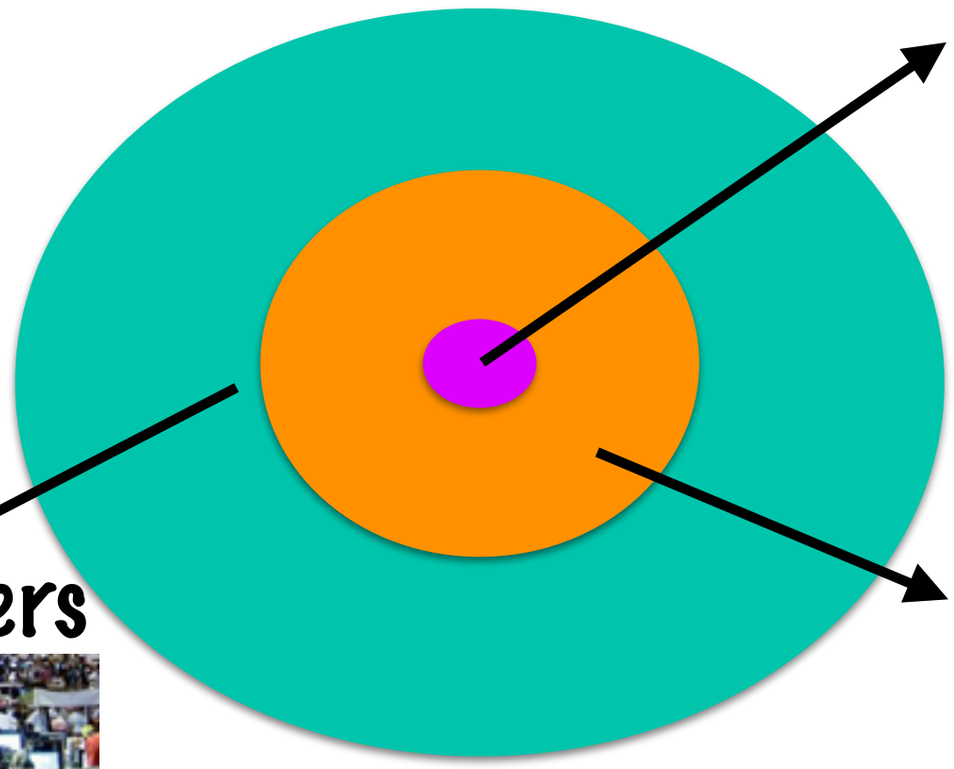

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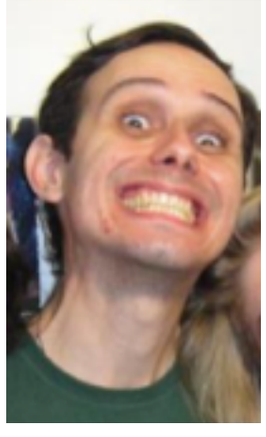

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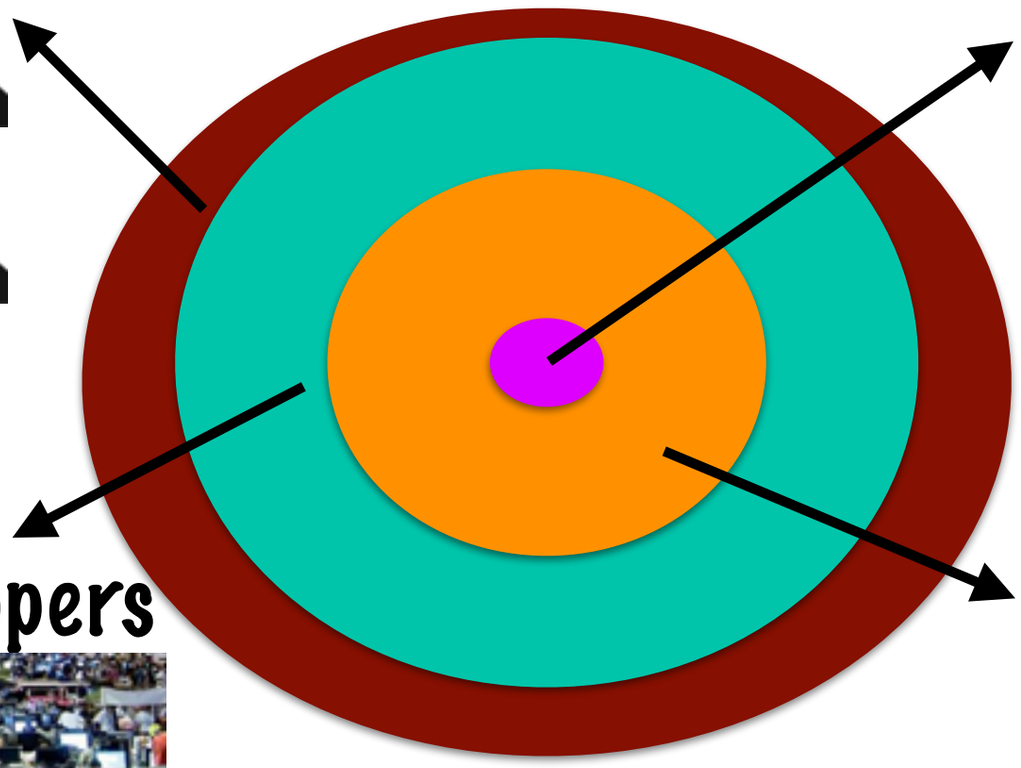

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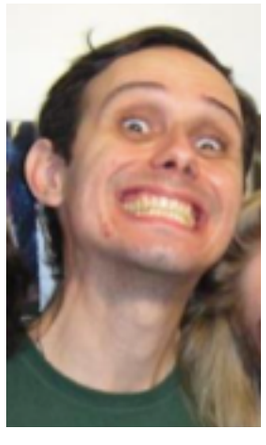

R. Pham, L. Singer, O. Liskin, F. Figueira Filho, and K. Schneider. Creating a shared understanding of testing culture on a social coding site. In Proceedings of ICSE'13.

Two Studies

Two Studies

C
C++
Clojure
CoffeeScript
Erlang
Go
Haskell
Java
JavaScript
Objective-C
PHP
Perl
Python
Ruby
Scala
TypeScript

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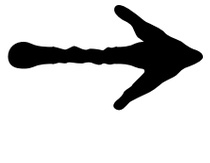
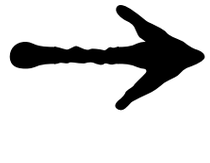
275
popular, non-trivial, OSS Projects

Two Studies

608 Core developers



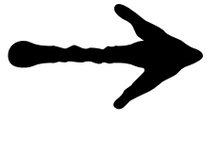
5 questions



10.2%
Response Rate

Two Studies

608 Core developers



5 questions

10.2%
Response Rate

760 Casual contributors

9 questions

26.7%
Response Rate

Two Studies

608 Core developers

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760 Casual contributors

Barbara Kitchenham

26.7%
Response Rate

Research Questions

RQ1. How common are casual contributions in OSS projects?

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RQ2. What are the characteristics of a casual contribution?

Showing **5 changed files** with **13 additions** and **8 deletions**.
Showing **5 changed files** with **39 additions** and **39 deletions**.
Showing **5 changed files** with **23 additions** and **5 deletions**.
Showing **2 changed files** with **3 additions** and **3 deletions**.
Showing **2 changed files** with **0 additions** and **4 deletions**.

+ 384 casual contribs (95% confidence level ±5% confidence interval)

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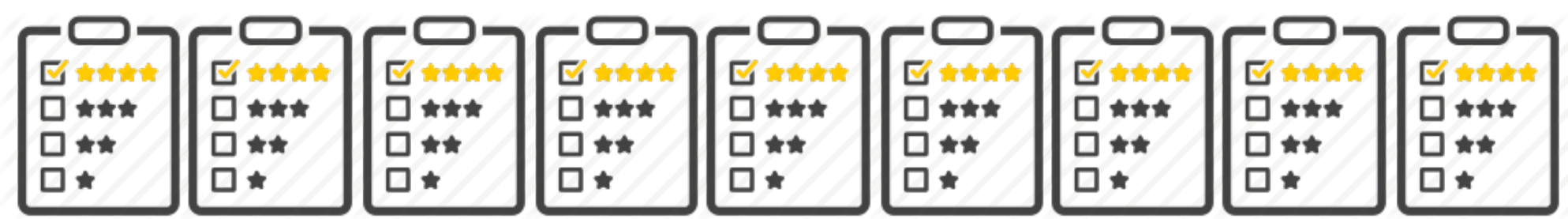
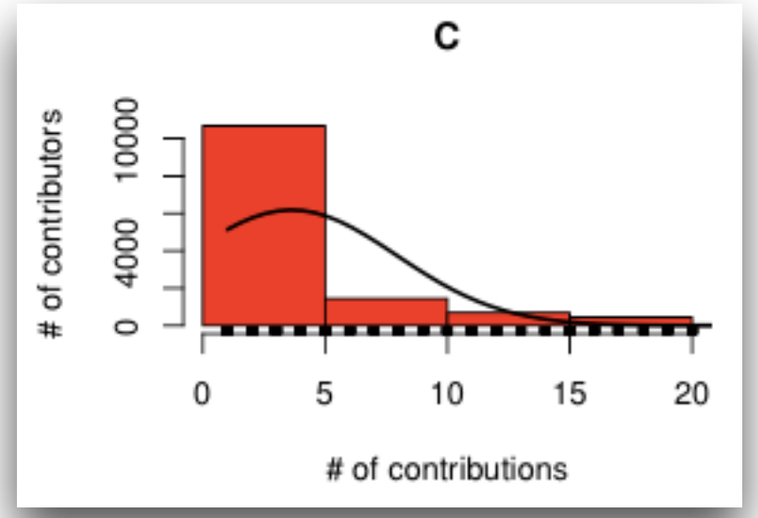
RQ3. How do casual contributors and project maintainers perceive casual contributions?

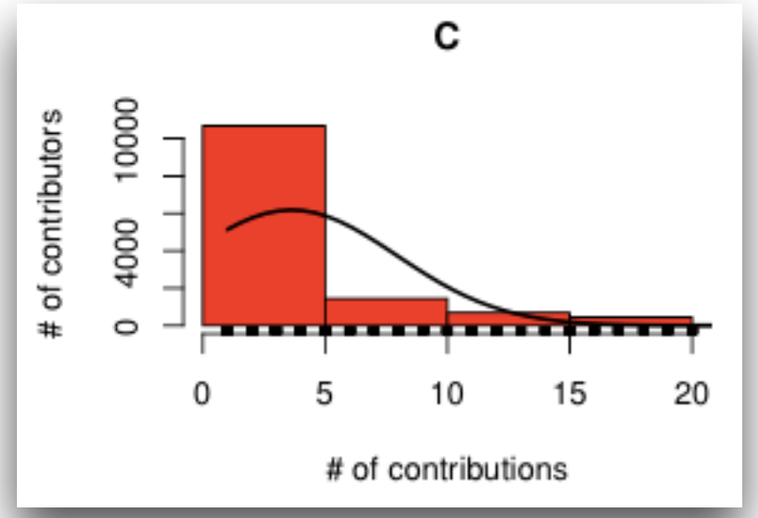


RQ1. How common?



Contributions	% Devs
1	39.55%
5	67.31%
10	76.39%
15	80.73%
20	83.51%

RQ1. How common?



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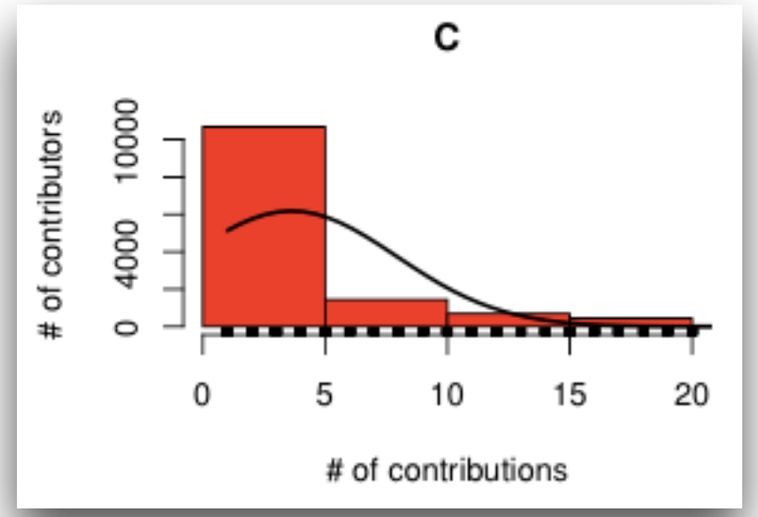
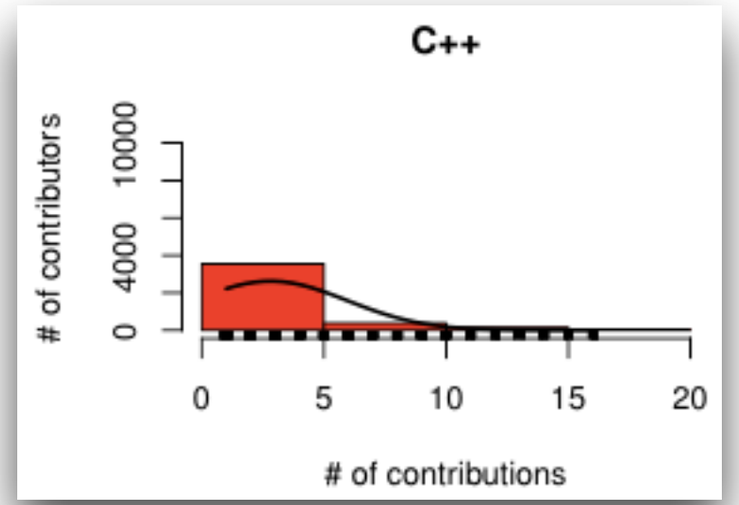
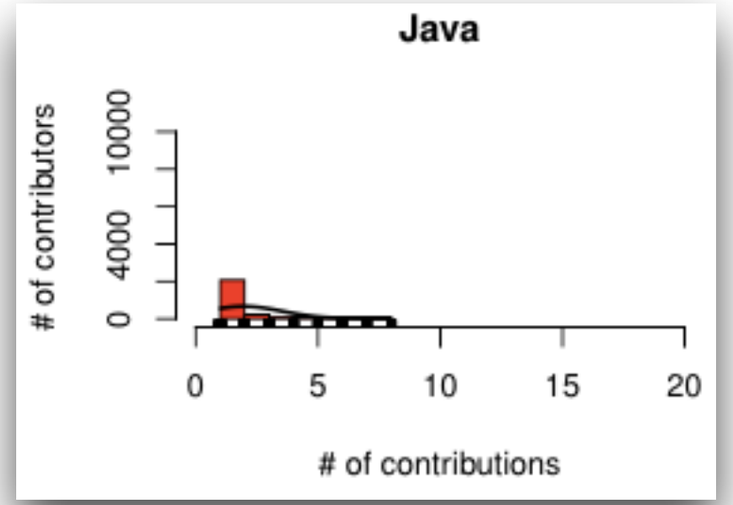


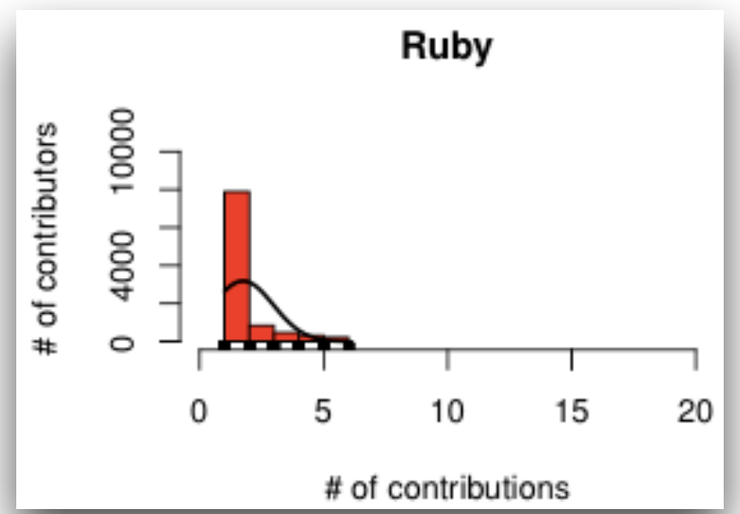
39.55%



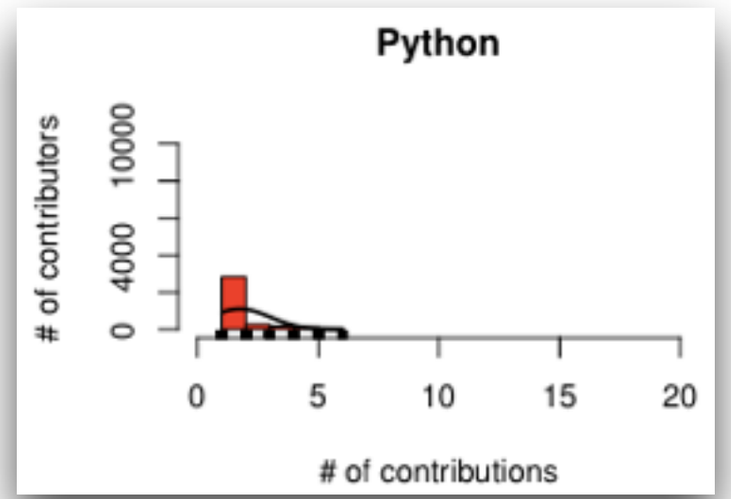
44.18%



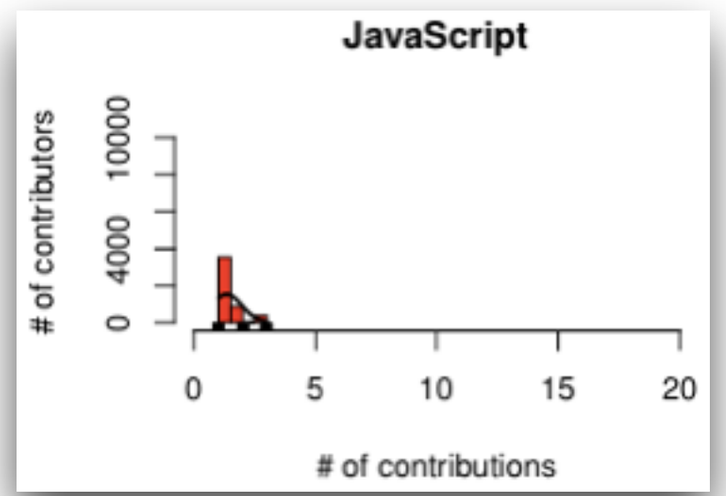
51.36%



54.51%

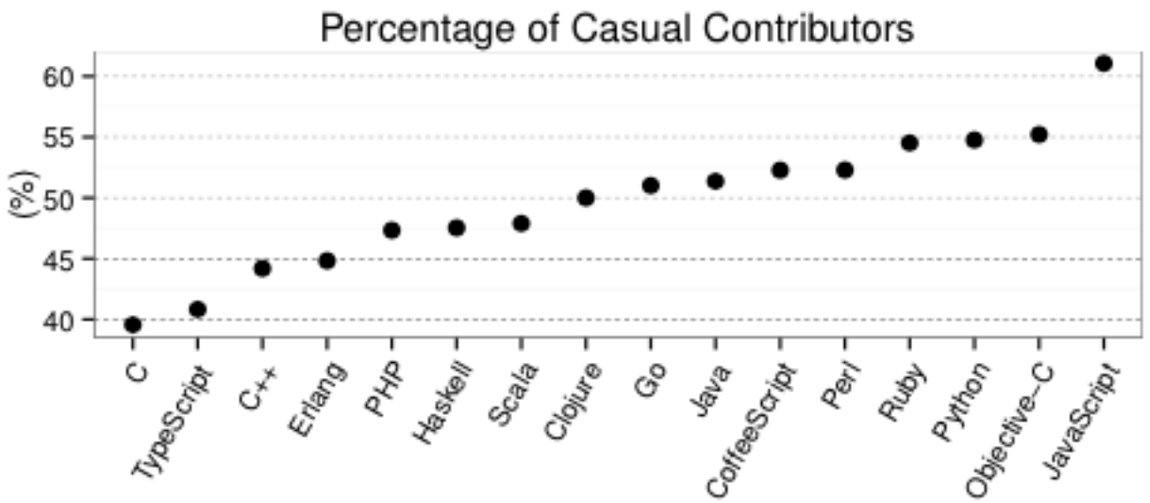


54.76%



61.06%

RQ1. How common?



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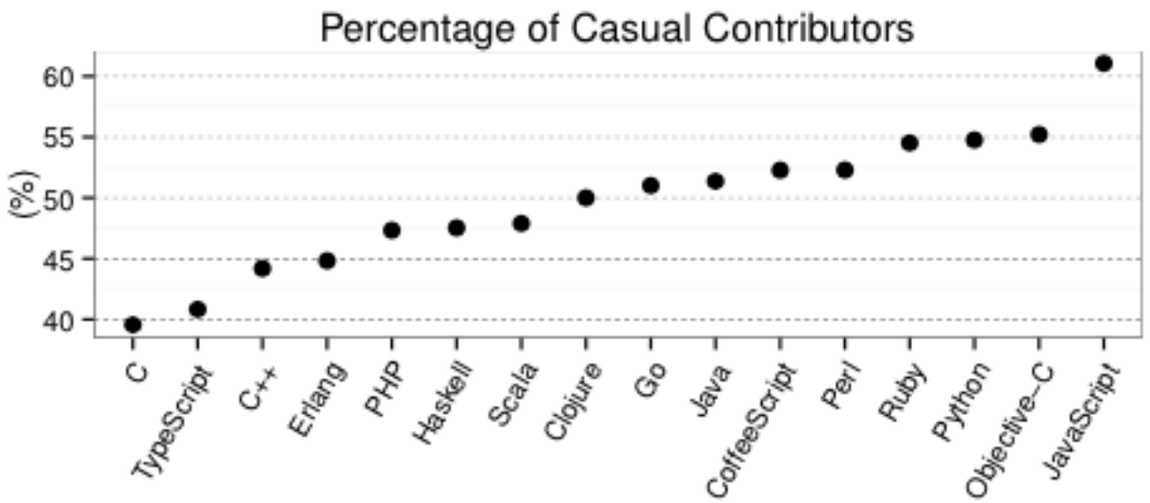
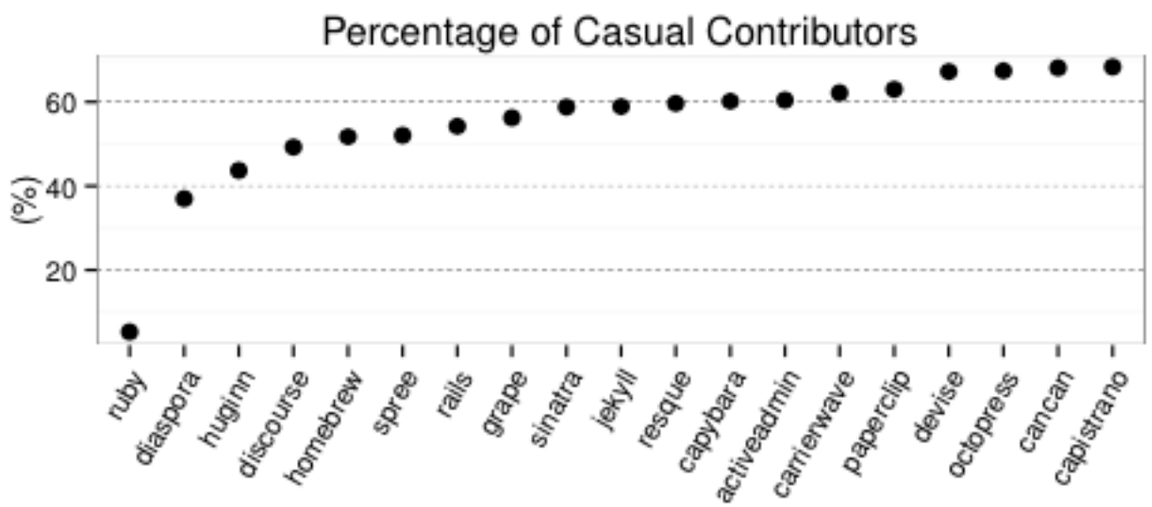
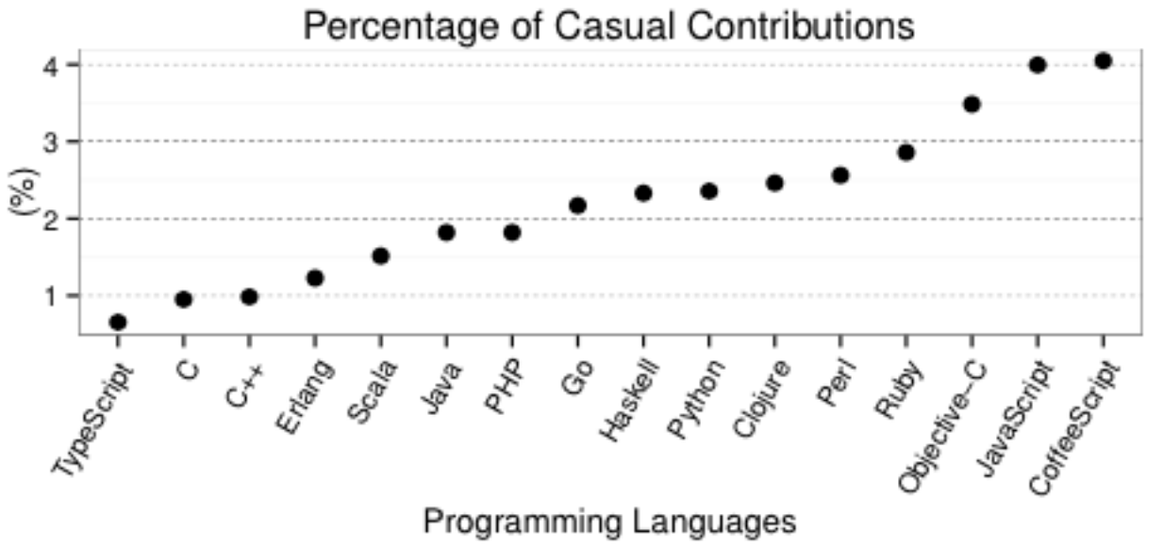
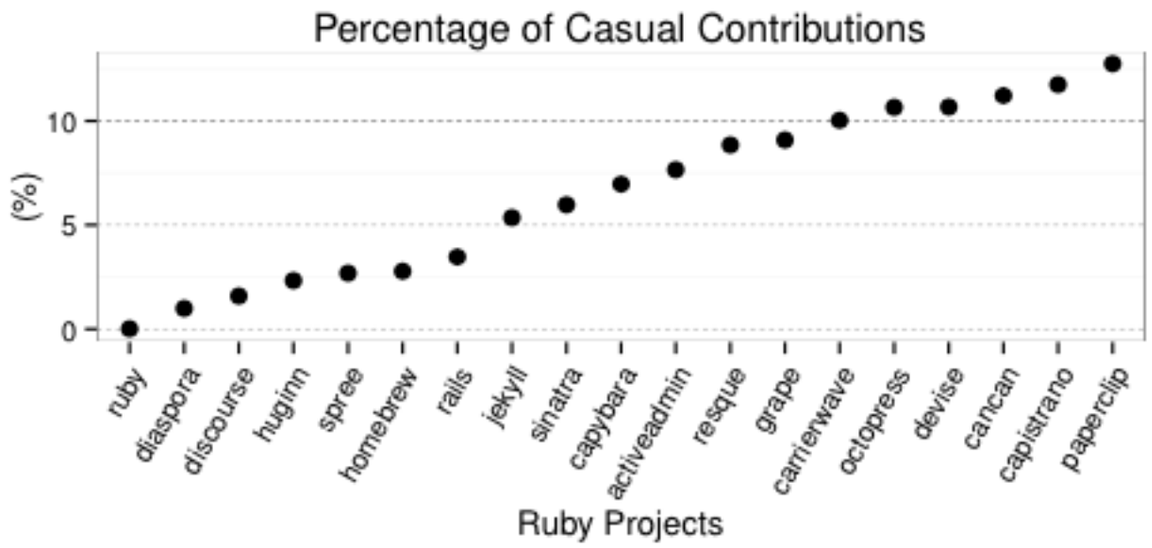








RQ2. Characteristics

32,729
casual contributions

384
statistically representative casual contributions

95% confidence level
±5% confidence interval

Category	#	%
Bug Fix	116	30.20%
Documentation	110	28.64%
Add New Feature	72	18.75%
Refactoring	34	8.85%
Update Version/Dependencies	25	6.51%
Improve Error/Help Messages	14	3.64%
Improve Resource Usage	8	2.08%
Add test cases	5	1.30%

RQ2. Characteristics

Bug fix (116 occurrences)

Added single quote to the chars to escape

Browse files

Ran into some issues with sending an unescaped apostrophe,
but by adding it to the list of characters to escape, this problem
is

[PATCH] ppc32: fix destroy_context() race condition

Browse files

```
Fix for a race condition when a task gets preempted by another task while
executing the destroy_context(...) in a FEW_CONTEXTS environment.
mm->context == NO_CONTEXT but the context_map may indicate all contexts are
in use.

The solution to this problem is to disable kernel preemption while
destroying a MMU context.

Signed-off-by: Guillaume Autran <gautran@mrv.com>
Acked-by: Benjamin Herrenschmidt <benh@kernel.crashing.org>
Signed-off-by: Andrew Morton <akpm@osdl.org>
Signed-off-by: Linus Torvalds <torvalds@osdl.org>
```

master v4.4-rc1 ··· v2.6.13-rc4

Guillaume Autran committed with Linus Torvalds on Jul 13, 2005 — 1 parent 88bd512 commit ddca3b80cef36cc668f924ef5154a79acb19ebd7

RQ2. Characteristics

Documentation (110 occurrences)

Typos + grammatical fixes

master (#77) v1.4.0 ··· v0.3.1

Browse files

Update fr.coffee

master (#190)

Browse files

veritable committed on Jan 14, 2014 — 1 parent f4a2209 commit 237b97ac5a449e093d0589dd7481f58ced70d41a

Showing 1 changed file with **32 additions** and **32 deletions**.

Unified | Split

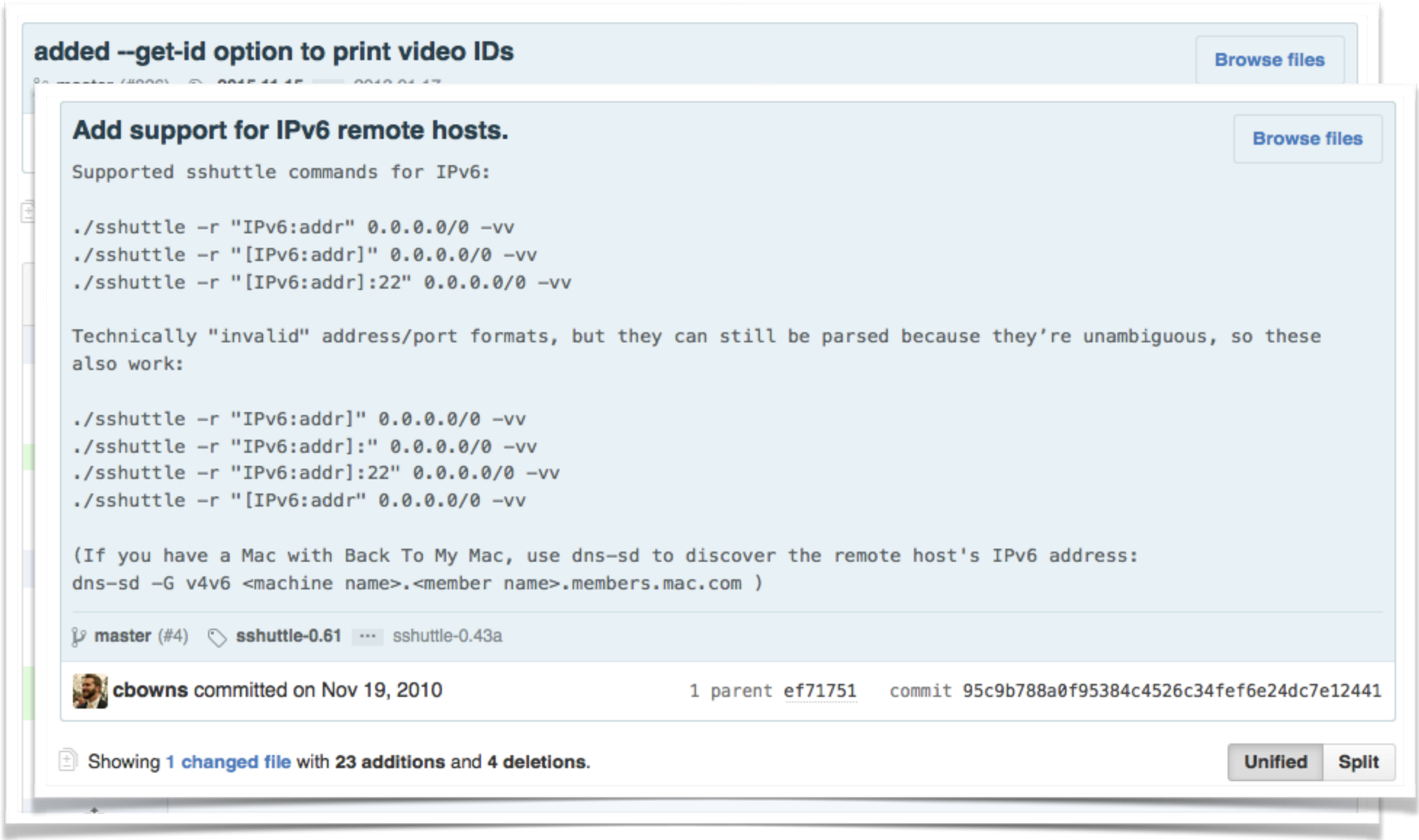
64 app/locale/fr.coffee — View

```
@@ -1,15 +1,15 @@
 module.exports = nativeDescription: "français", englishDescription: "French", translation:
   common:
     loading: "Chargement..."
-#    saving: "Saving..."
-#    sending: "Sending..."
+    saving: "Sauvegarde..."
+    sending: "Envoi..."

   modal:
     close: "Fermer"
     okay: "Ok"
```

RQ2. Characteristics

Add New Feature (72 occurrences)



RQ2. Characteristics

Refactoring (34 occurrences)

USB: digi_acceleport further buffer clean up Browse files

```
Some further cleanup after Oliver's patch to update the tty
```

Reafactor creation hash with default value in Rakefile Browse files

```
Pass default value as parameter for initializer rather than passing proc
```

master (#827) v1.4.6 v1.4.5

ka8725 committed on Jan 18, 2014 1 parent 536fe59 commit f175d8f3f48062806b6e1388592e5bc0c5e661b5

Showing 1 changed file with **1 addition** and **1 deletion**. Unified Split

2 Rakefile View

```
@@ -111,7 +111,7 @@ end
111 111  desc "list of authors"
112 112  task :authors, [:commit_range, :format, :sep] do |t, a|
113 113    a.with_defaults :format => "%s (%d)", :sep => ", ", :commit_range => '--all'
114     -  authors = Hash.new { |h,k| h[k] = 0 }
    114 +  authors = Hash.new(0)
115 115    blake   = "Blake Mizerany"
116 116    overall = 0
117 117    mapping = {
```

RQ3. Perception

Motivation

Casual Contributors

"Scratch their own itch" (45%)
"Give back to community" (XX%)
"Gain reputation" (XX%)

Maintainers

"Scratch their own itch" (35%)
"Easy contribution process" (14%)

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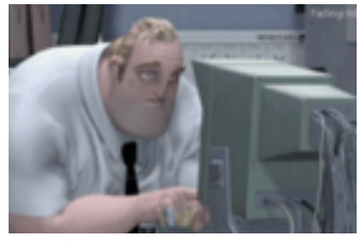
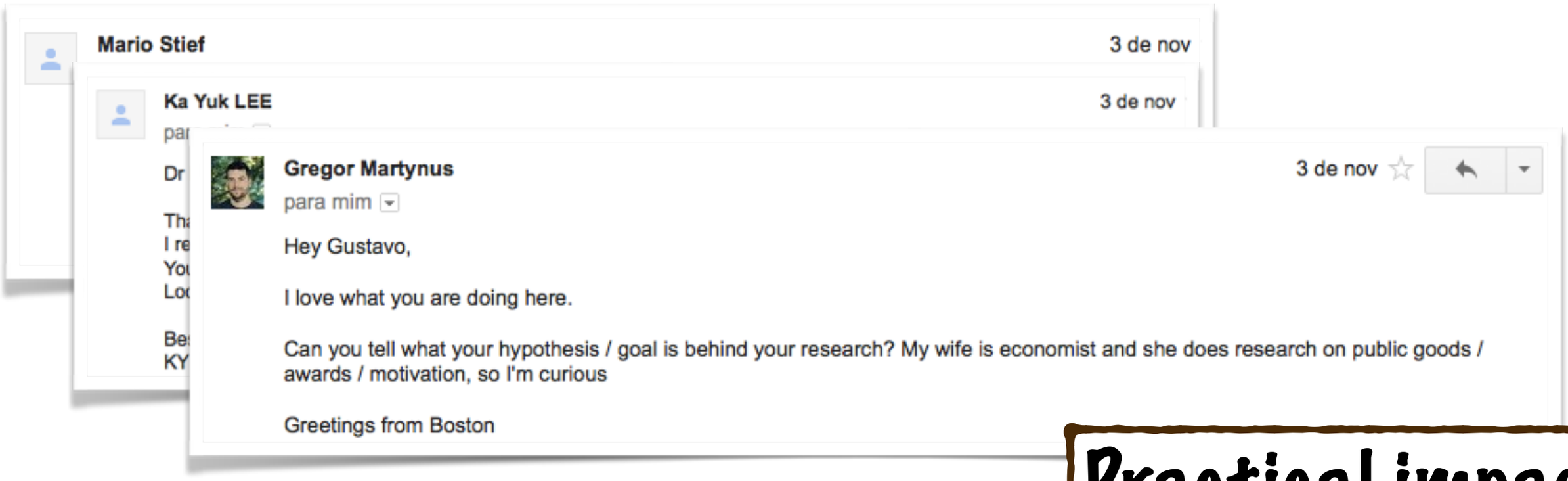


Not quite contributions, but...

1. (Super?) High response rate

2. All developers that answered our survey left the email address to receive the research results

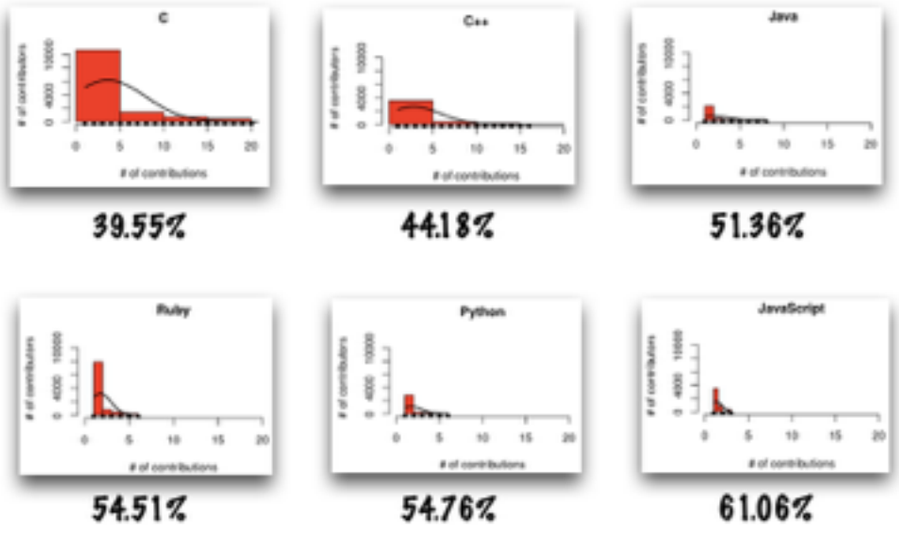
3. 50+ developers congratulated us for conducting this study



Practical impact?

In Summary

RQ1. How common?



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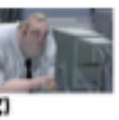

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