



“Wait For It”

Determinants of Pull Request Evaluation Latency on GitHub

Yue Yu, Huaimin Wang, Vladimir Filkov,
Prem Devanbu, Bogdan Vasilescu



國防科學技術大學
National University of Defense Technology

UC DAVIS
UNIVERSITY OF CALIFORNIA

GitHub workflow



Main
branch

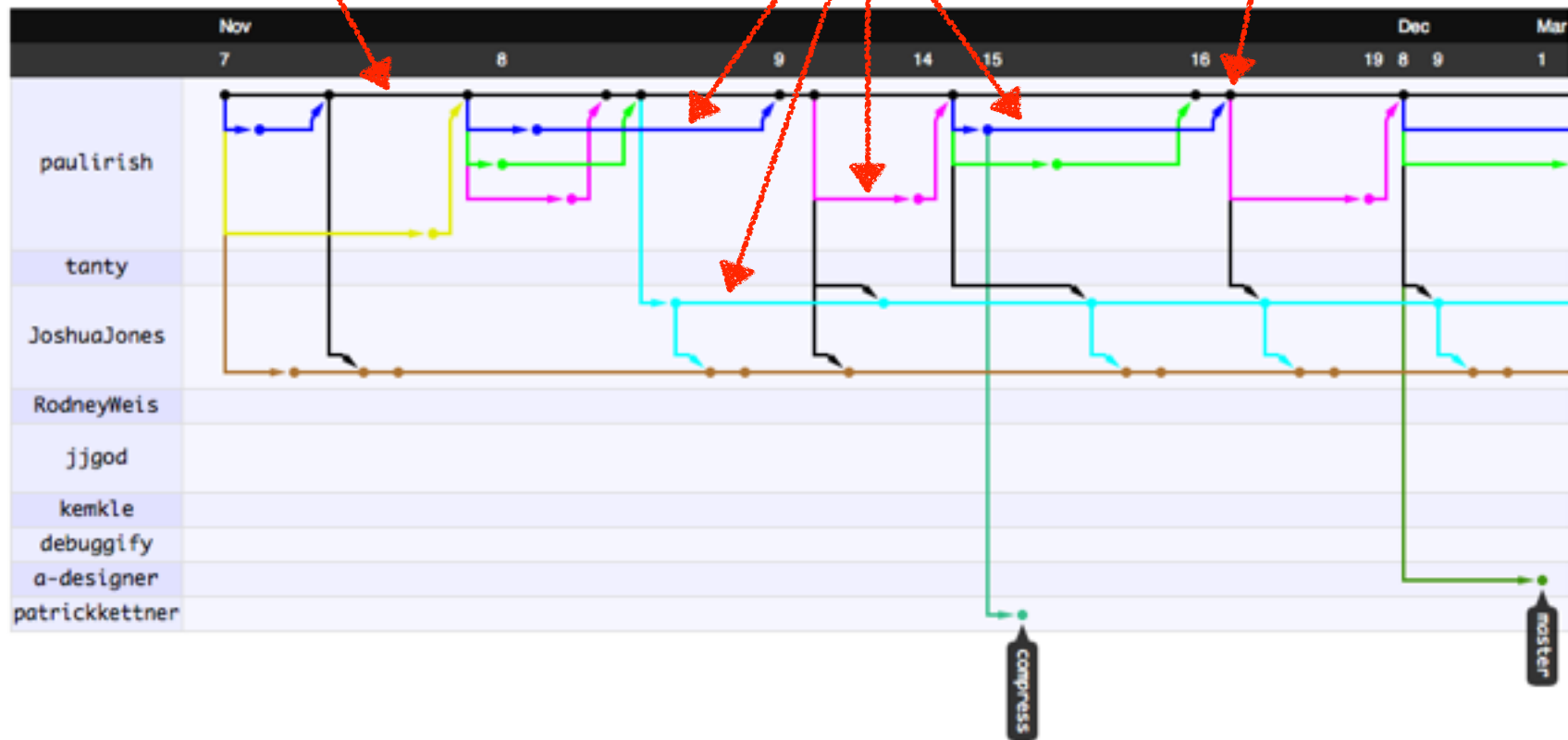
Personal
branches /
forks



Paul Irish

ac11a208fe604d3d70887521ee50c520ab744f8b

Merge pull request #10 from patrickkettner/master



Lots of pull requests to review



 rails / rails

 Watch ▾

1,887

★ Star

26,093

 Fork

10,339

Issues

Pull requests

Labels

Milestones

Filters ▾

 is:pr is:open

New pull request

 **467 Open** ✓ 12,551 Closed

Author ▾

Labels ▾

Milestones ▾

Assignee ▾

Sort ▾

 **Move Integer#positive? and Integer#negative? query methods to Numeric** ✓

#20143 opened an hour ago by meinac

 2

 **Deprecate `assert_template`.** ✓

#20138 opened 9 hours ago by tgxworld

 8

 **Add Enumerable#map_with to ActiveSupport** ✓

#20134 opened 13 hours ago by mlarraz

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 **Allow creating a save callback for same name with parent association** ✓

#20127 opened 23 hours ago by meinac

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 **ActiveSupport::HashWithIndifferentAccess select and reject should return enumerator if called without block** ✓

#20125 opened a day ago by imanel

 0

 **Don't ignore false values for `include_blank` passed to `Tags::Base#select_content_tag`** ✓

#20124 opened a day ago by greysteil

 9

 **Fix for irregular inflection inconsistency** ✓

#20123 opened a day ago by yoongkang

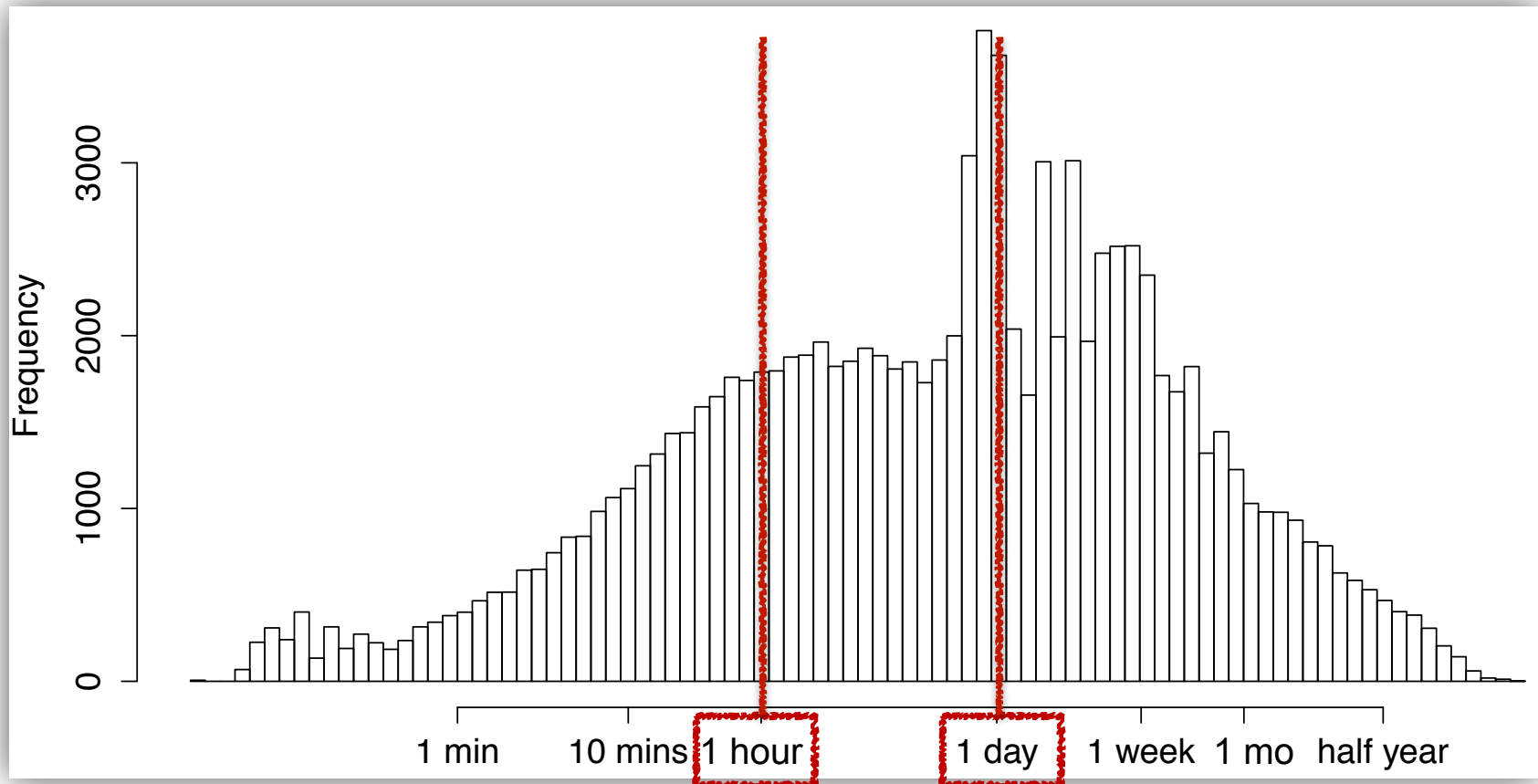
 0

 **Add openssl_verify_mode and sync other smtp_settings with API docs** ✓

#20117 opened 2 days ago by jfine

 0

Pull Request evaluation time



Continuous integration



 rails / rails

 Watch ▾

1,887

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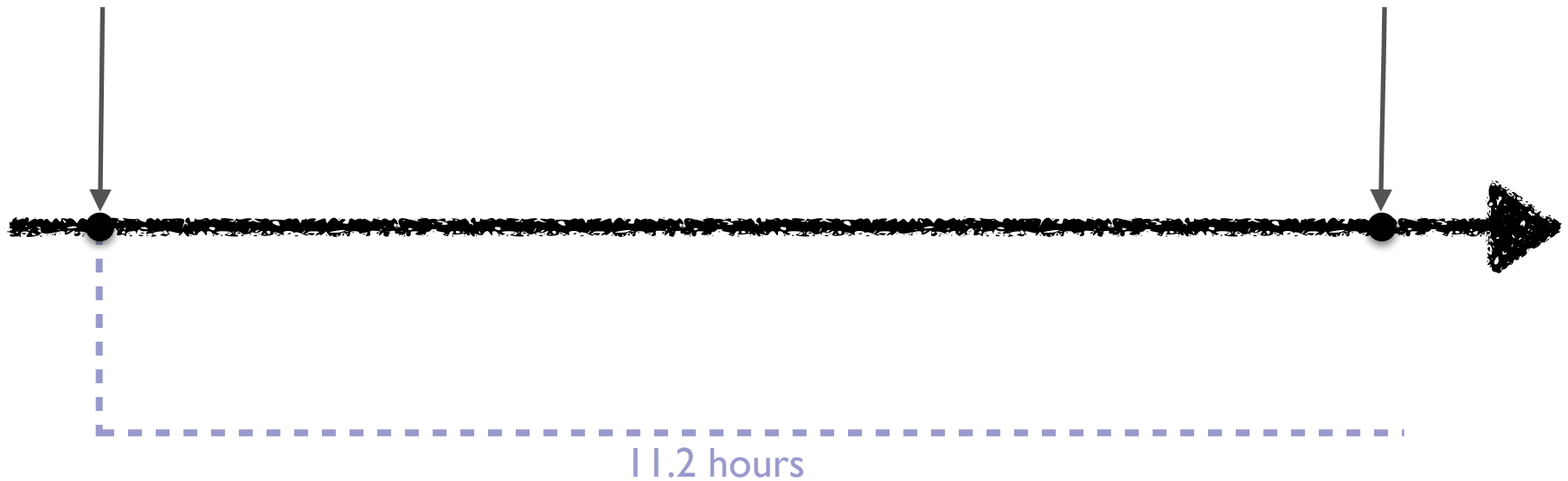
Automated testing &
continuous integration

Median Pull Request times

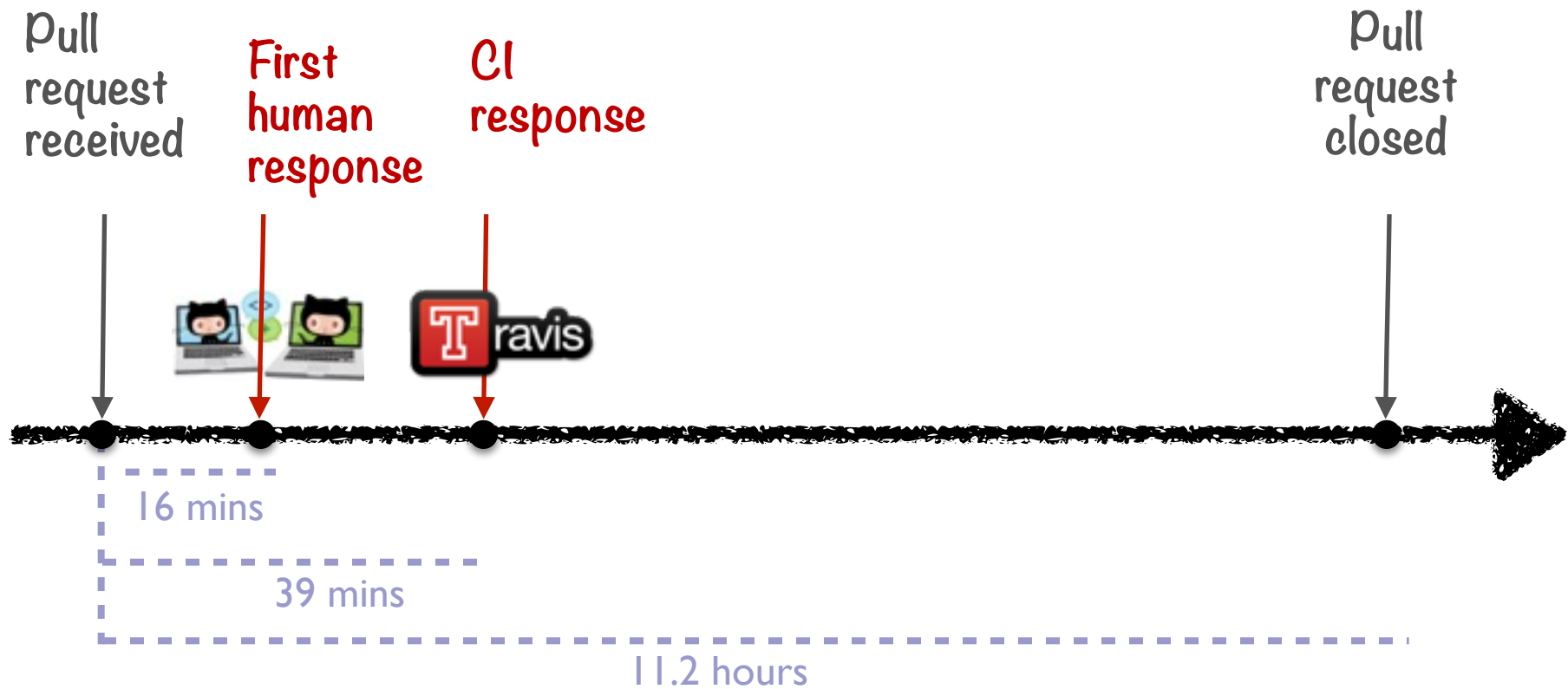


Pull
request
received

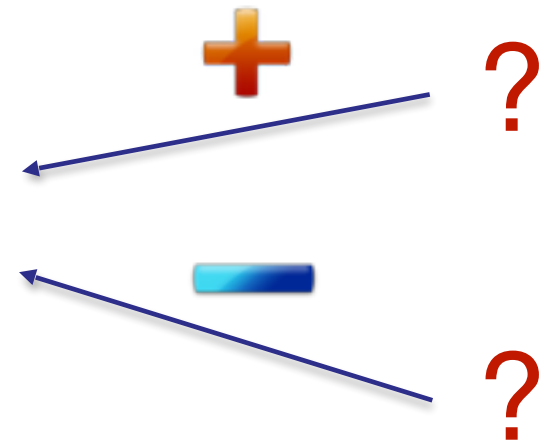
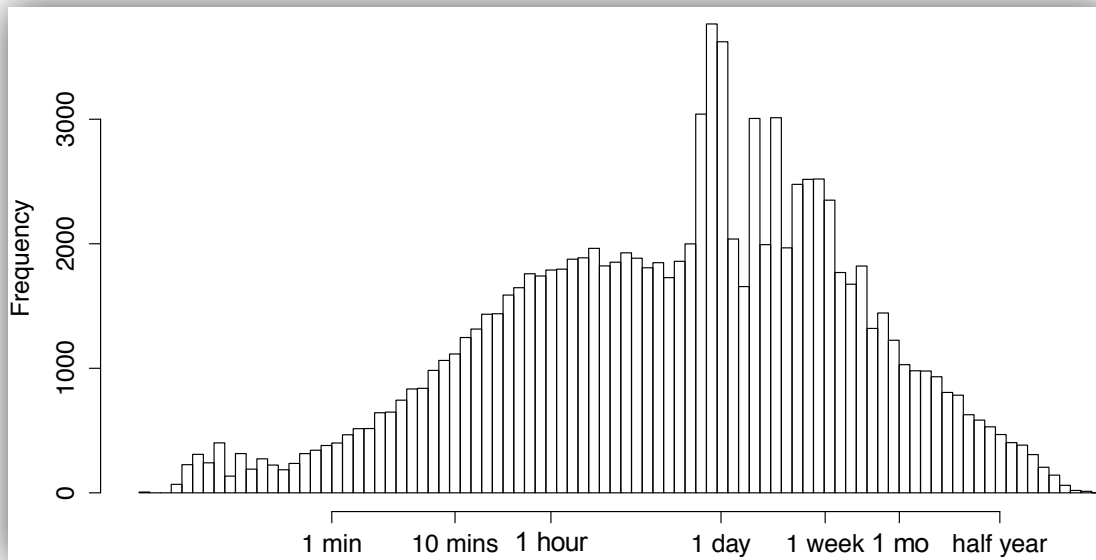
Pull
request
closed



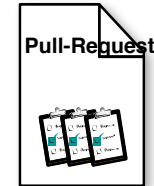
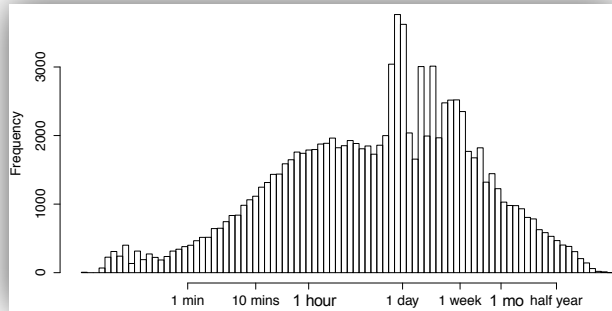
Median Pull Request times



What influences PR evaluation time?



Modeling the Pull Request evaluation time



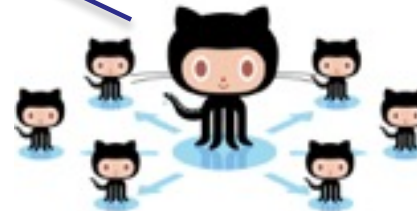
Size

- n_additions
- n_commits



Review

- n_comments



Experience & Social Connections

- merge_rate
- connection_strength
- n_followers

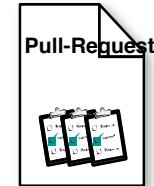
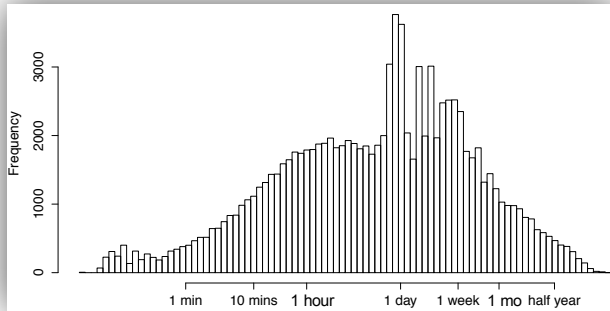
[Gousios et al, ICSE'14, ICSE'15]
[Tsay et al, ICSE'14, FSE'14]

Modeling the Pull Request evaluation time



MI: Previously-identified factors

✓ $R^2 = 36.2\%$



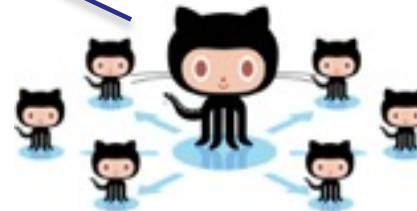
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Experience & Social Connections

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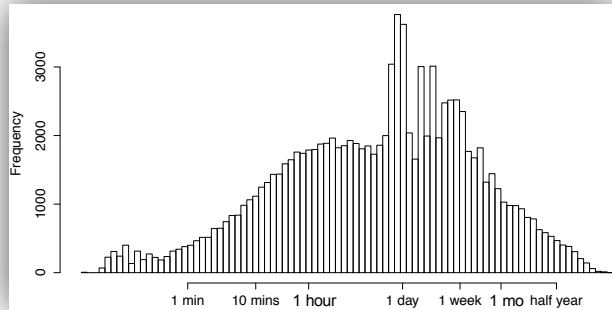


M2: M1 + process-related factors
+ continuous integration



**Title &
description**

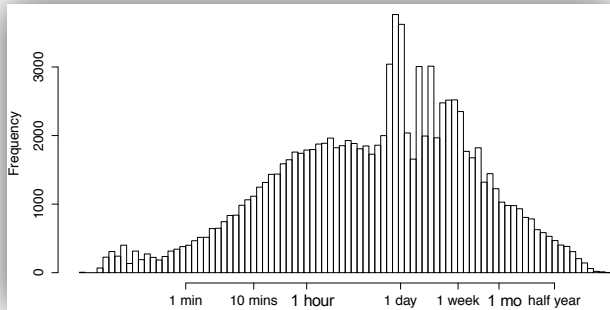
- n_tokens



Modeling the Pull Request evaluation time



M2: M1 + process-related factors
+ continuous integration



Title & description

- n_tokens



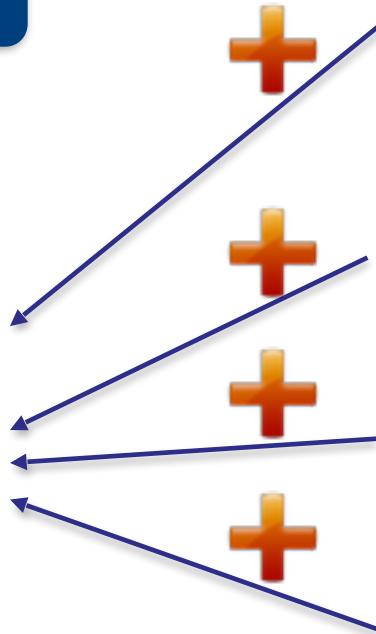
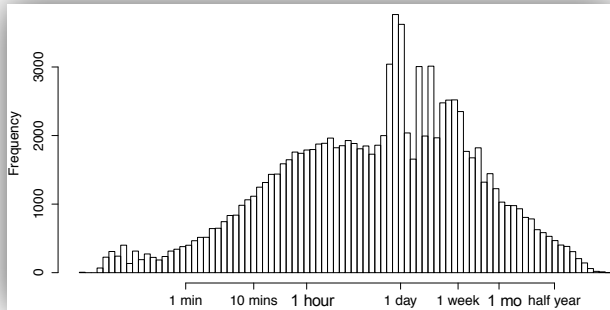
Management

- workload
- availability

Modeling the Pull Request evaluation time



M2: M1 + process-related factors
+ continuous integration



Title & description

- n_tokens



Priority

- time_to_first_response



Continuous Integration

- response time



Management

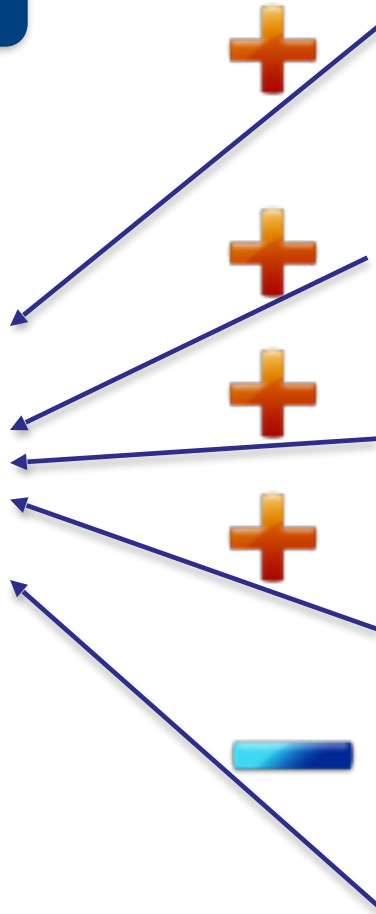
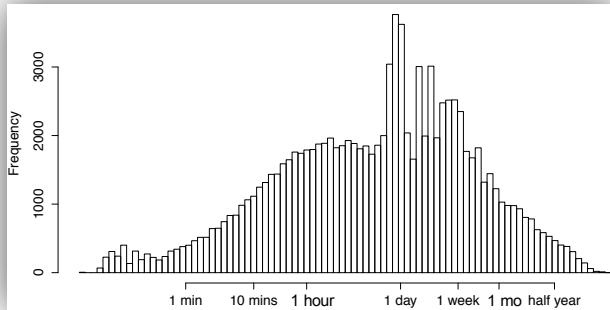
- workload
- availability

Modeling the Pull Request evaluation time



M2: M1 + process-related factors
+ continuous integration

✓ $R^2 = 58.7\%$



Title & description

- n_tokens



Priority

- time_to_first_response



Continuous Integration

- response time



Management

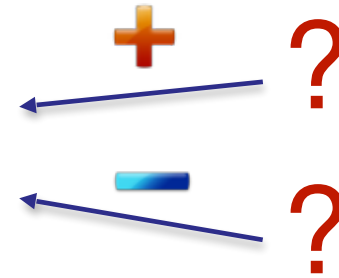
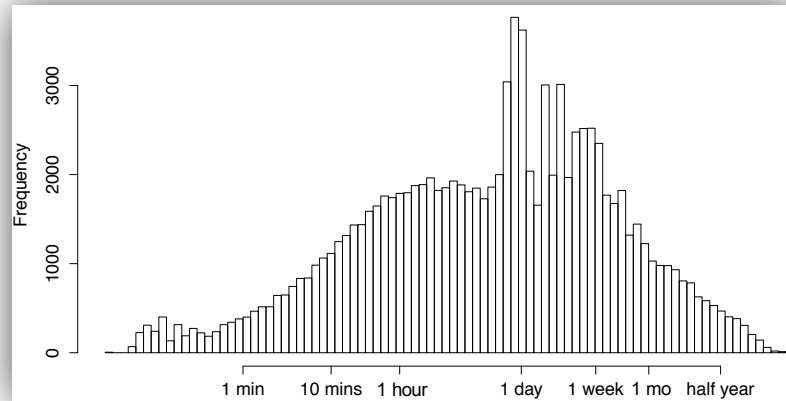
- workload
- availability



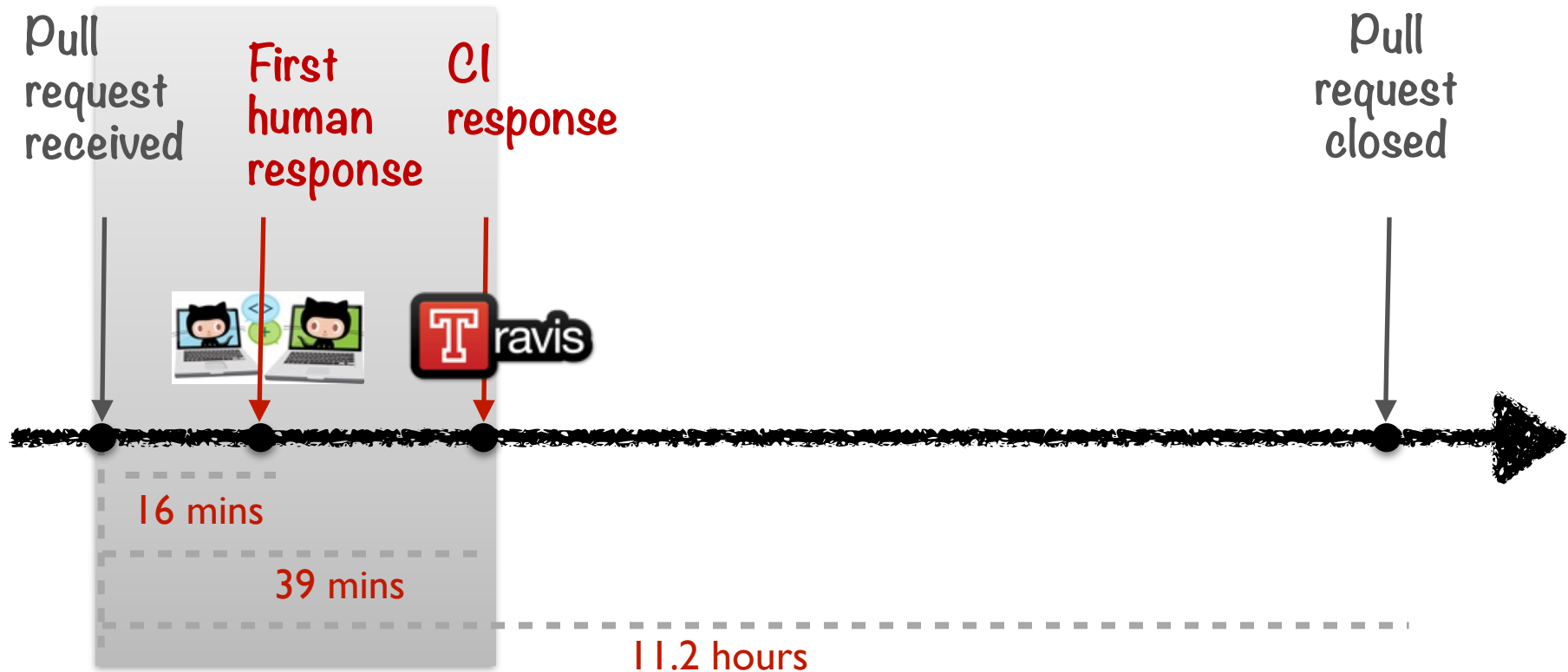
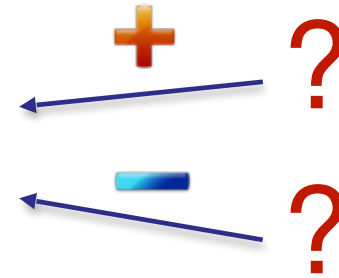
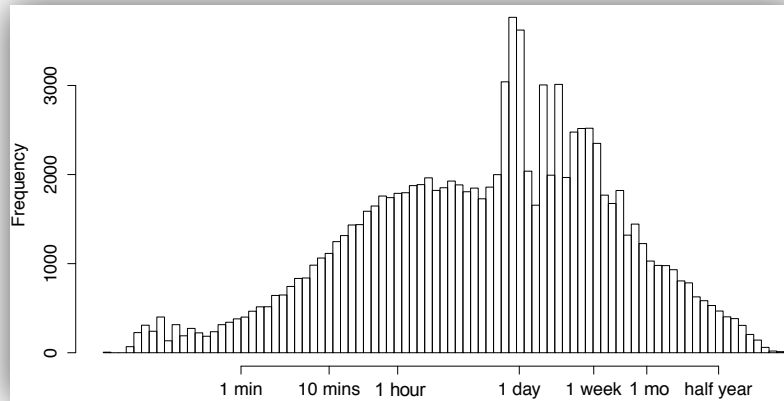
Social tagging

- @mention
- #issue

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