From Barriers To Bridges

Designing Infrastructure for Help in Online Programming Communities

Denae Ford Robinson
North Carolina State University
http://denaeford.me

What does a software engineer look like?

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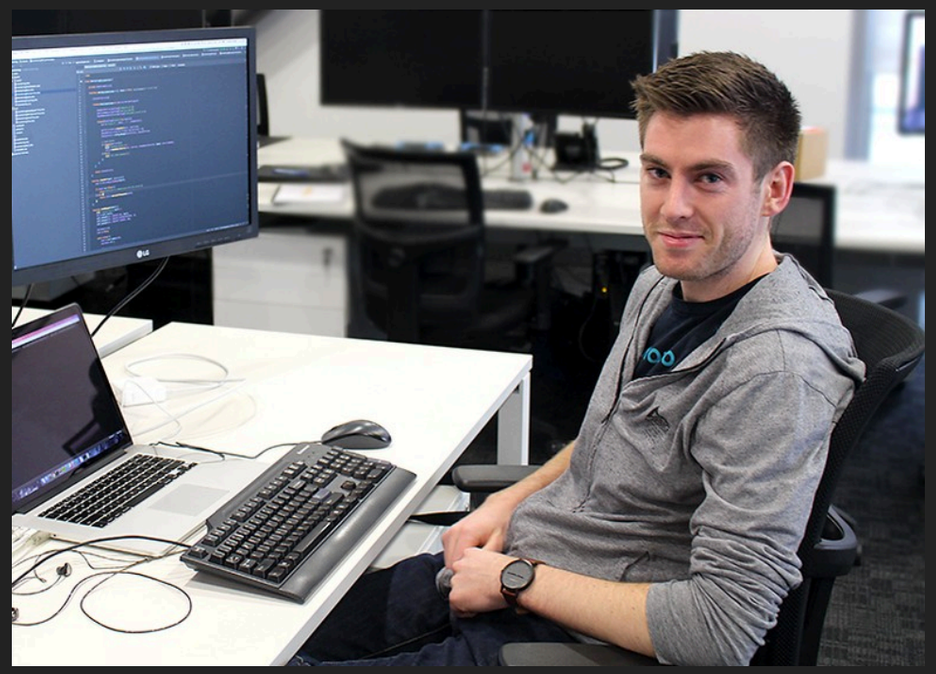

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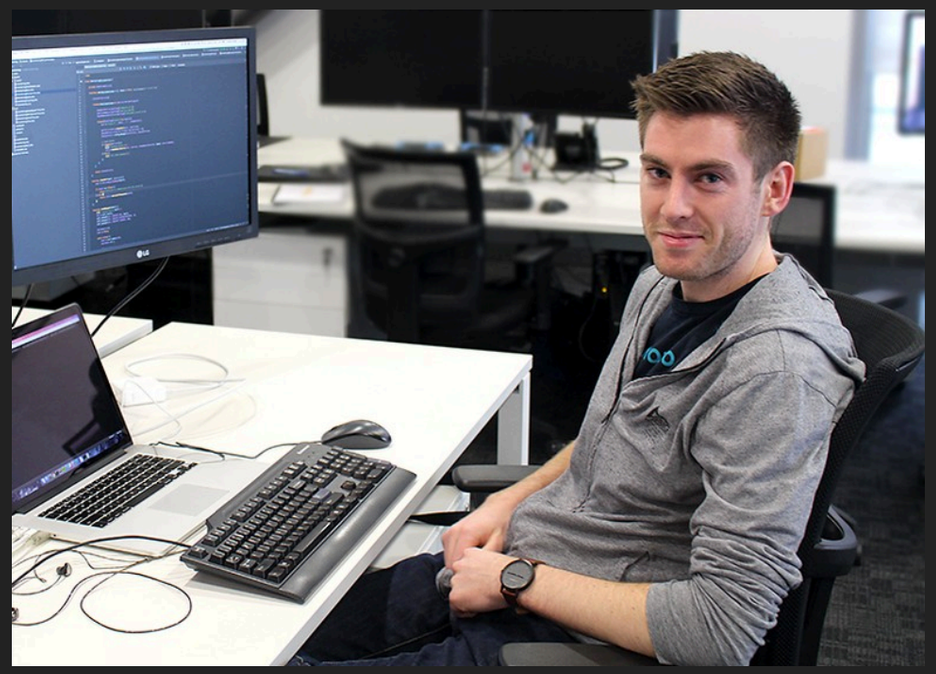

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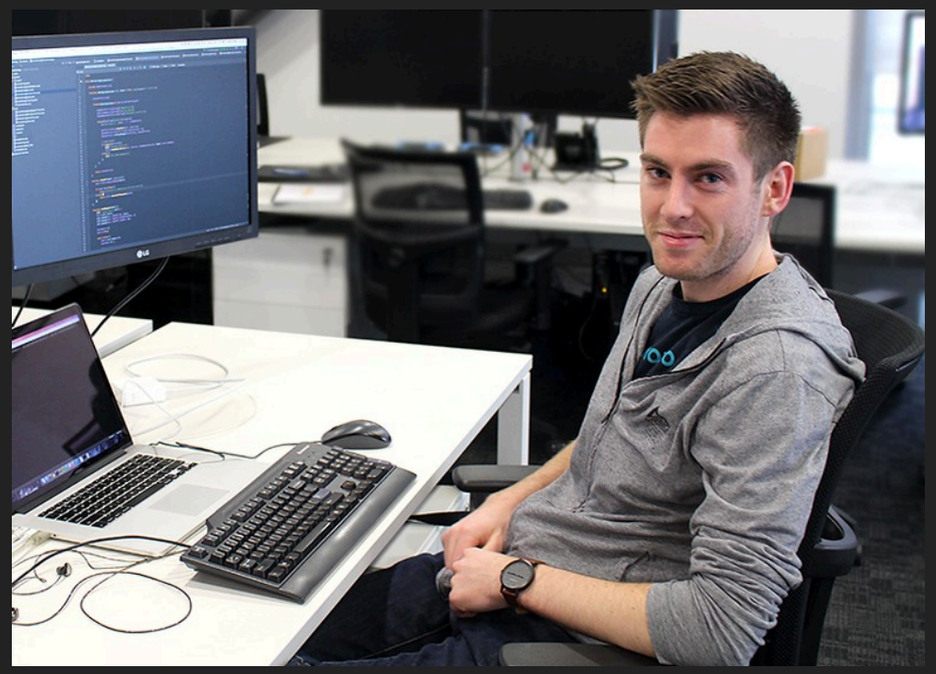

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Poll: How many of you heard of Stack Overflow?

Degree Centralization - Star graph not evaluated as 1

Ask Question

0

I'm working with a series of undirected small graphs using igraph in R. I'm interested in graph-level degree centralization, and am using the centr_degree function from igraph.

However, I noticed that even in cases of "star" graphs (one node connected to all other nodes, with no other connections), the code does not return a degree centralization of 1, though it seems from Freeman 1979 that they should. Am I missing something in how this is supposed to be calculated?

r igraph network-analysis

share edit

asked Aug 30 '16 at 20:57
Abby Jones
1

asked 12 months ago
viewed 196 times
active 12 months ago

BLOG
A Tale of Two Industries: How Programming Languages Differ Between Wealthy…
FEATURED ON META
Sunsetting Documentation
Should we burninate the [entry] tag?
Documentation is read-only. What's next?

1 Answer

active oldest votes

1

I think the actual problem may be an off-by-one error for the theoretical max. Calculating it manually gives you 3 * 4 = 12, which agrees with use of centralize(normalize=FALSE), but the R output from centralization.degree seems to be 4 * 5 = 20. To solve your problem I'd suggest using the following code to normalize it yourself.

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> newCentralization = function(h) centralize(degree(h),normalize=FALSE)/((vcount(h)-1)*(vcou
> newCentralization(h)
[1] 1

> sessionInfo()
    attached base packages:
[1] stats     graphics  grDevices utils     datasets  methods   base:
[1] igraph_1.0.1
```

share edit

answered Sep 2 '16 at 5:18
Patricia Jones
26 • 2

Thanks so much Patricia! – Abby Jones Sep 7 '16 at 17:06

[Burnett et al., 2016]

Linked

1935 How to make a great R reproducible example?

Related

3 Sort and subset neighbors by edge property in R using igraph

5 Changing node/vertice opacity in iGraph in R

5 Using geo-coordinates as vertex coordinates in the igraph r-package

0 r and igraph Help, Assortativity Coefficient with Weighted Edges, Remaining weights

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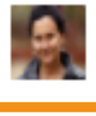
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[Burnett et al., 2016]

MOTIVATING EXAMPLE

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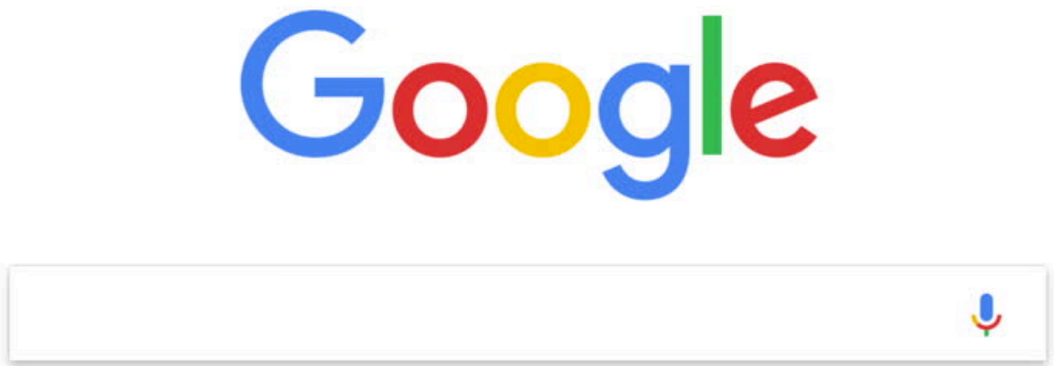
Asha, The Programmer

MOTIVATING EXAMPLE



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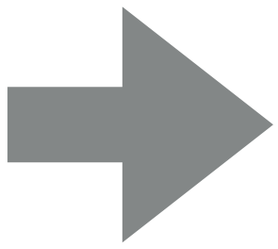

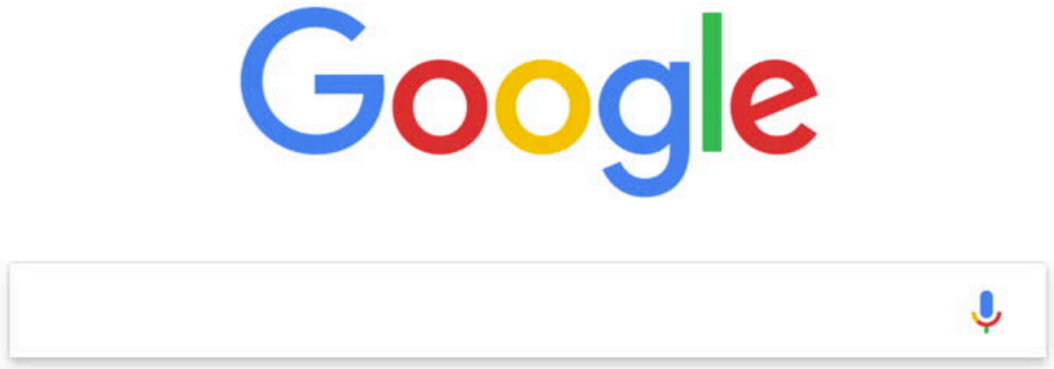

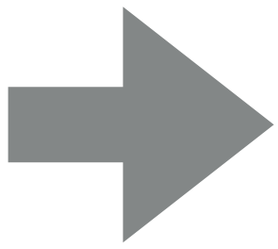

MOTIVATING EXAMPLE

MOTIVATING EXAMPLE

1 Answer

active oldest votes

7

I think the only way to import only a single type from a module is to use type alias (as you already noted). To get a qualified access to members of the module (under a different name), you can use module alias:

```
type Item = Item.Item // Type-alias for type(s) from module
module I = Item       // Module-alias for accessing members

// Now you can write:
let getItem() : Item = I.empty
```

I don't think there is any way for importing members from module selectively (as in Haskell), so this is probably the best option.

share edit

answered Jul 1 '10 at 10:04

Tomas Petricek
151k ● 9 ● 173 ● 335

MOTIVATING EXAMPLE

Questions Developer Jobs Tags Users Search...

Title Why aren't my arrays showing updates?

Questions that may already have your answer

0	Why aren't my icons showing?
0	Why aren't my rectangles showing? 1
0	IF… Else + JOption, Why aren't my JOptionPanes showing? 2
1	Why Aren't My Cards Random? 3
-3	Why aren't my divs showing up? [closed] 2
0	Why aren't my validation messages showing? 1

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I am having a problem with getting this code to work.

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    print("here is some sample code!")
    };

Thank you.
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WHAT HAPPENED?

Questions Developer Jobs Tags Users Search...

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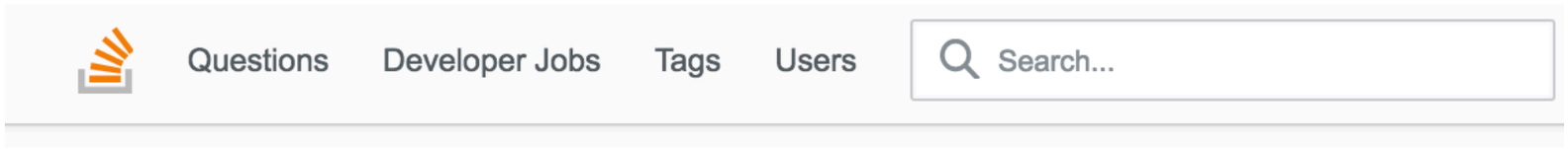


1. did not see other users who look like her post questions

edited Jan 3 at 17:17

Md. Abu Nafee Ibna Zahid

189 ● 2 ● 11

asked Jan 3 '09 at 20:39

Alex Spurling

17.5k ● 18 ● 46 ● 58

WHAT HAPPENED?

Questions Developer Jobs Tags Users Search...

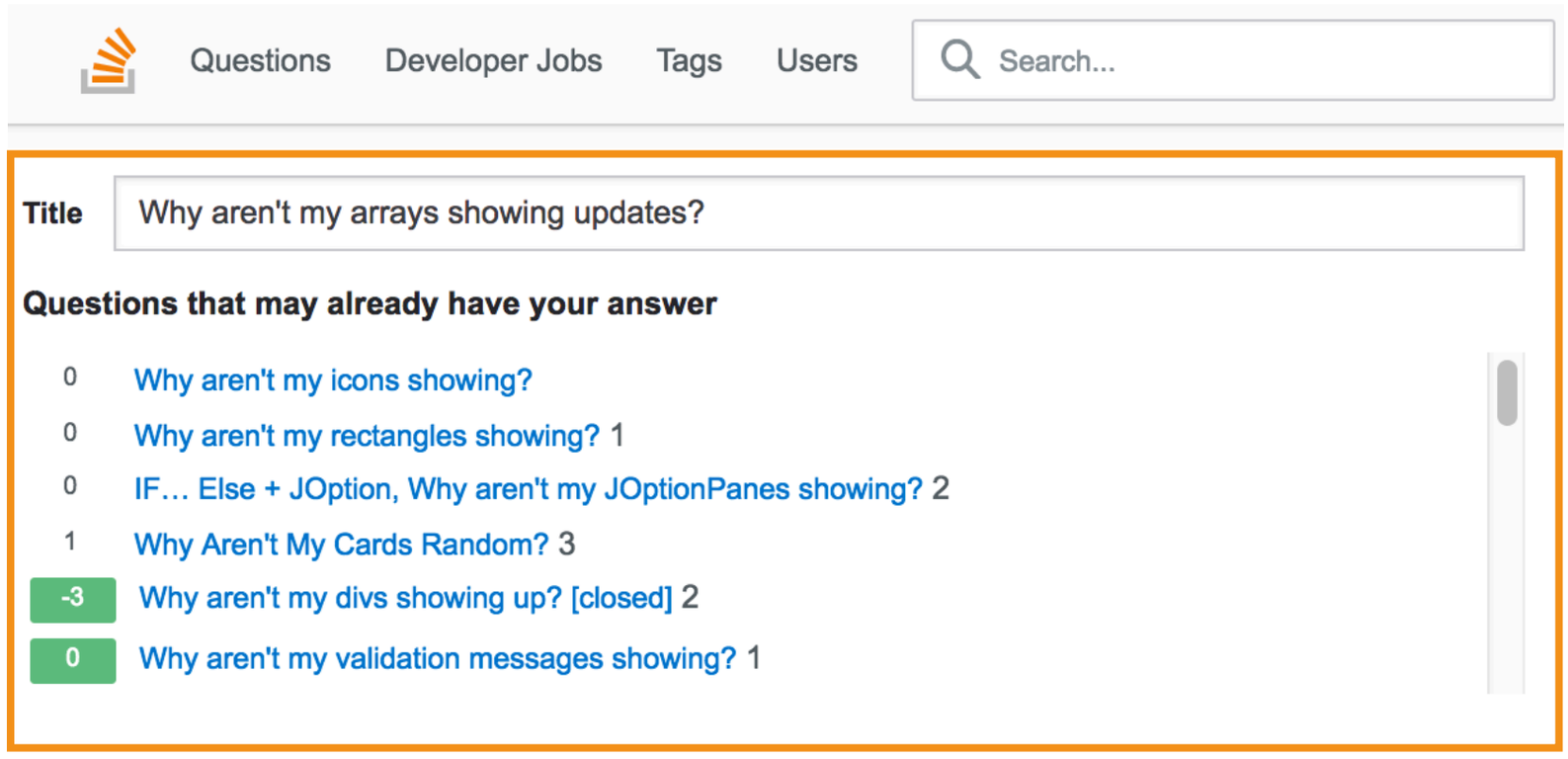
1. did not see other users who look like her post questions

2. unfamiliar with community expectations and feels her question is unfit

protected by Aniket Thakur Oct 2 '15 at 18:54

This question is protected to prevent "thanks!", "me too!", or spam answers by new users. To answer it, you must have earned at least 10 reputation on this site (the association bonus does not count).

WHAT HAPPENED?



3. question may be a duplicate since list of existing questions appear

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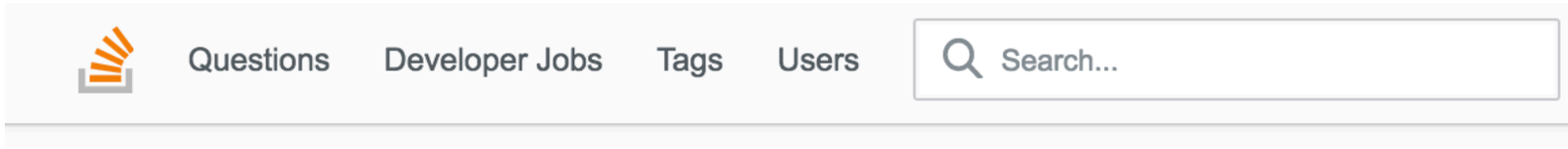

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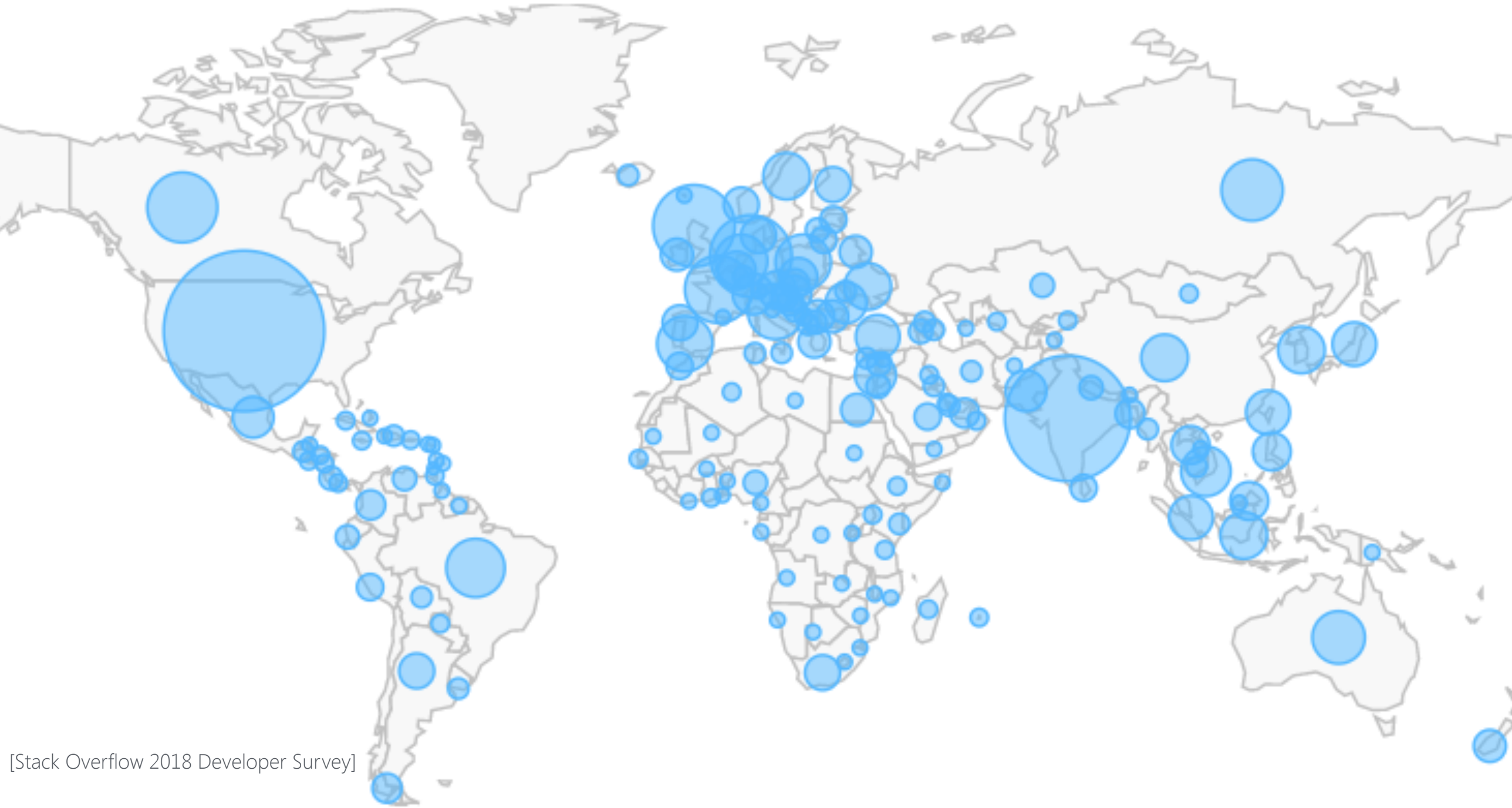
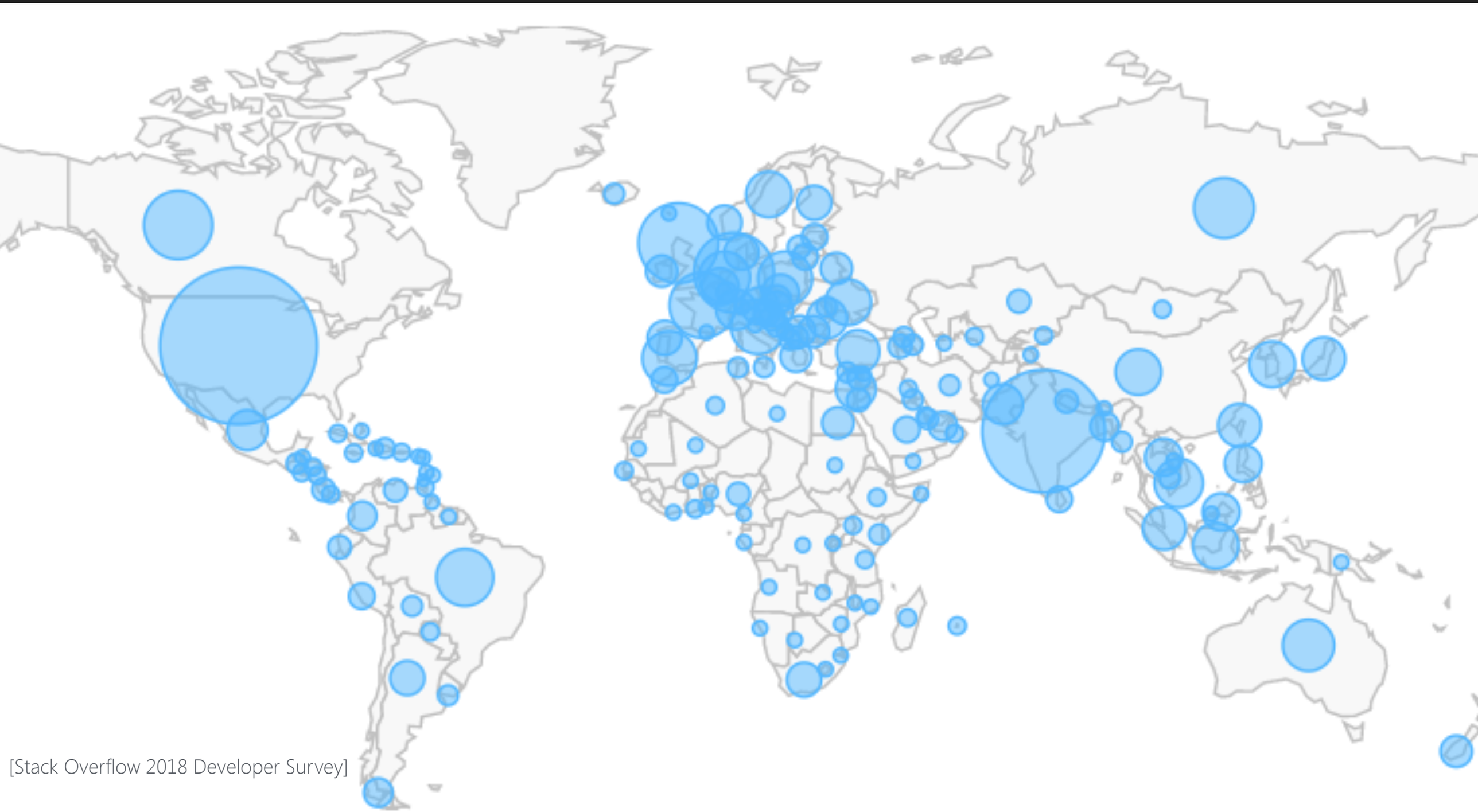


[Stack Overflow 2018 Developer Survey]

WHILE 50 MILLION PEOPLE VISIT STACK OVERFLOW MONTHLY



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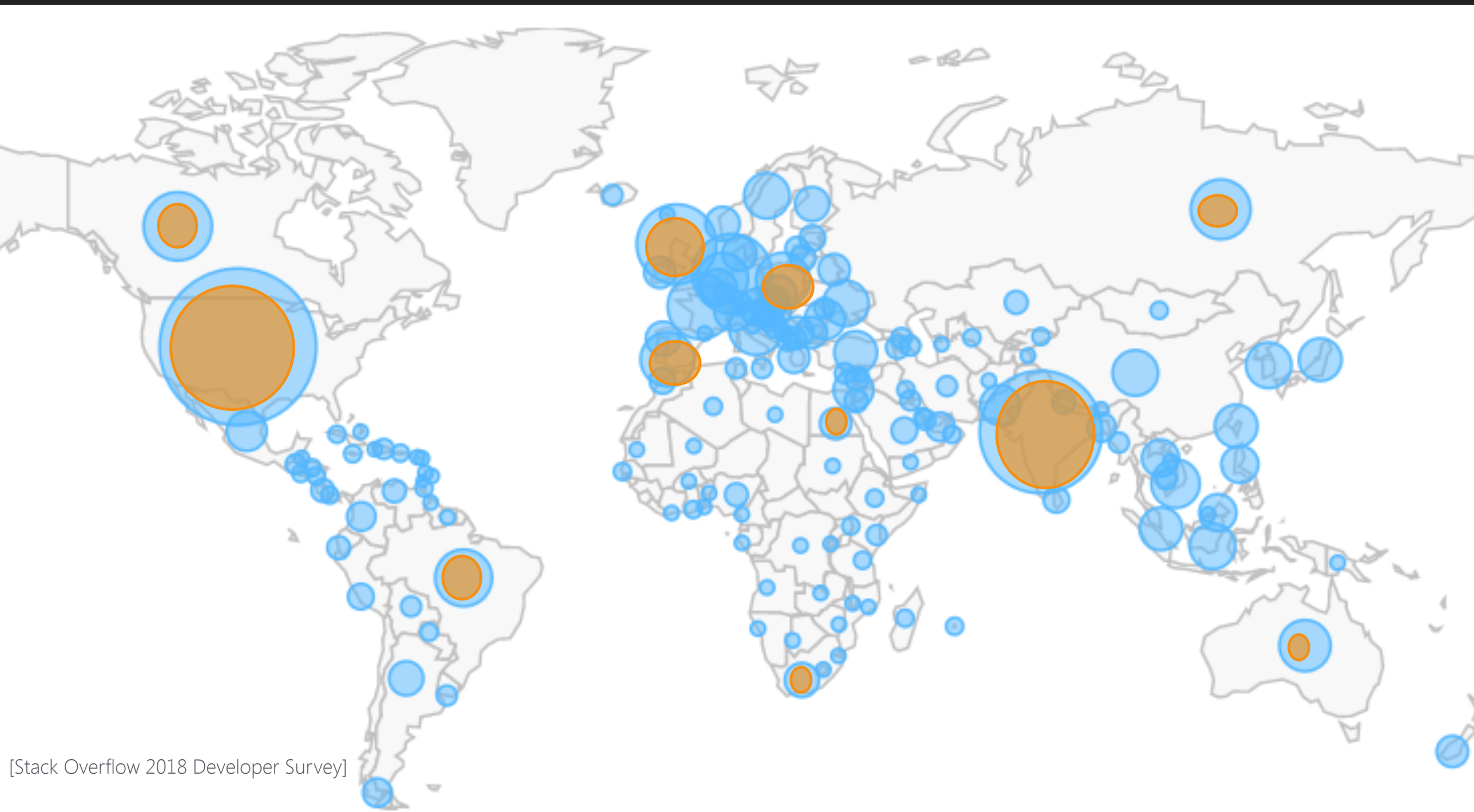
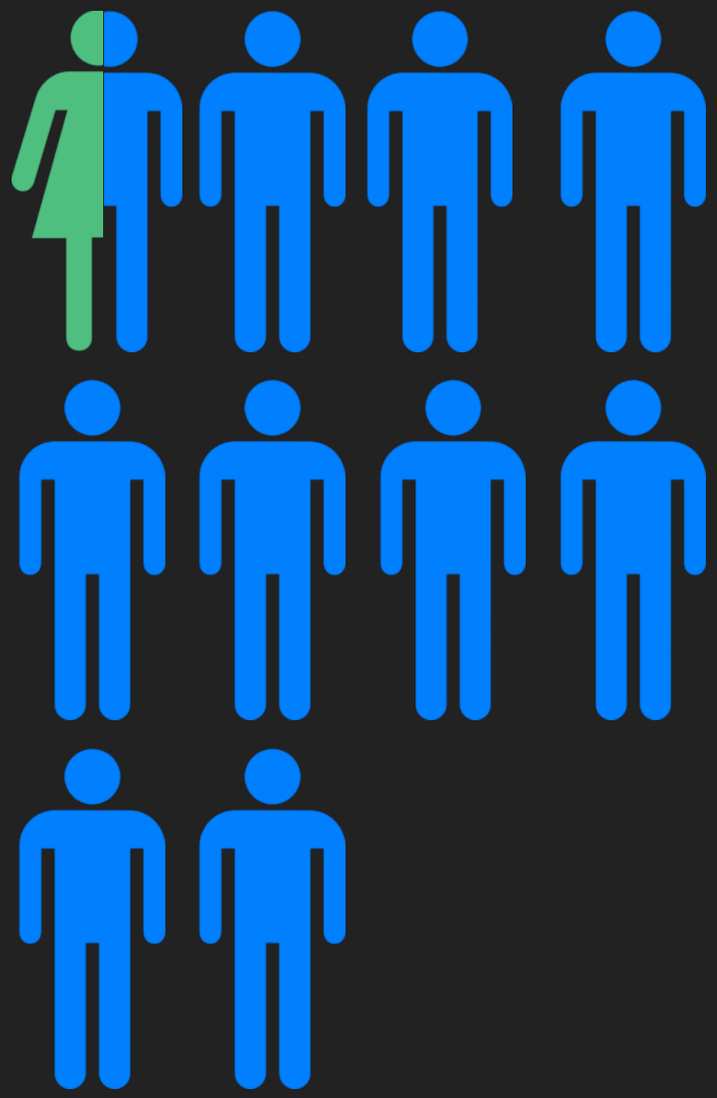
WHILE 50 MILLION PEOPLE VISIT STACK OVERFLOW MONTHLY
ONLY 10 MILLION HAVE ACCOUNTS



[Stack Overflow 2018 Developer Survey]

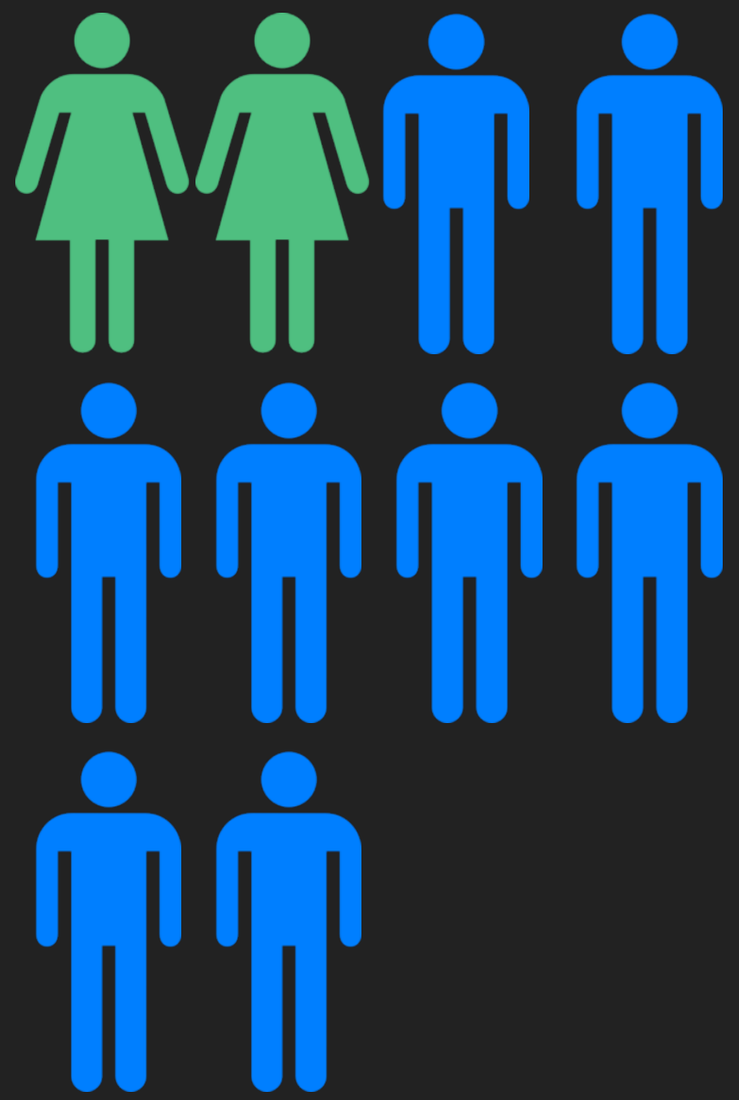
LESS THAN 7% WOMEN IN OPEN SOURCE

Open Source Communities



7% **vs.** 20%

Software Engineers

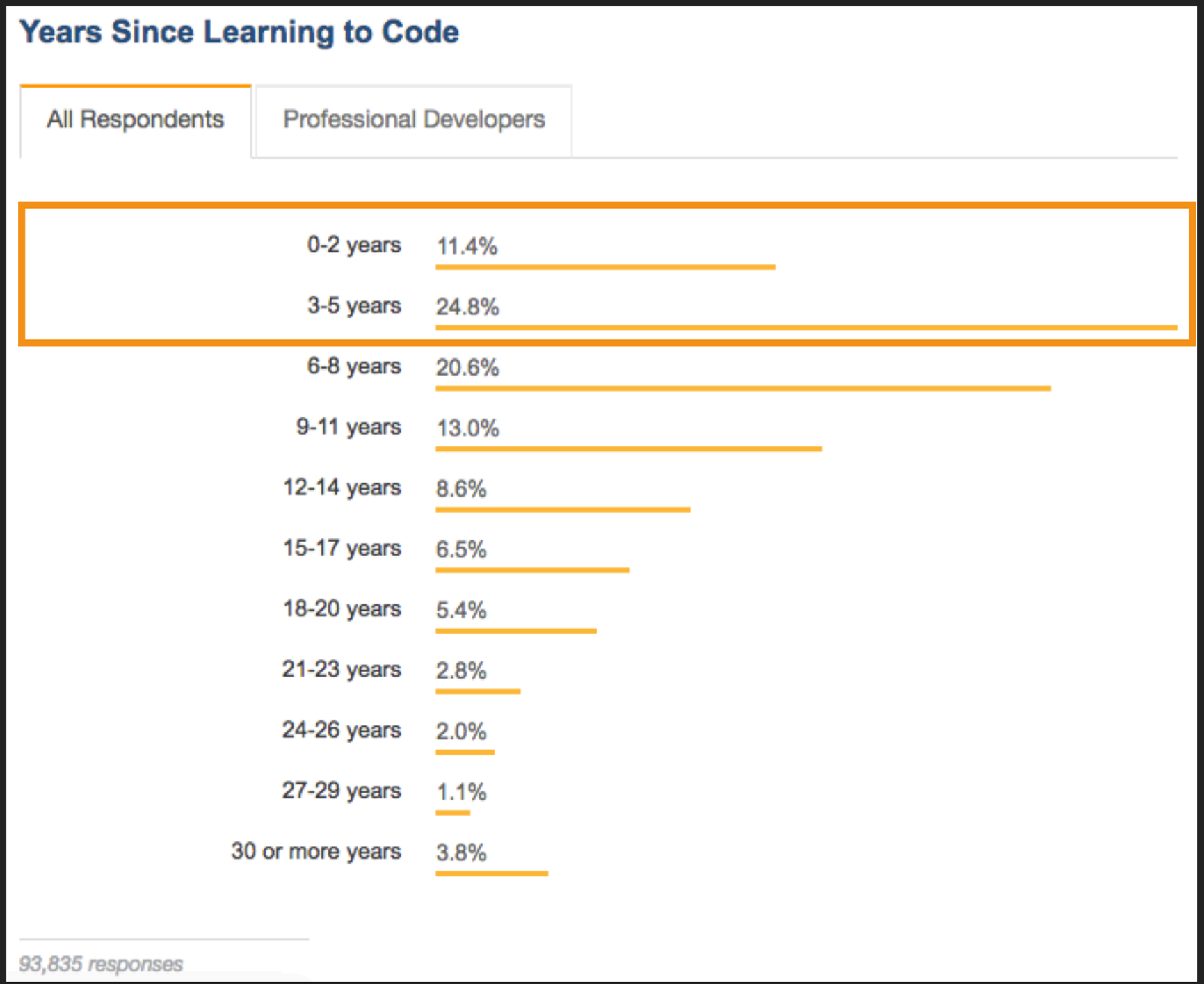


[David 2008] [Zlotnick 2017]
[SO Developer Survey 2018]

[USBLS 2016]

1/3 OF USERS HAVE <=5 YEARS EXPERIENCE

Many users are new



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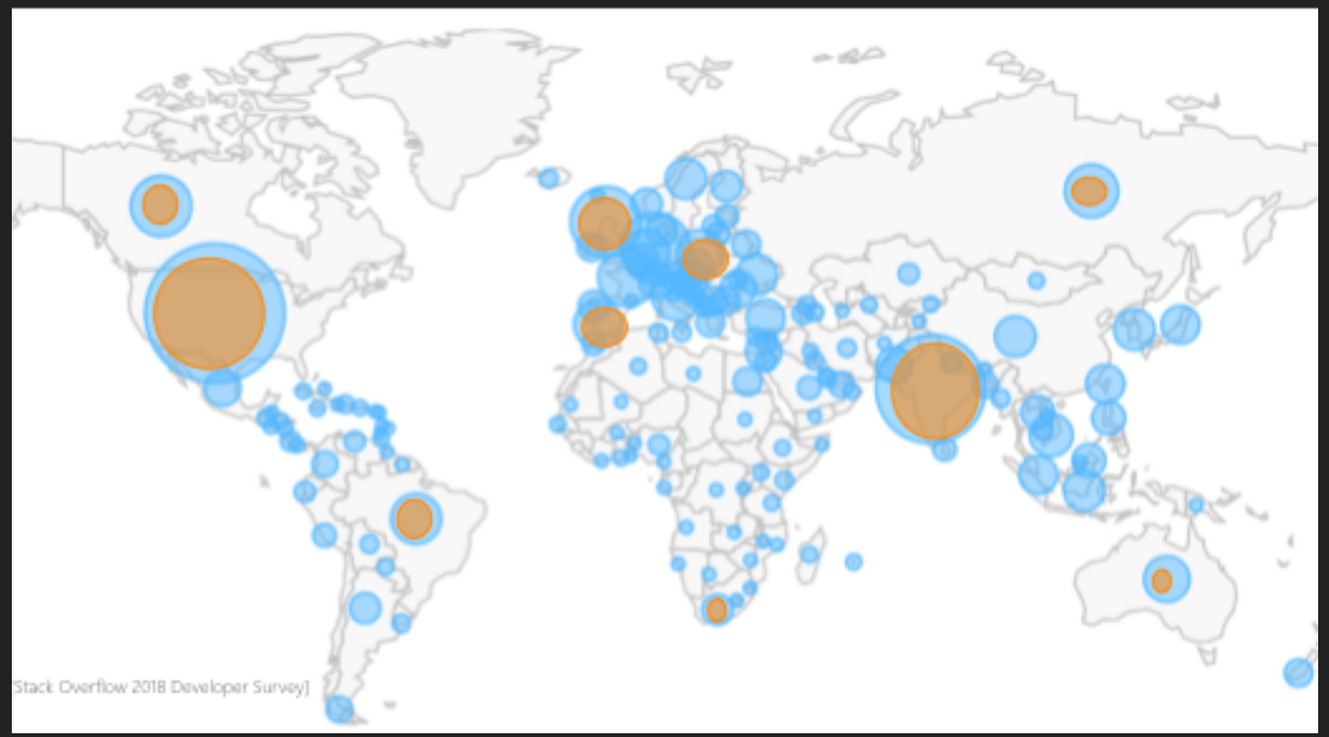

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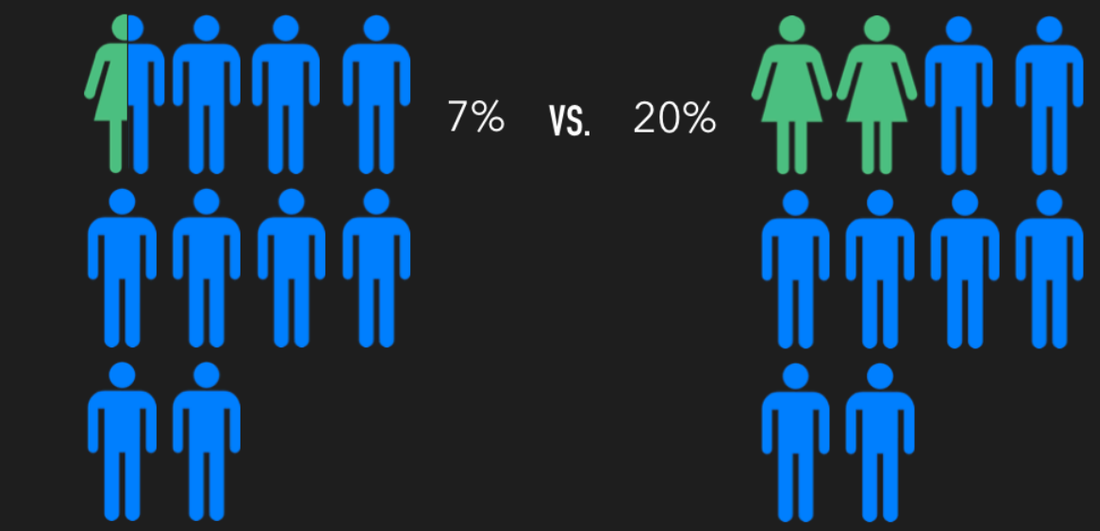

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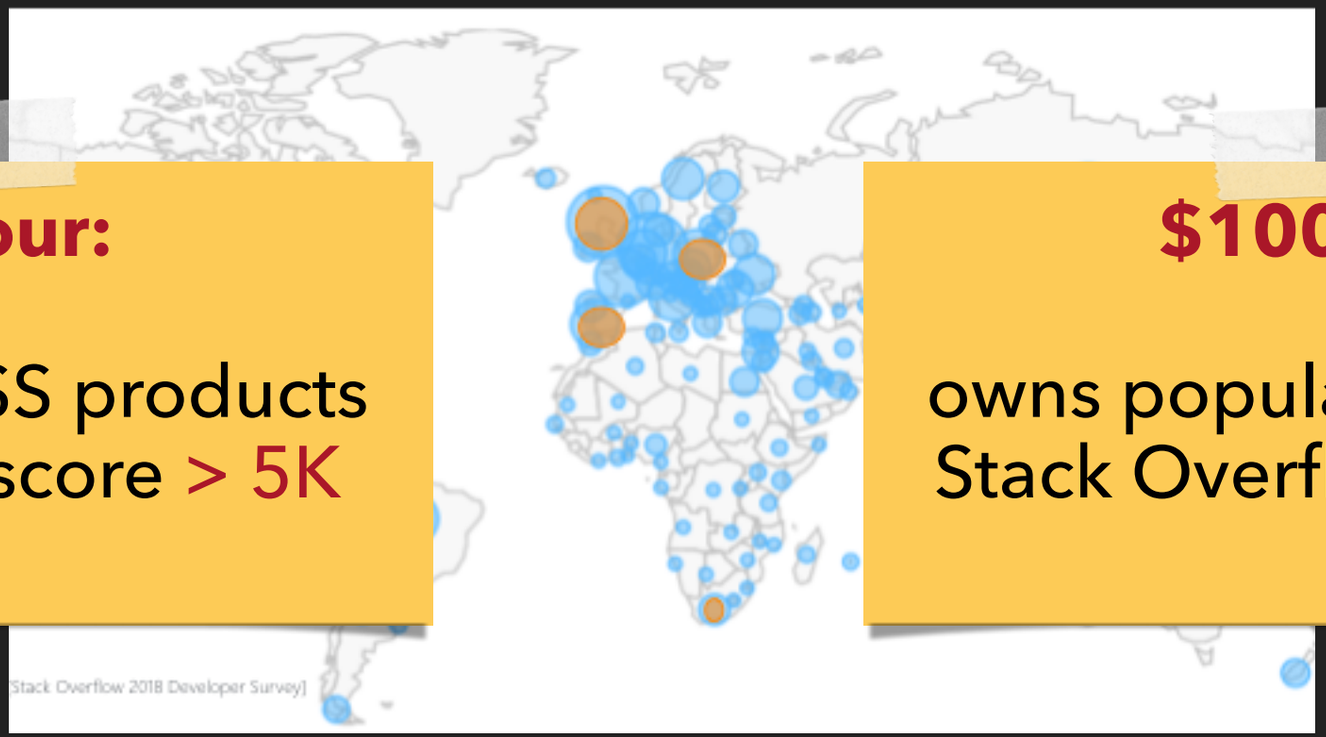


$50+ /hour:

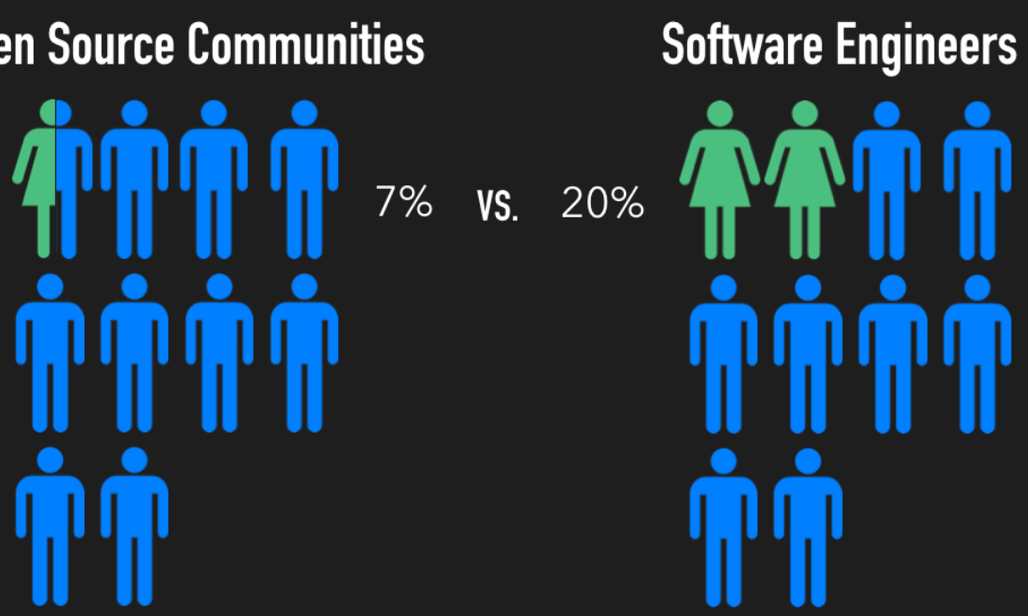
owns popular OSS products
Stack Overflow score > 5K

$100+ /hour:

owns popular OSS products
Stack Overflow score > 20K

[Bugayenko, 2014]

LESS THAN 7% WOMEN IN OPEN SOURCE



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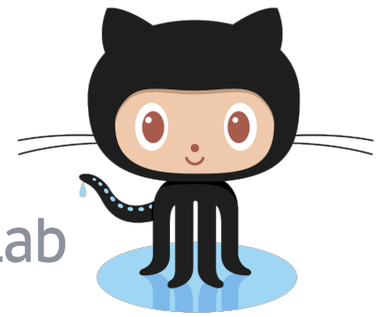
Many users are new

PROBLEM

Programmers, especially underrepresented groups and novices, encounter challenges when interested in participating in online programming communities.



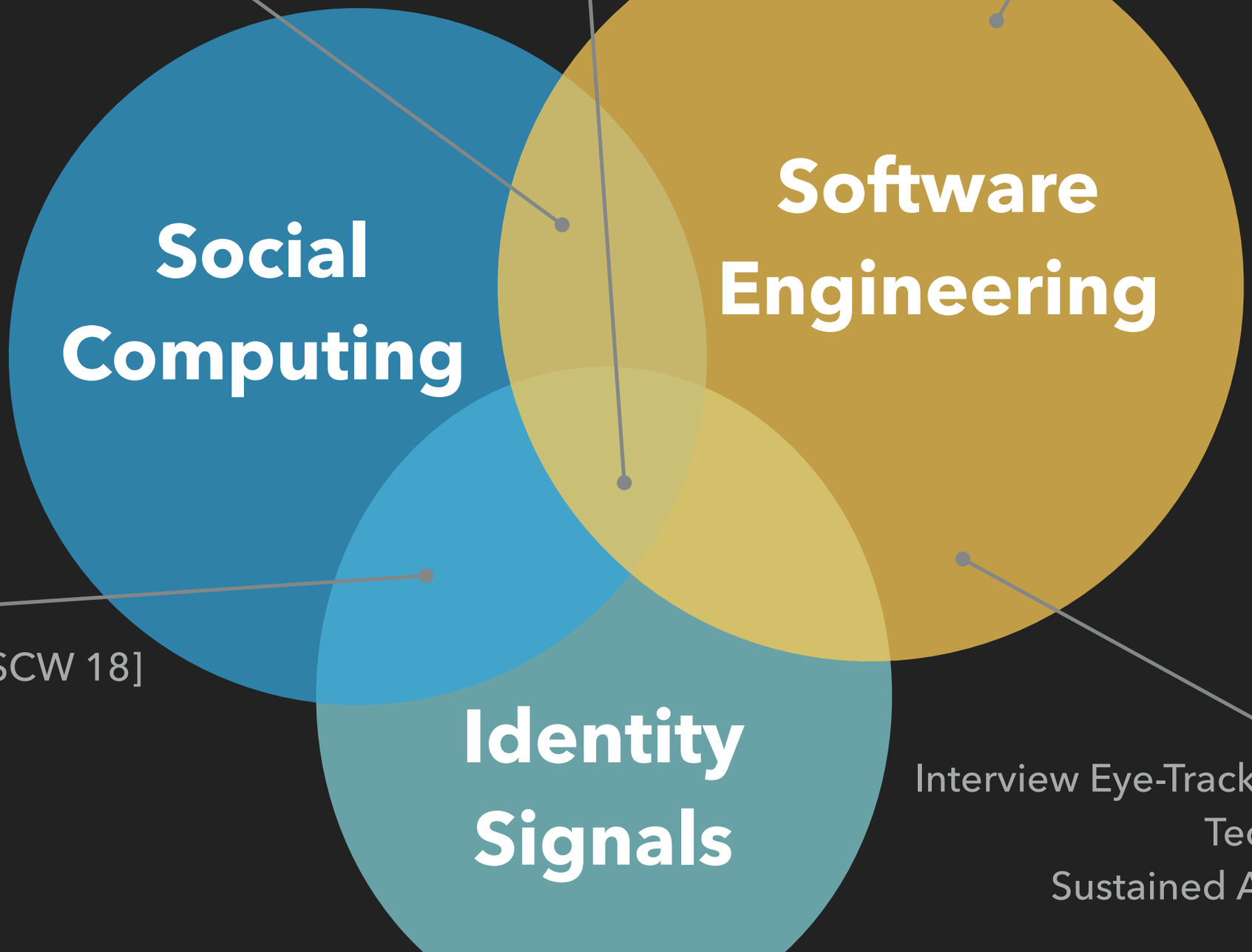
[Vasilescu 2013, Steinmacher 2015, Filippova 2015, Stack Overflow 2017]

RESEARCH AREA

SO Mentorship [CHI 18]
SO Compiler Errors [FSE 18]
SO Barriers [FSE 16]
Frustrated Devs [CHASE 15]

GH Signals [ICSE SEIS 19]
Peer Parity [VLHCC 17]

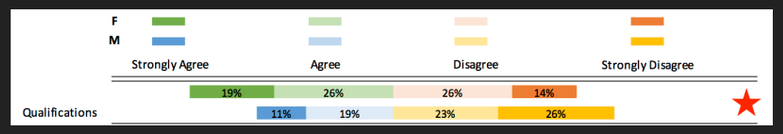
Characterizing Devs [ESEM 17]
Tool Notifications [FSE 16]



Identity
Movements [CSCW 18]

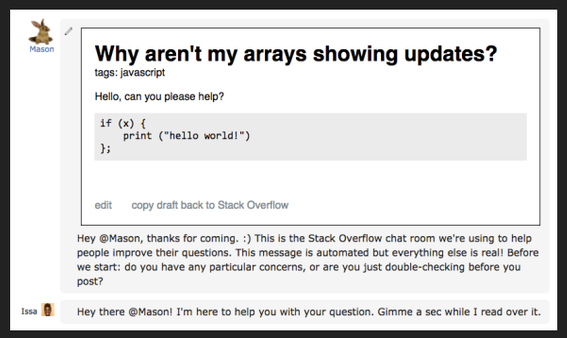
Interview Eye-Tracking [ICSE NIER 18]
Tech Talk [CHASE 17]
Sustained Attention [EMIP 15]

TODAY



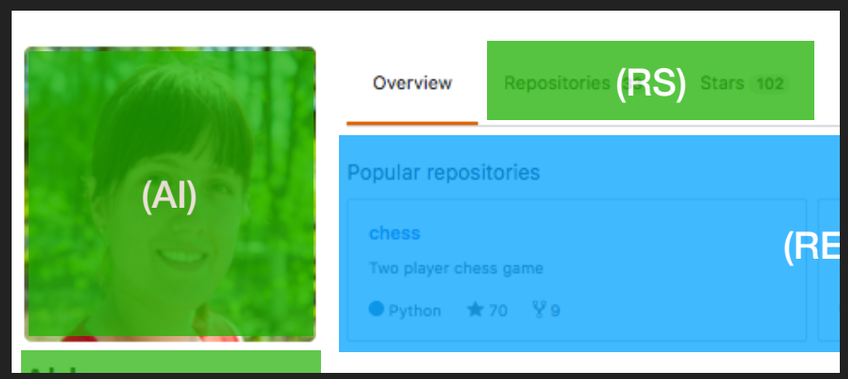
Barriers to Participation

[**Ford**, Smith, Guo, Parnin. FSE 2016]



Mentorship

[**Ford**, Lustig, Banks, Parnin. CHI 2018]



Vision

The Future of Asking

RESEARCH QUESTIONS

RQ1 What barriers do women face on Stack Overflow?

RQ2 How do barriers vary by gender?

RQ3 How do barriers manifest across usage and experience?

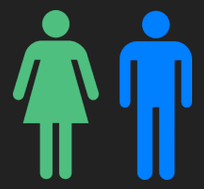
EXPERIMENT

MIXED METHODS

RQ1

Interviews

RQ2



Surveys

EXPERIMENT

SEMI-STRUCTURED INTERVIEWS

Emailed ‘Women in Computer Science’ Lists

22 Responses

EXPERIMENT

SEMI-STRUCTURED INTERVIEWS

Emailed ‘Women in Computer Science’ Lists

22 Responses

1 of 22 in “SO Top 100 of All Time”*

Demographics

- Students
- Professionals
- Lurkers
- Active Users

*http://stackexchange.com/leagues/1/alltime/stackoverflow

EXPERIMENT

SEMI-STRUCTURED INTERVIEWS

Emailed 'Women in Computer Science' Lists

22 Responses

1 of 22 in "SO Top 100 of All Time"*

Demographics

Students

Professionals

Lurkers

Active Users

Interview Topics

Personal usage of the site

How people communicate on the site

Personal incentives to using the site

Response to potential scenarios on the site

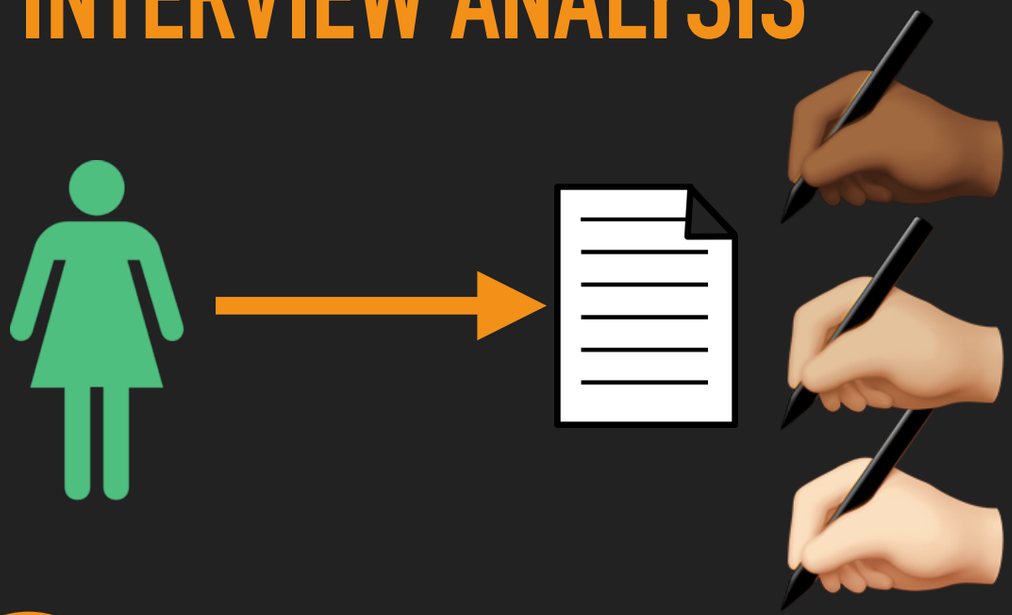
*http://stackexchange.com/leagues/1/alltime/stackoverflow

EXPERIMENT

INTERVIEW ANALYSIS

EXPERIMENT

INTERVIEW ANALYSIS



Barrier Statement Examples

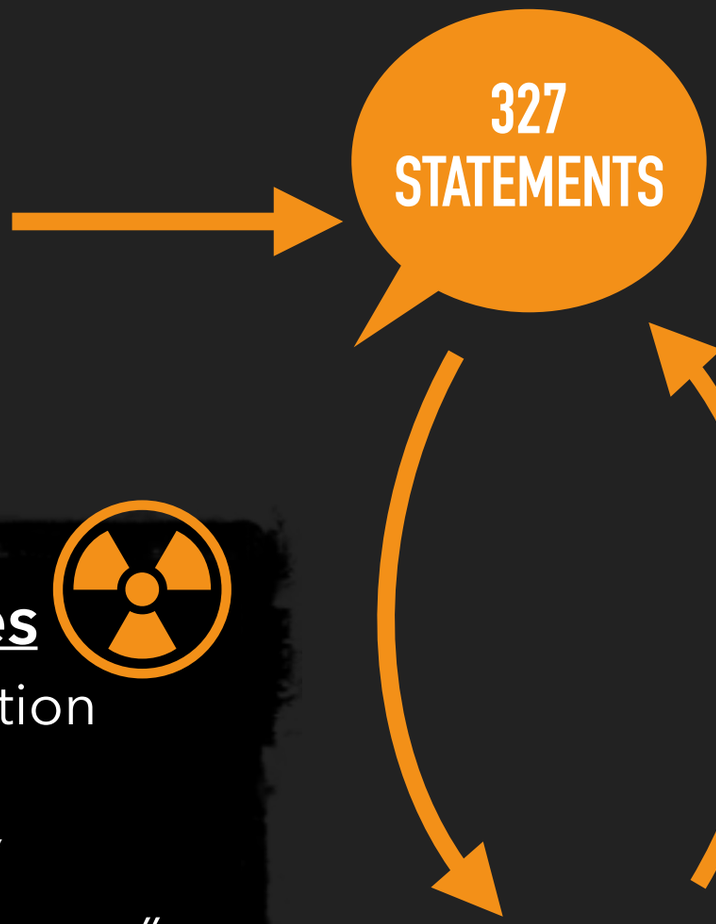
Any mechanism imposing participation

"….don't contribute because…."

"… don't post on Stack Overflow because…"

EXPERIMENT

INTERVIEW ANALYSIS



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P: I'm only looking for stuff that I really don't understand myself. I don't feel like my expertise ... for me to actually post an answer that would be of any help to anyone else.3:07

Justin
#B.8 Doesn't feel like an expert or qualified to help others.

Denae
#B.8 Doesn't feel like her expertise is high enough to help others.

EXPERIMENT

INTERVIEW ANALYSIS

Barrier Statement Examples

Any mechanism imposing participation

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P: I'm only looking for stuff that I really don't understand myself. I don't feel like my expertise ... for me to actually post an answer that would be of any help to anyone else.3:07

Justin
#B.8 Doesn't feel like an expert or qualified to help others.

Denae
#B.8 Doesn't feel like her expertise is high enough to help others.

RESULTS

QUALIFICATIONS

"I don't feel like my expertise [is enough] for me to actually post an answer that would be of any help to anyone else."

RESULTS

QUALIFICATIONS

"I don't feel like my expertis[illegible]ough] for me to actually post[illegible]er that would be of any he[illegible]yone else."

IMPOSTER SYNDROME

RESULTS

ONBOARDING HOOPS

"I feel like everyone else already knows what it is. And [I] want to stay away from that extra work to figure out how to use it. Just figuring out what the etiquette is, all the little social things too that are kind of unspoken"

RESULTS

ONBOARDING HOOPS

"I feel like everyone else already knows what it is. And [I] want to stay away from that extra work to figure out how to use it. Just figuring out the etiquette is, all the little things too that are kind of [illegible]"

UNFAMILIAR NORMS

RESULTS

FEAR OF NEGATIVE FEEDBACK

"It's hard enough to ask for help, then to ask for help and get rude help. You are kind of like, 'never mind'."

RESULTS

FEAR OF NEGATIVE FEEDBACK

"It's hard enough to ask for [illegible]en to ask for help and get rud[illegible]ou are kind of like, 'never

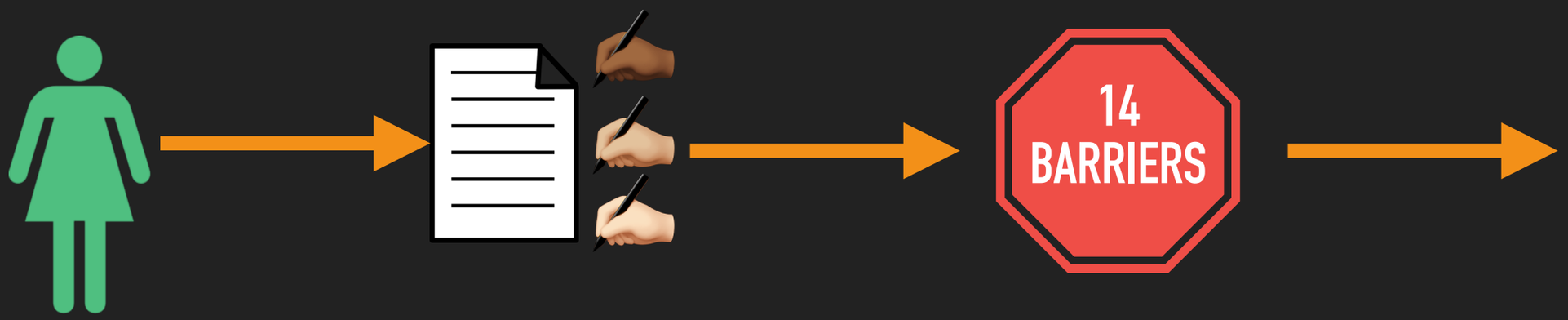
CONFLICT AVOIDANCE

RESEARCH QUESTIONS

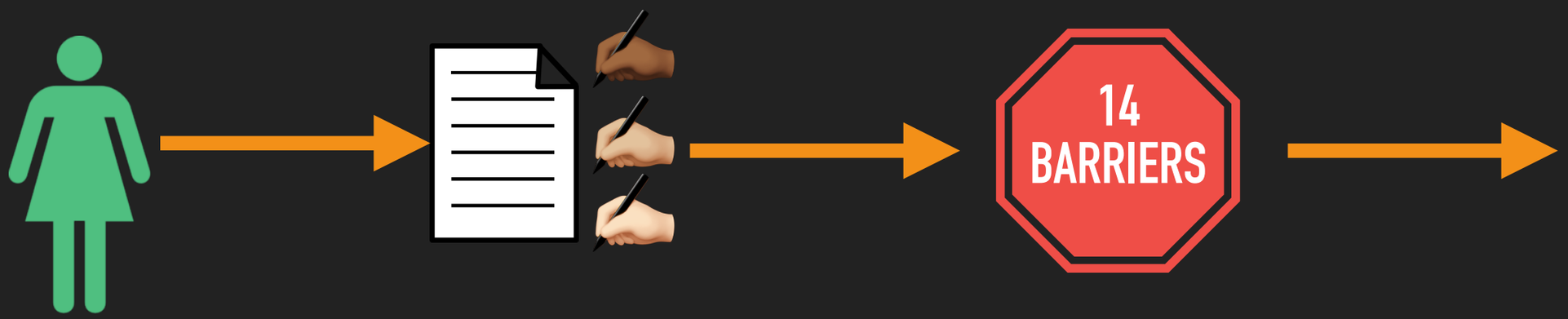
RQ1 What barriers do women face on Stack Overflow?

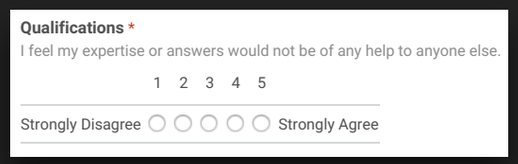
RQ2 How do barriers vary by gender?

EXPERIMENT


14
BARRIERS
Qualifications *
I feel my expertise or answers would not be of any help to anyone else.
1 2 3 4 5
Strongly Disagree
Strongly Agree

EXPERIMENT


14
BARRIERS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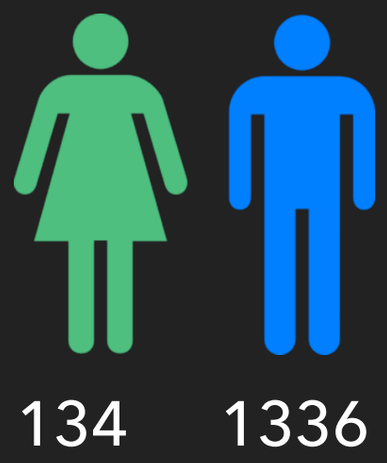
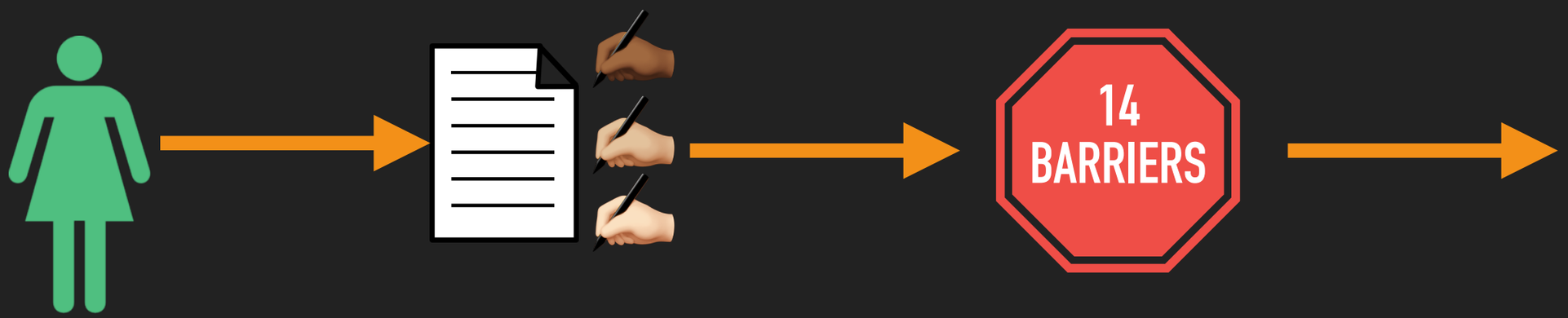
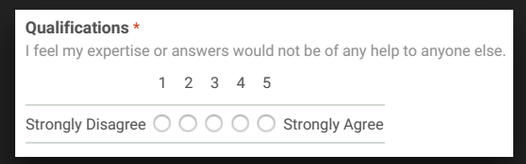

134
1336

EXPERIMENT



14
BARRIERS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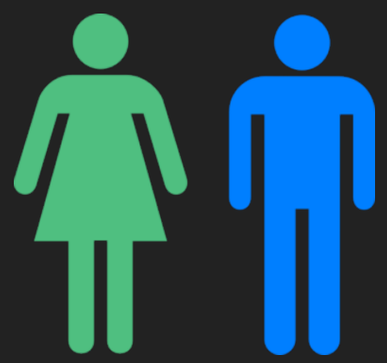
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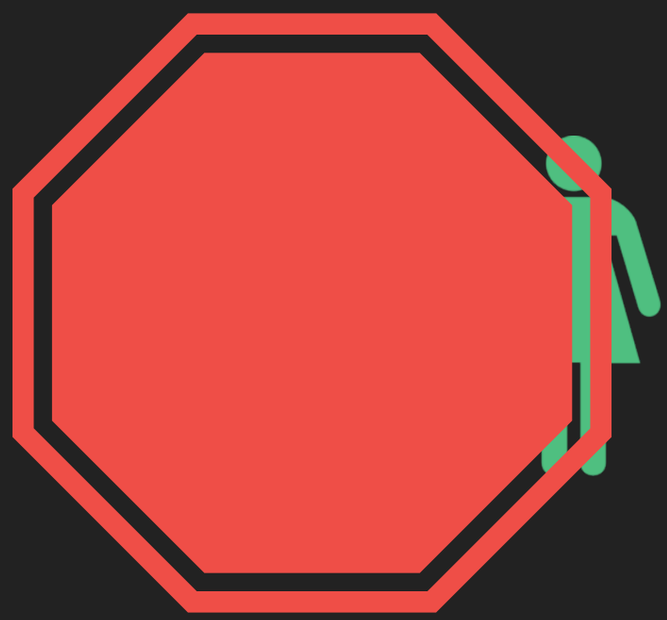
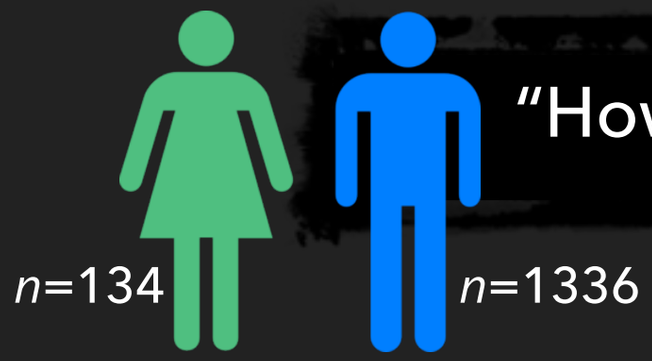


RESULTS



"How often is this a barrier for you?"

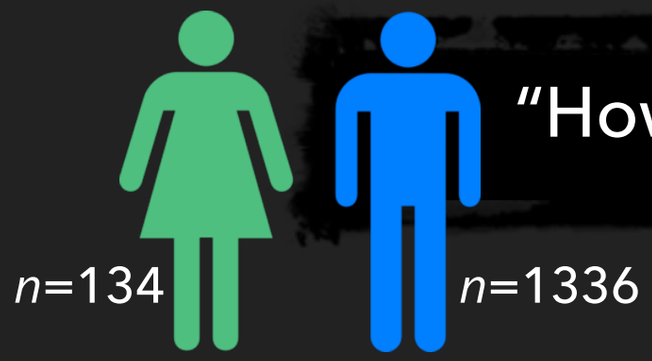
WILCOXON RANK SUM TEST

α = .05; α = 0.0012 with Bonferroni Correction

Barrier	*p*-value	SigDiff	Effect Size	Women Likert	Men Likert
Intimidating Community Size	<0.001	★	0.5		
Awareness of Features	<0.001	★	0.5		
Stranger Discomfort	<0.001	★	0.4		
Qualifications	<0.001	★	0.4		
Perception Of Slacking	0.001	★	0.4		
Fear of Negative Feedback	0.003		0.4		

[FSE 2016]

RESULTS



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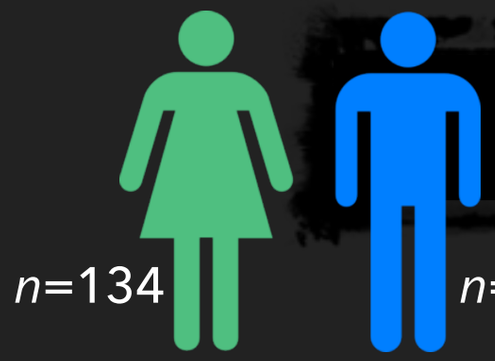
[FSE 2016]

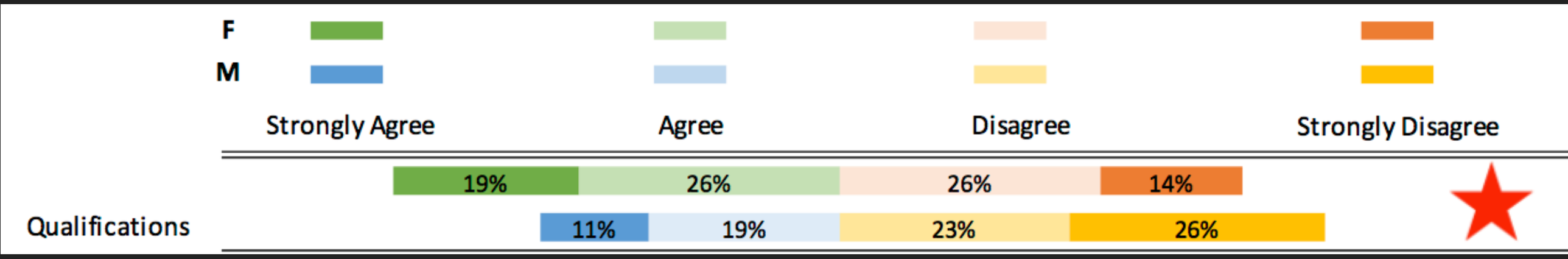
RESULTS

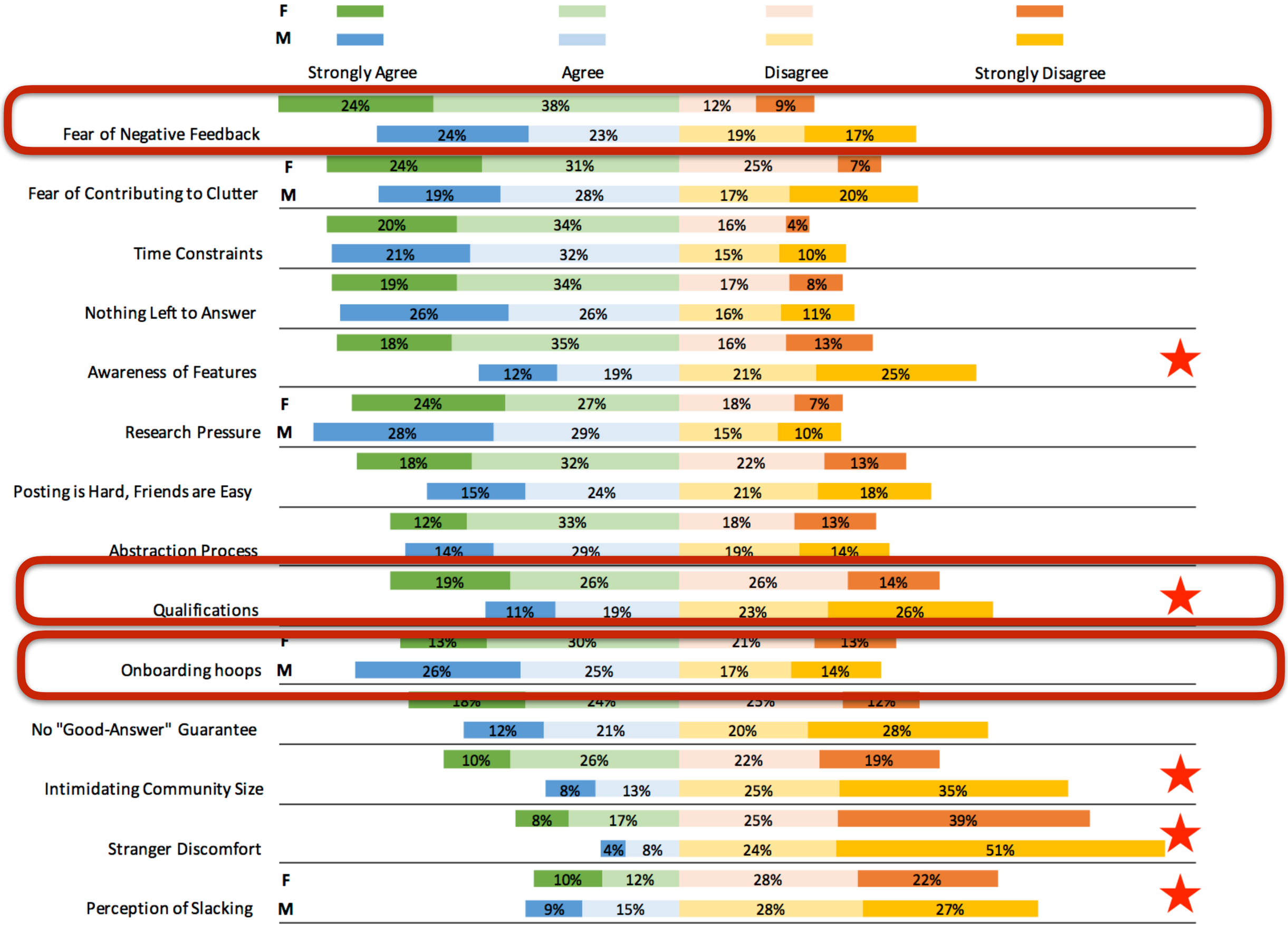


n=134

n=1336

"How often is this a barrier for you?"




F
M
Strongly Agree
Agree
Disagree
Strongly Disagree
Fear of Negative Feedback
24% 38% 12% 9%
24% 23% 19% 17%
Fear of Contributing to Clutter
F 24% 31% 25% 7%
M 19% 28% 17% 20%
Time Constraints
20% 34% 16% 4%
21% 32% 15% 10%
Nothing Left to Answer
19% 34% 17% 8%
26% 26% 16% 11%
Awareness of Features
18% 35% 16% 13%
12% 19% 21% 25%
Research Pressure
F 24% 27% 18% 7%
M 28% 29% 15% 10%
Posting is Hard, Friends are Easy
18% 32% 22% 13%
15% 24% 21% 18%
Abstraction Process
12% 33% 18% 13%
14% 29% 19% 14%
Qualifications
19% 26% 26% 14%
11% 19% 23% 26%
Onboarding hoops
F 13% 30% 21% 13%
M 26% 25% 17% 14%
No "Good-Answer" Guarantee
18% 24% 25% 12%
12% 21% 20% 28%
Intimidating Community Size
10% 26% 22% 19%
8% 13% 25% 35%
Stranger Discomfort
8% 17% 25% 39%
4% 8% 24% 51%
Perception of Slacking
F 10% 12% 28% 22%
M 9% 15% 28% 27%

OBSERVATIONS

Language Divide: There are two types of language that contribute to the *unwelcoming atmosphere* on Stack Overflow: complex questions and idle “boy's club” chatter

OBSERVATIONS

Language Divide: There are two types of language that contribute to the *unwelcoming atmosphere* on Stack Overflow: complex questions and idle “boy's club” chatter

Helpful Intentions: Participants *want to contribute, but do not feel like they can* based on difficulty finding opportunities to post

IMPACT OF IDENTIFYING BARRIERS

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Stack Overflow founder acknowledges novice implications of the work

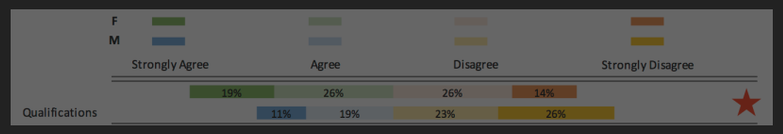
IMPACT OF IDENTIFYING BARRIERS

Stack Overflow founder acknowledges novice implications of the work

Barriers also resonate with SO users on blog.denaeford.me

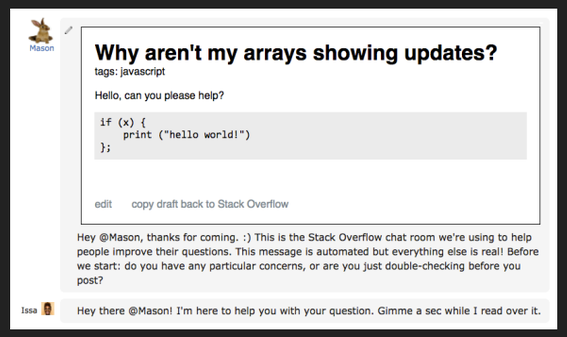
> Really interesting. As a female, minimally-active, but long-time/frequent reader of SO I definitely went through a ran emotions from of early, naive use, intimidation, empathy, regret, etc. I a period of pretty active answering on another SE board gave me a much better understanding of the source of some frustration (and seeming hostility) for SO power users. The Help Vampire is real, and I can see how it'd be easy to become impatient with that. I really like the question suggestion feature, and when editors take the time to comment with the asker in mind, I think it can make a big difference.

TODAY



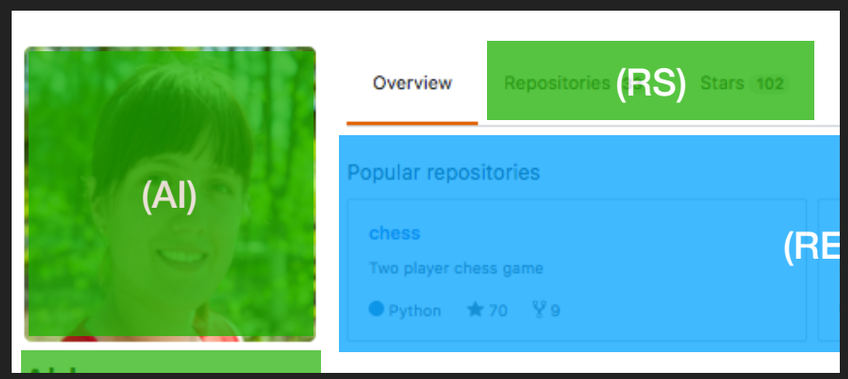
Barriers to Participation

[**Ford**, Smith, Guo, Parnin. FSE 2016]



Mentorship

[**Ford**, Lustig, Banks, Parnin. CHI 2018]



Vision

The Future of Asking

NOVICE EXPERIENCE

Questions are ill-received

0	Why aren't my icons showing?
0	Why aren't my rectangles showing? 1
0	IF… Else + JOption, Why aren't my JOptionPanes showing? 2
1	Why Aren't My Cards Random? 3
-3	Why aren't my divs showing up? [closed] 2
0	Why aren't my validation messages showing? 1

Questions do not follow community etiquette

2 hrs · Seattle, WA ·

More often than not, my posts get downvoted because I didn't follow some arcane etiquette. This hostility to outsiders and new contributors is exactly why I've never bothered editing Wikipedia.

Interested in contributing but don’t know how

“Is there some trick to making it worthwhile to post on Stack Overflow?”

RESEARCH QUESTION

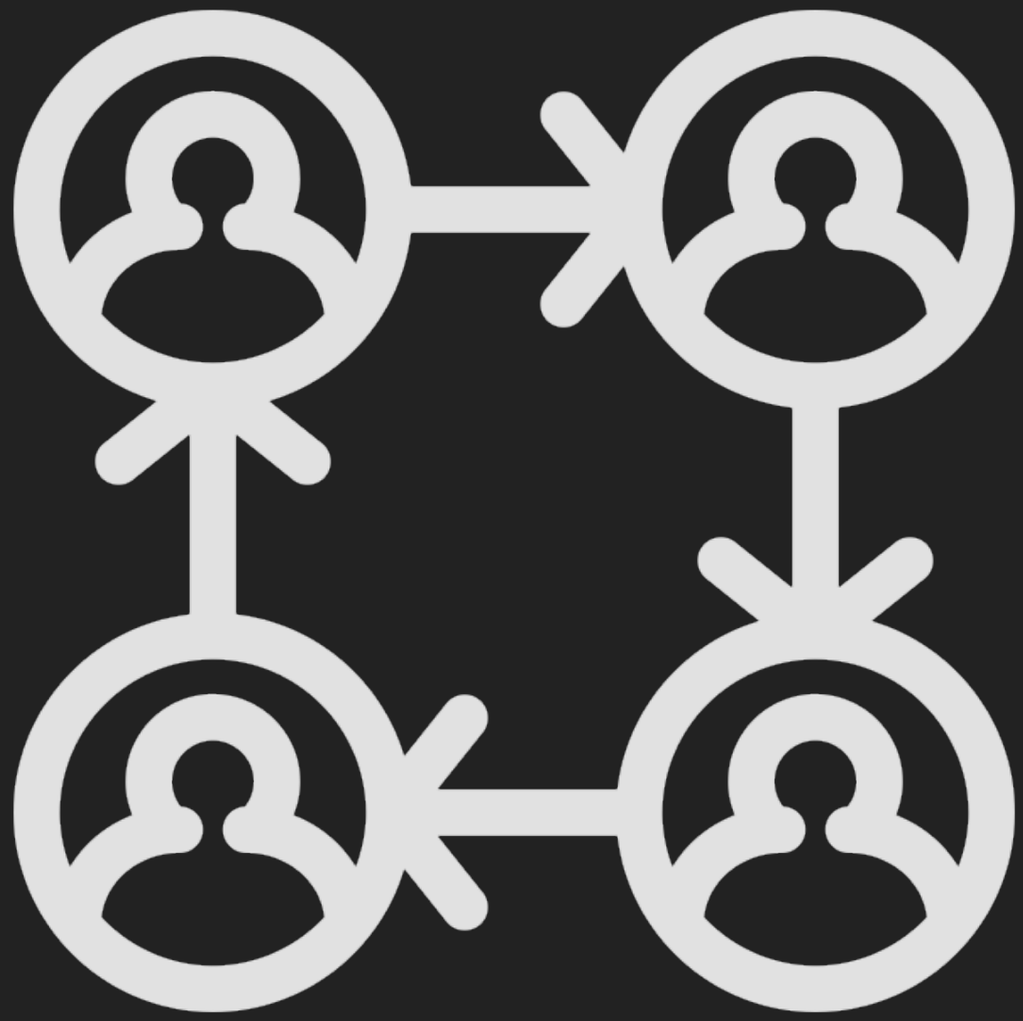
RQ

How can users encourage novices to ask well-received questions?

APPROACH

as a

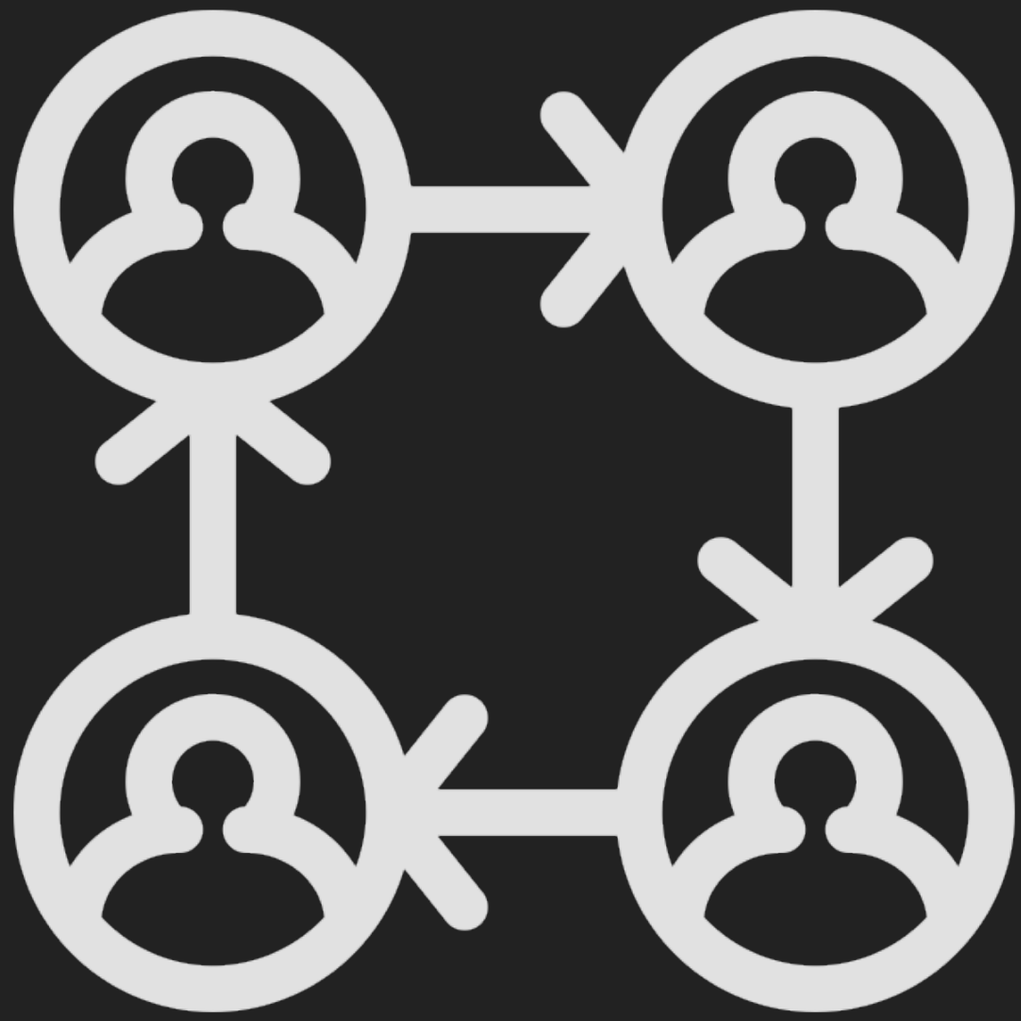
Community of Practice



APPROACH

as a
Community of Practice

where *groups of people bound together by shared expertise and passion for a joint goal*
[Lave 1991]



APPROACH

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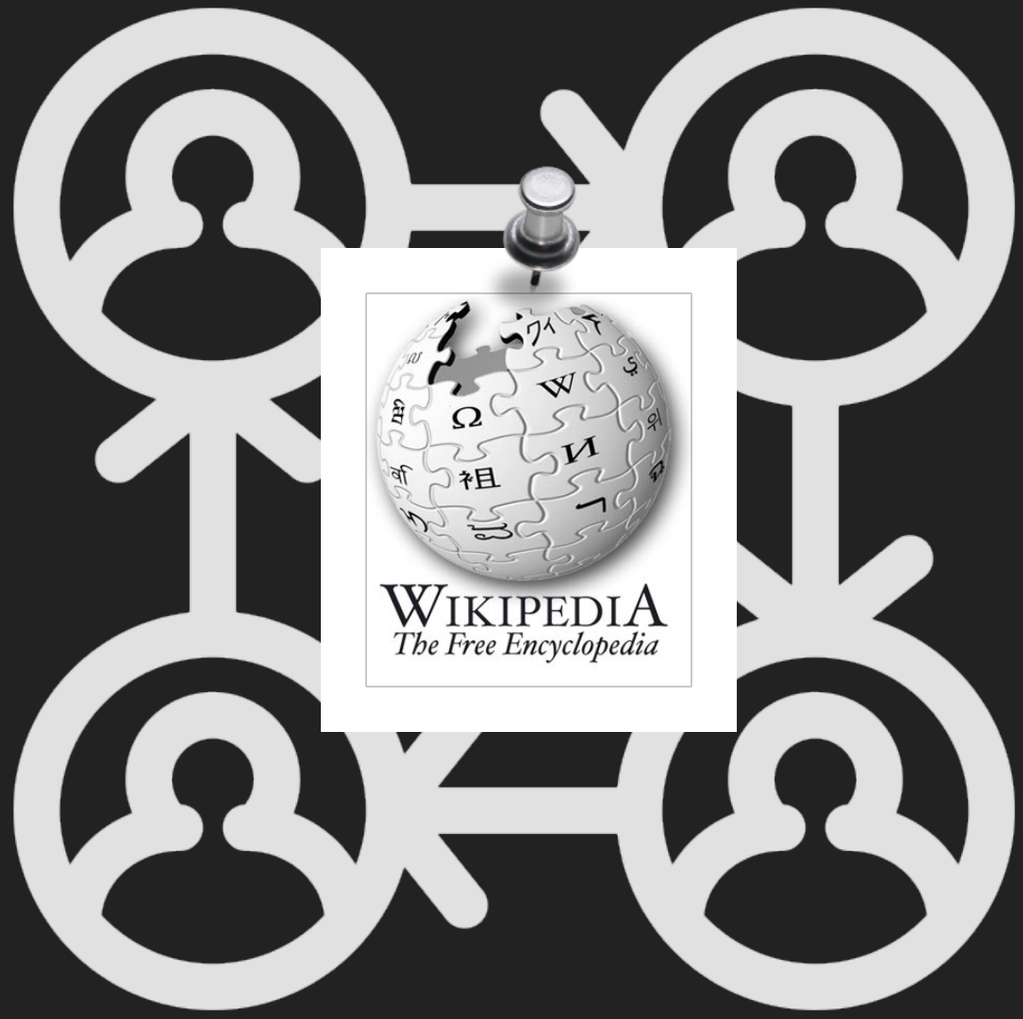
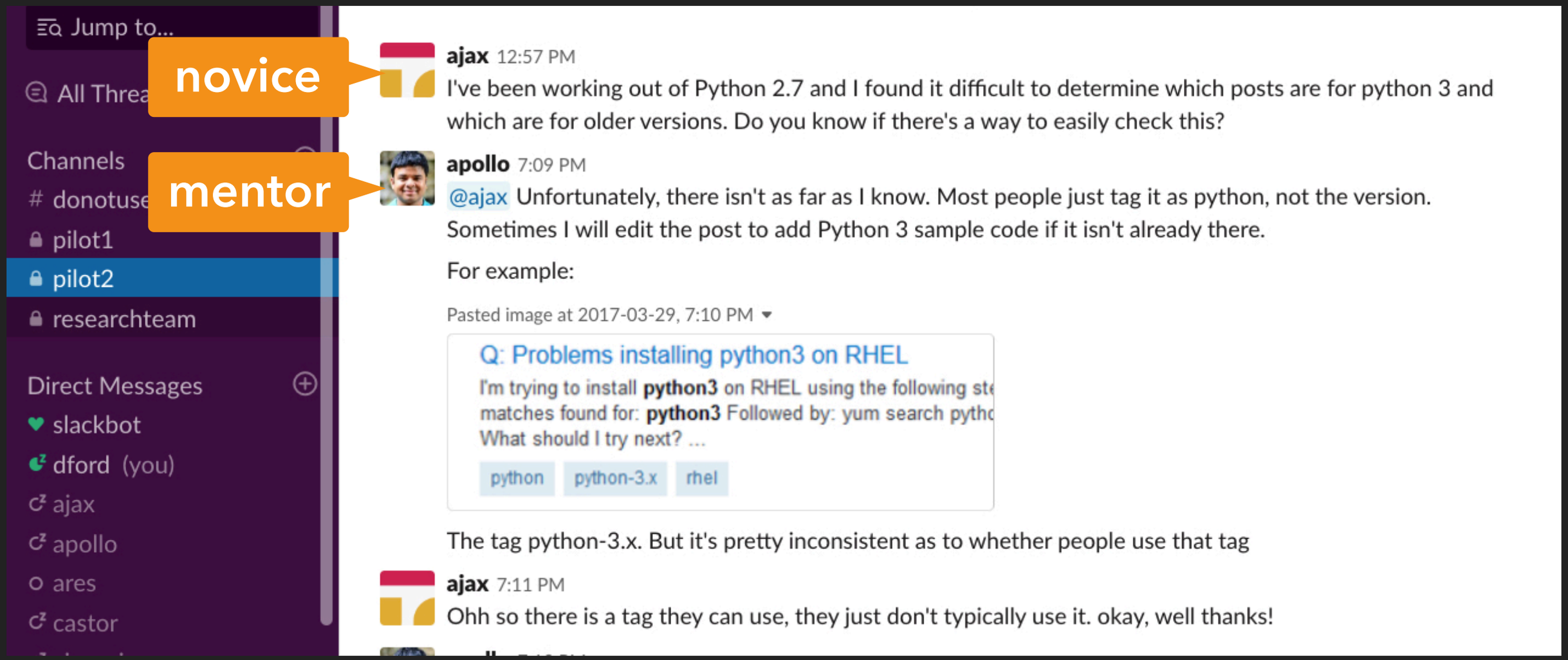
Learning through mutual engagement.

Mutual engagement exposes newcomers to expert practices [Wenger 1998]



EXPLORATORY STUDY



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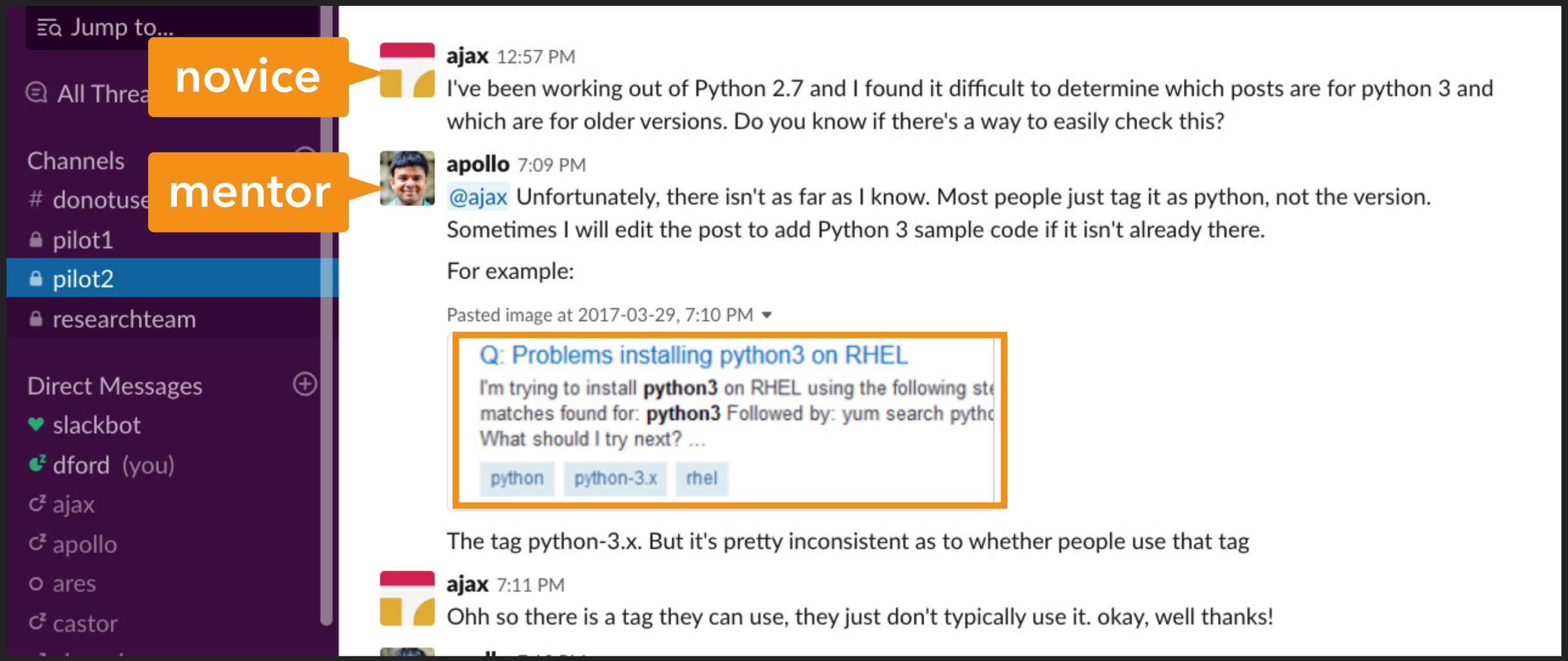
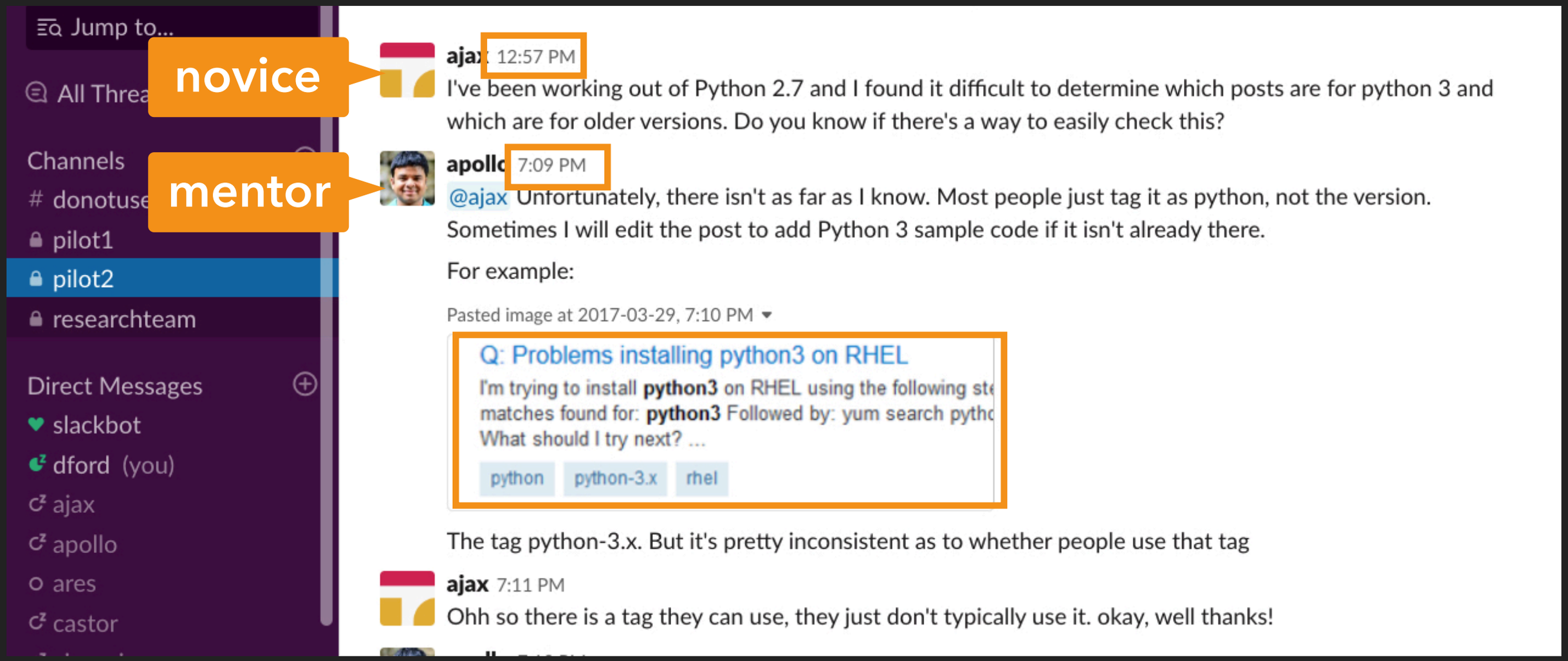


Context switching between platform

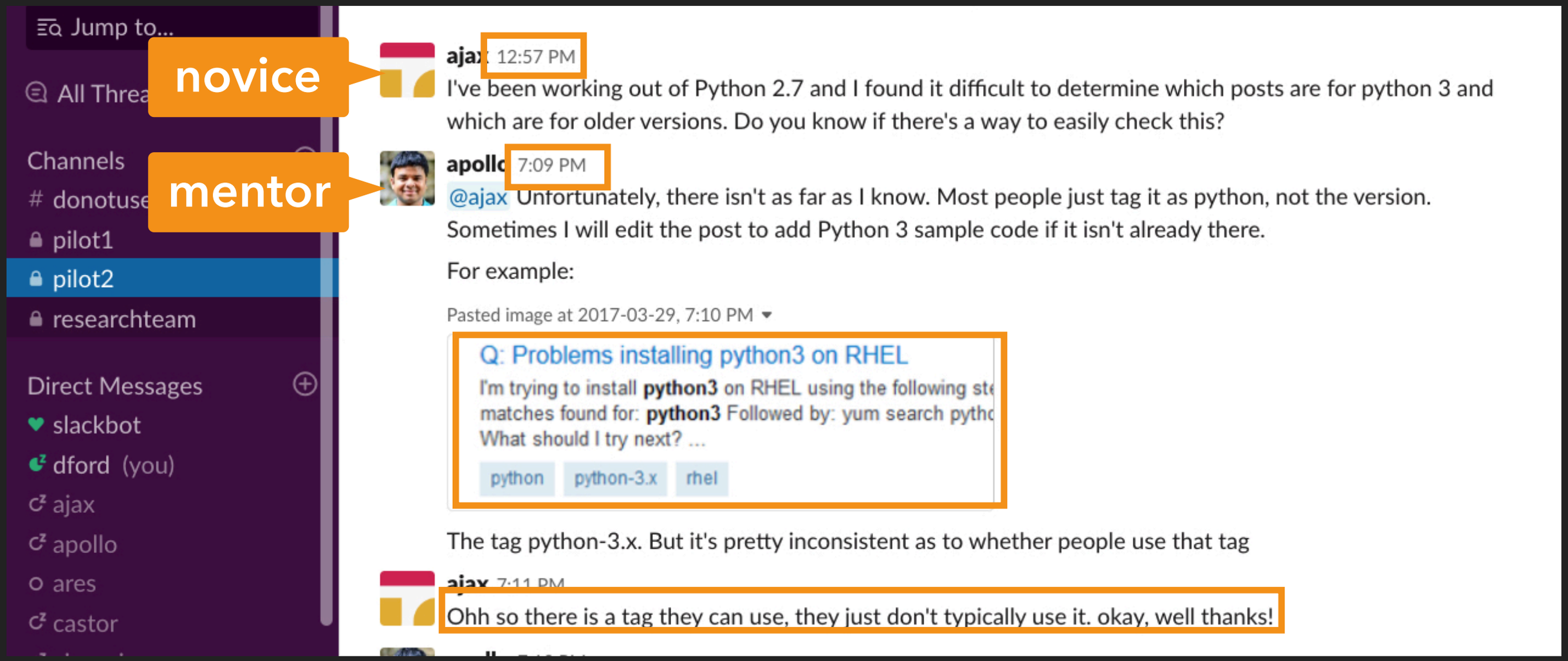
EXPLORATORY STUDY



Context switching between platform

Asynchronous communication

EXPLORATORY STUDY

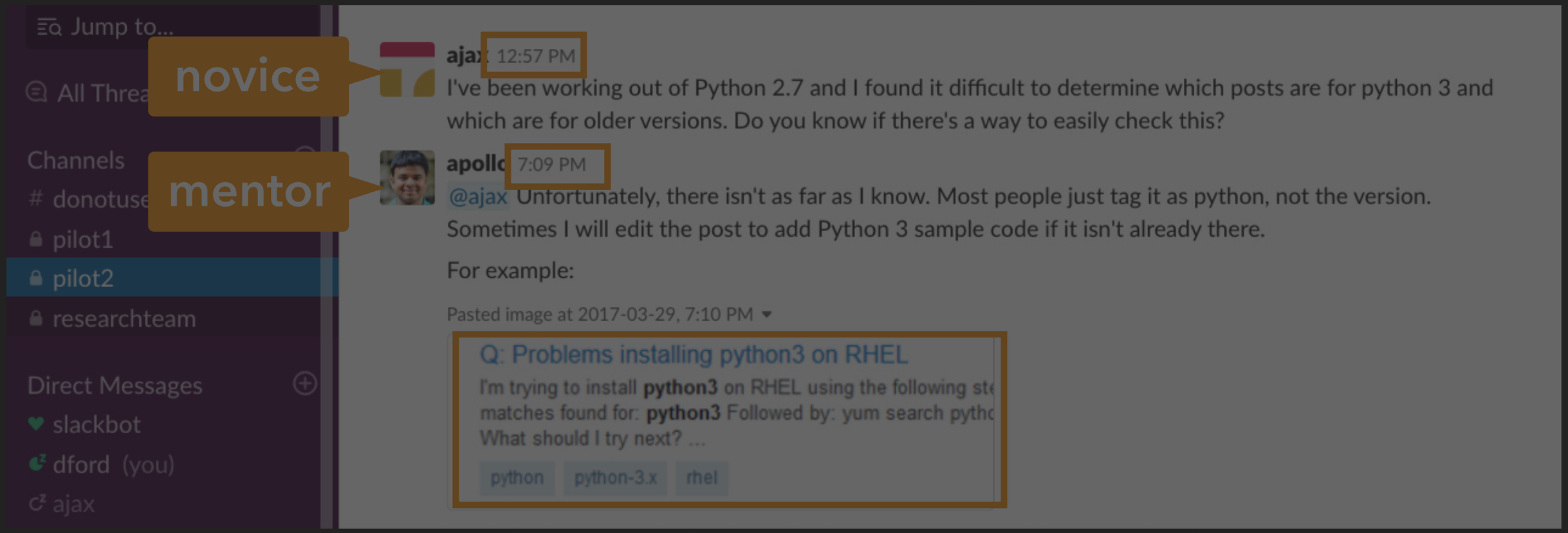


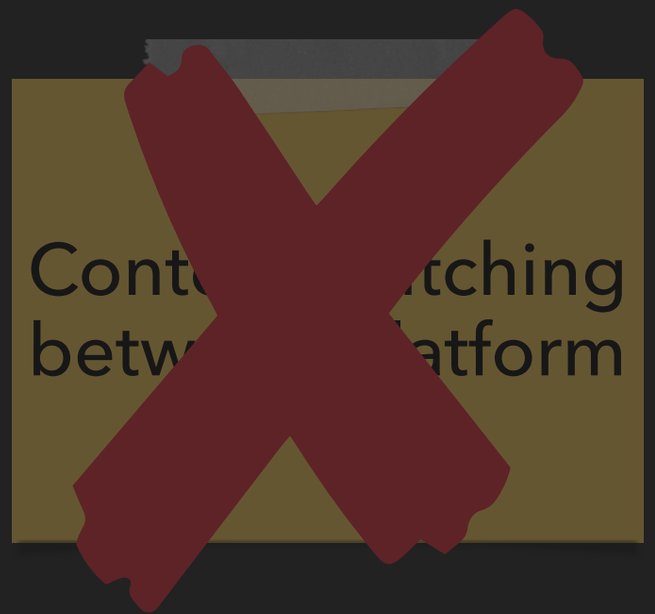
Context switching between platform

Asynchronous communication

Dialogue did not refine questions

DESIGN PRINCIPLES





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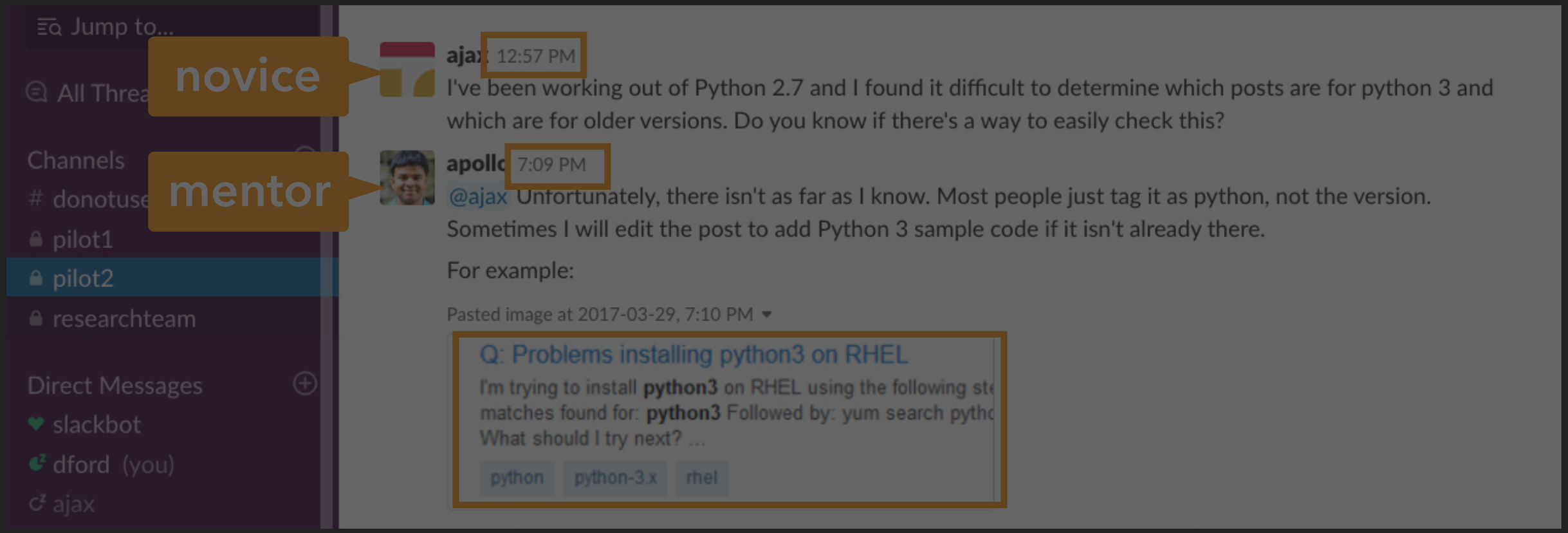


[Epstein et al., 2002]

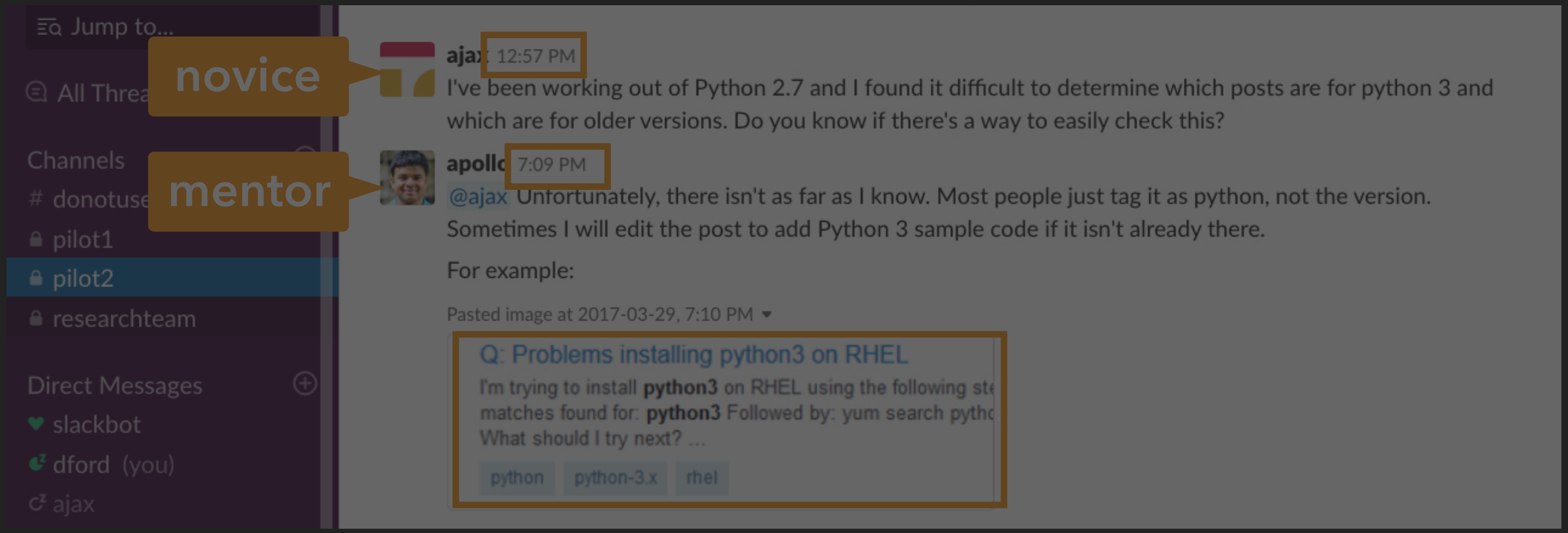
[Kraut et al., 2012]

Allow mistakes in private space

Asy nous
co tion

Dialog d not
refin ons

DESIGN PRINCIPLES



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Allow mistakes in private space

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Provide formative and timely feedback

Dialog d not
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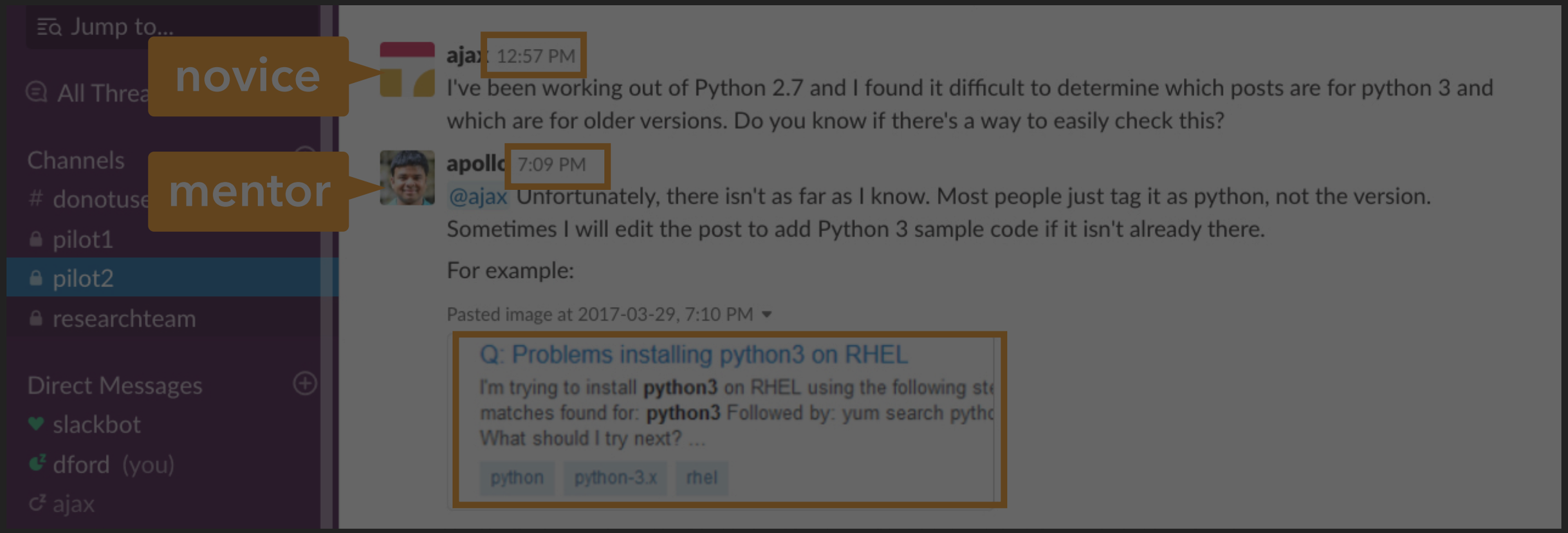

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Allow mistakes in private space

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[Kraut et al., 2012]

Provide formative and timely feedback

[Wenger, 1998]
[Kraut et al., 2012]

Do not answer questions, help others ask better questions

IMPLEMENTED FEATURE

COLLABORATIVE EDITING

IMPLEMENTED FEATURE

COLLABORATIVE EDITING

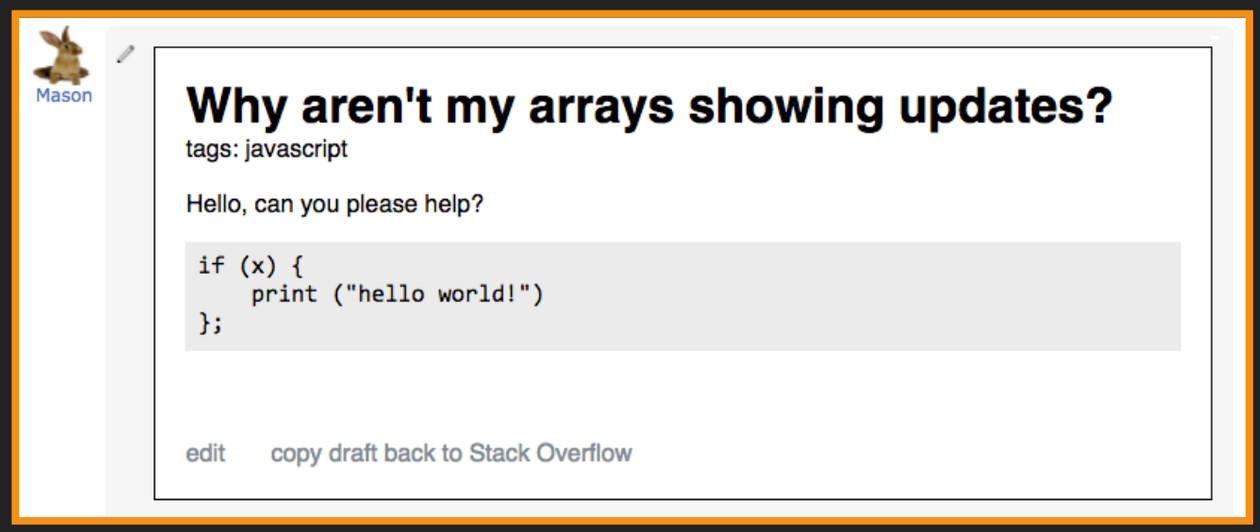
Two core components:

IMPLEMENTED FEATURE

COLLABORATIVE EDITING

Two core components:

1. Collaborative question draft



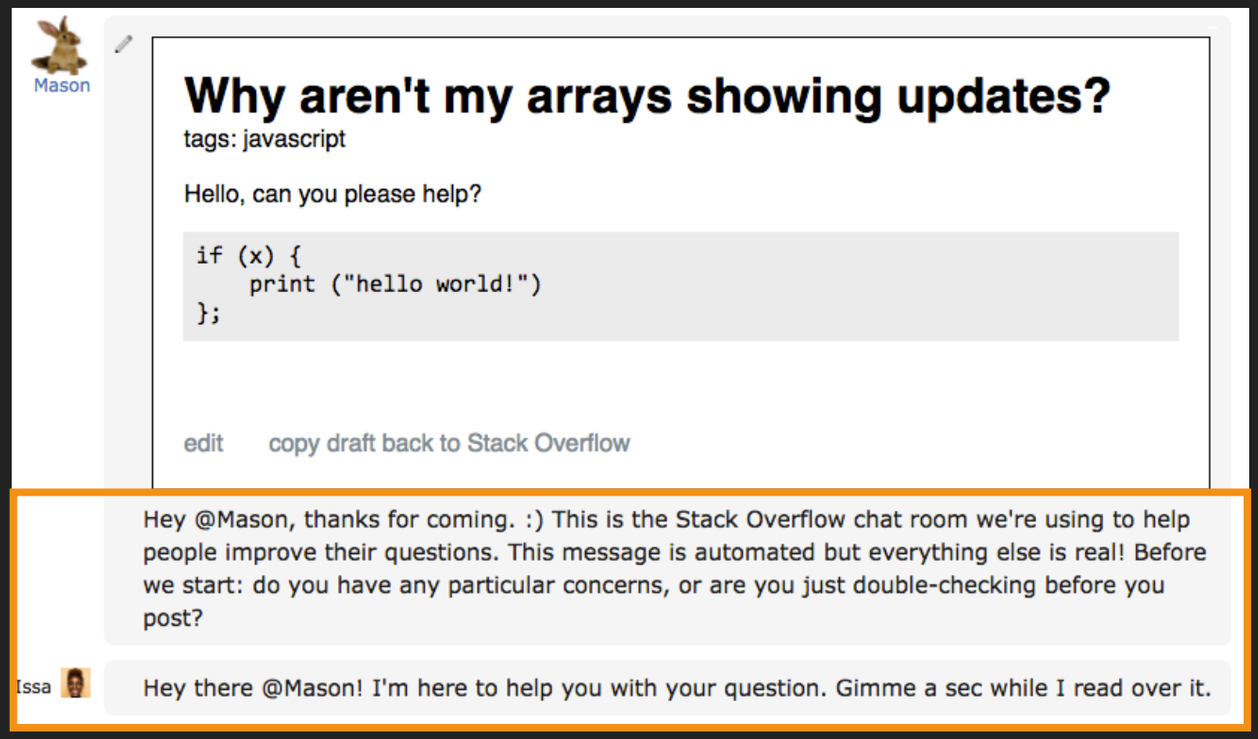
stack overflow

IMPLEMENTED FEATURE

COLLABORATIVE EDITING

Two core components:

1. Collaborative question draft
2. *Help Room* to discuss and edit the draft



stack overflow

Just-In-Time Mentorship Study

STUDY DESIGN GOALS

✓ To observe and measure changes in **question quality**

✓ To understand **feedback** provided by mentors

✓ To improve **experience** for new question askers

✓ To learn how to **scale these benefits** to the whole community

Novice writes question

Questions Developer Jobs Tags Users Search...

Title Why aren't my arrays showing updates?

Questions that may already have your answer

0	Why aren't my icons showing?
0	Why aren't my rectangles showing? 1
0	IF… Else + JOption, Why aren't my JOptionPanes showing? 2
1	Why Aren't My Cards Random? 3
-3	Why aren't my divs showing up? [closed] 2
0	Why aren't my validation messages showing? 1

Links Images Styling/Headers Lists Blockquotes Code HTML advanced help »

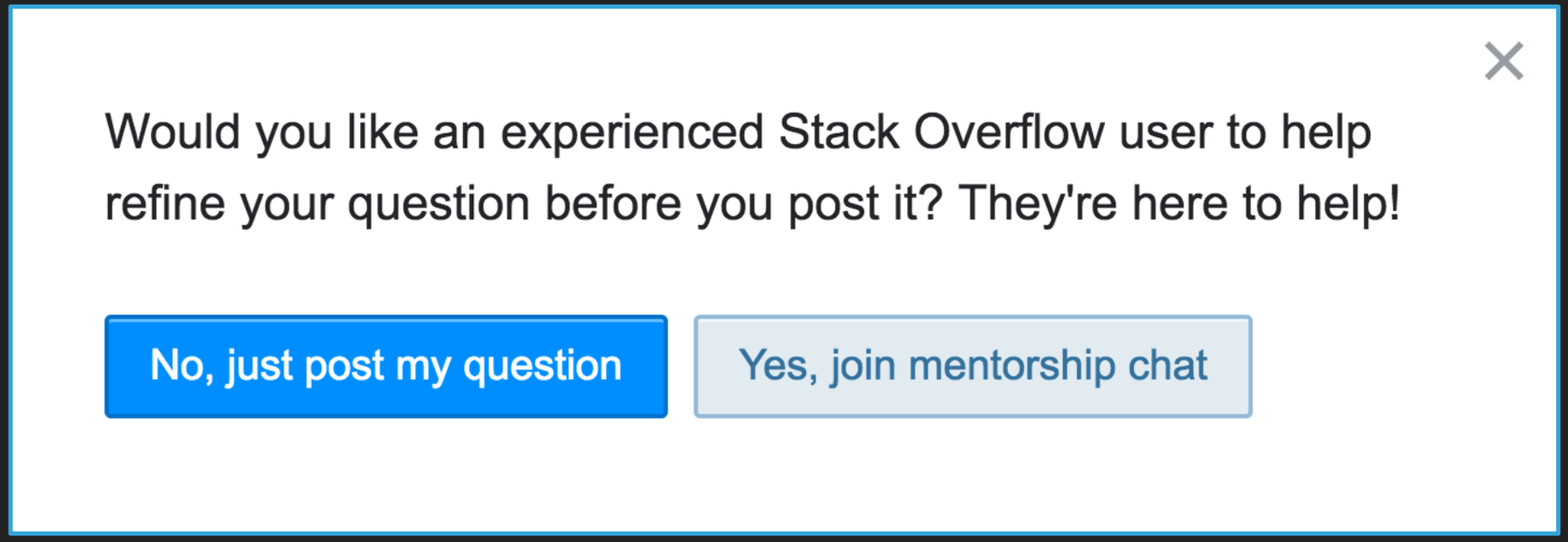
```
I am having a problem with getting this code to work.

    if (x) {
    print("here is some sample code!")
    };

Thank you.
```

Novice writes question

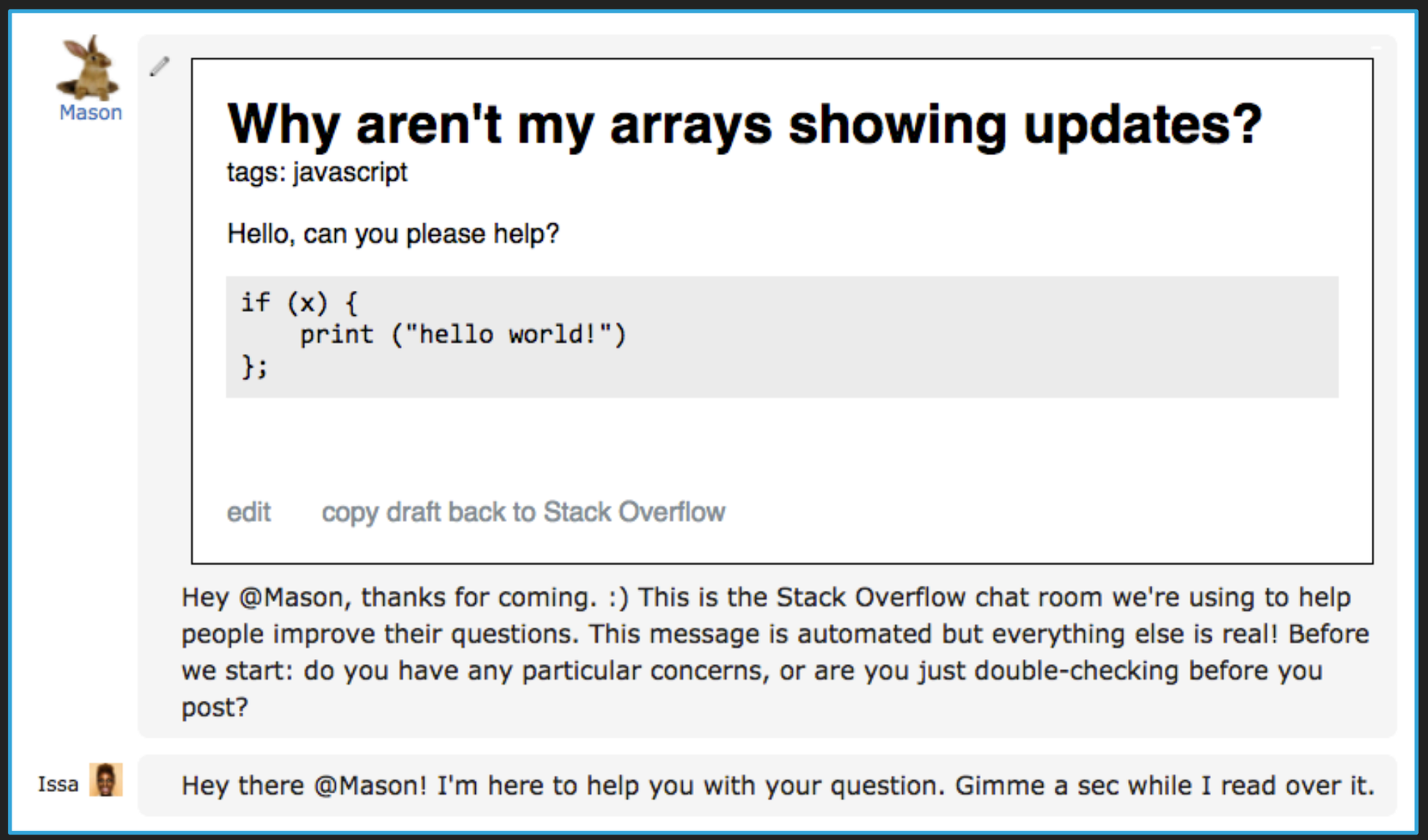
Novice selects to post their question



Novice writes question

Novice selects to post their question

Novice selects to join *Help Room*



Novice writes question

Novice selects to post their question

Novice selects to join *Help Room*

Novice receives feedback on question

Novice edits question draft

Novice writes question

Novice selects to post their question

Novice selects to join *Help Room*

Message in [B] Asking a Question

Edit

```
# Why aren't my arrays showing updates?

tags: javascript

Hello, can you please help?

    if (x) {
        print ("hello world!")
    };

Thank you!
```

Save Draft

You can format your posts using Markdown, as described in our help center.

A few basics: you can apply inline code formatting using `backticks`, and create code blocks by indenting with four spaces. Links are like this: [click here](http://example.com).

Mason

Mon 3:42 PM

Why aren't my arrays showing updates?

tags: javascript

Novice receives feedback on question

Novice writes question

Novice selects to post their question

Novice selects to join *Help Room*

Novice receives feedback on question

Novice edits question draft

Novice posts question

DATA COLLECTED

DATA COLLECTED

33 day study

4 *Help* Rooms

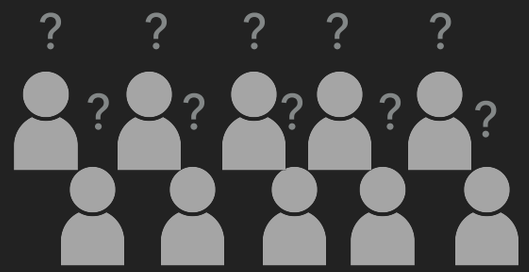
1 *Private Mentor* Room

DATA COLLECTED

33 day study

4 *Help* Rooms

1 *Private Mentor* Room



71,068
Eligible Novices

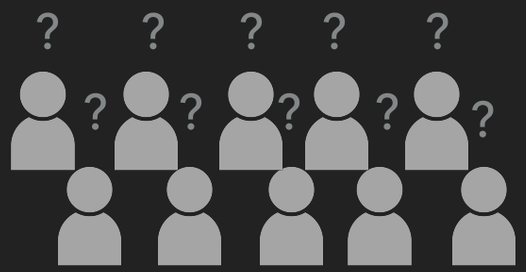
520
Entered Room

DATA COLLECTED

33 day study

4 *Help* Rooms

1 *Private Mentor* Room



71,068
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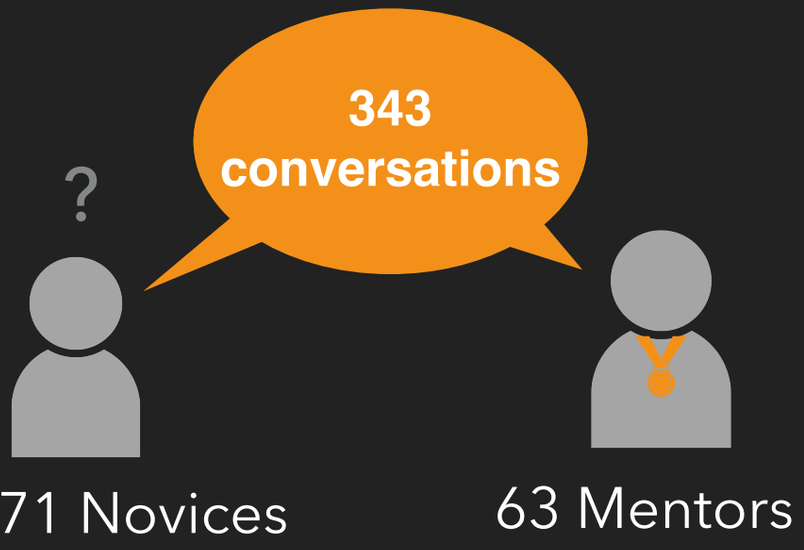
520
Entered Room



271 Novices

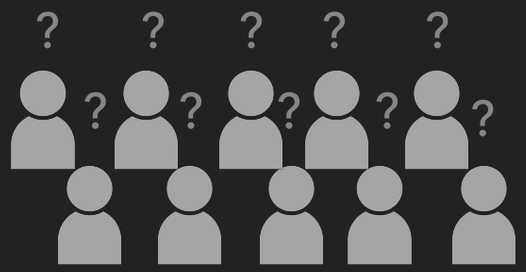
63 Mentors

DATA COLLECTED

33 day study

4 *Help* Rooms

1 *Private Mentor* Room



71,068
Eligible Novices

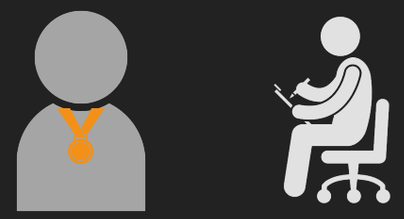
520
Entered Room

271 Novices

63 Mentors

Transcripts + Question Scores

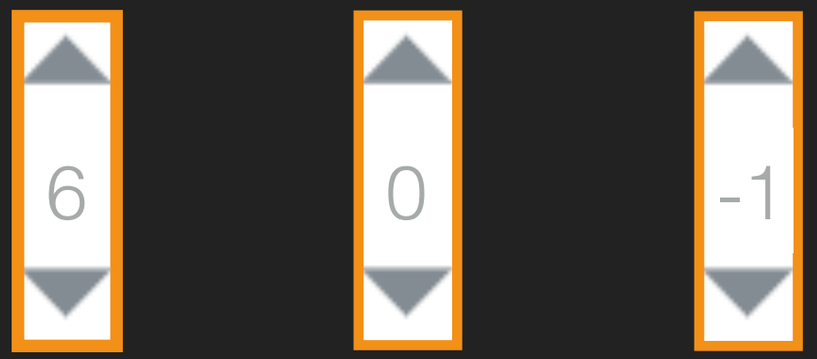
Surveyed Novices



Interviewed Mentors

MENTORED QUESTIONS HAVE HIGHER QUALITY. 46

MENTORED QUESTIONS HAD A **50% SCORE INCREASE** ON AVERAGE



	GOOD	NEUTRAL	BAD
mentored	25%	49%	25%
not mentored (control)	18%	51%	30%

$\chi 2 = 7.48, p = 0.023$

[CHI 2018]

MENTORS SUGGEST HIGH-FIDELITY IMPROVEMENTS.

Paraphrasing title and content (Question Phrasing)

Formatting code to make question scannable

Community triage

Including all the pieces of a question (Question Framing)

Culture of asking

[CHI 2018]

COMMUNITY TRIAGE

"ok the fact is that on SO **you can't ask for libs you would need to do that on another site [link]**" (Mentor)

bash csh

share edit flag

edited Mar 4 '17 at 9:51

Cœur

12.4k • 3 • 79 • 113

asked Apr 26 '10 at 2:23

Daniel

336 • 3 • 5 • 18

closed as off-topic by bummi, Toto, Petr Janeček, keyser, mehow Sep 3 '13 at 12:49

This question appears to be off-topic. The users who voted to close gave this specific reason:

- "Questions on **professional server- or networking-related infrastructure administration** are off-topic for Stack Overflow unless they directly involve programming or programming tools. You may be able to get help on Server Fault." – Toto, Petr Janeček, keyser, Community

If this question can be reworded to fit the rules in the help center, please edit the question.

1 More appropriate for Super User or Server Fault? – sblom Apr 26 '10 at 2:26

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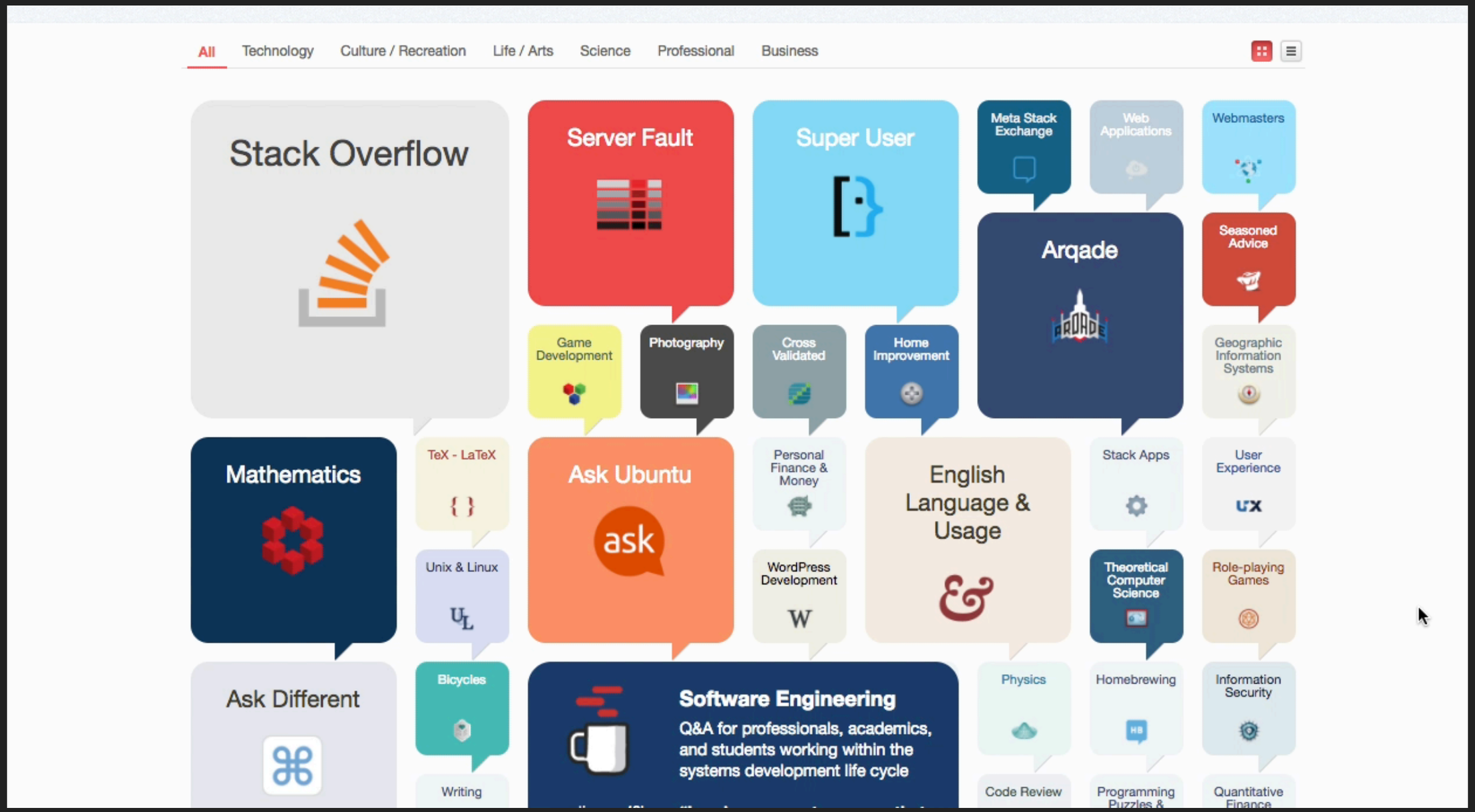

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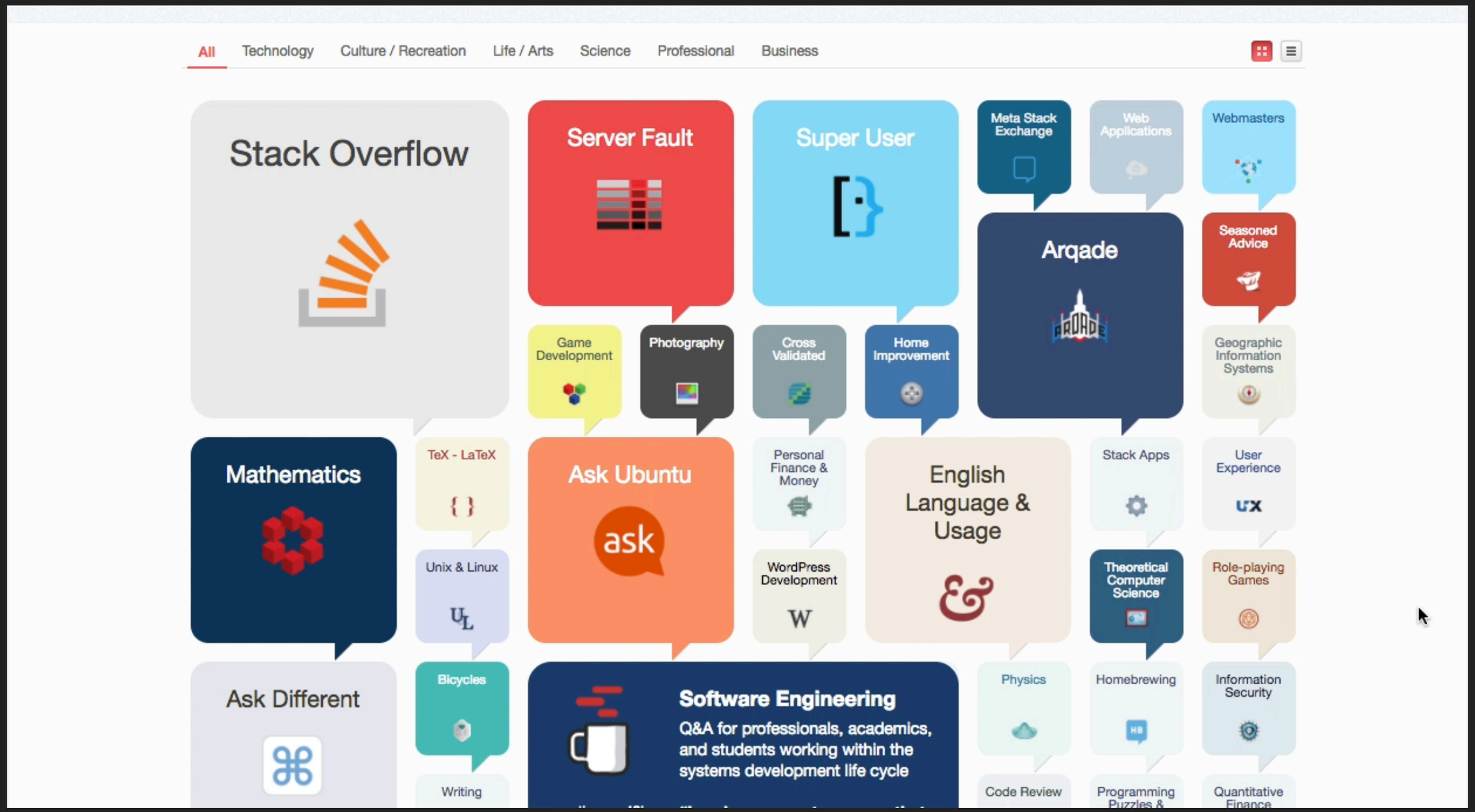

COMMUNITY TRIAGE

“ok the fact is that on SO **you can’t ask for libs you would need to do that on another site [link]**” (Mentor)

”How do I hack a wifi password?” (Novice)

”Your question is **off topic** here. We’re not a hacking service.“(Mentor)

CULTURE OF ASKING

"You also might want to edit out the "Thank you!" at the end. **I know it seems polite, but people object to it on SO**." (Mentor)

Converting Javascript Ajax code to jQuery [closed]

I need converting this code to jQuery.

Thank you very much.

-3

```
function myItem(id,  page) {
      AjaxPost(WEB_URL+'/myitems.inc.php', "page="+page+"&id="+id,
          function () {
              if (xmlHttp.readyState == 4 || xmlHttp.readyState == "complete") {
                  div('myItem_box').innerHTML += xmlHttp.responseText;
              }
          }
      )
  }
```

javascript jquery ajax

share edit flag

edited Nov 3 '13 at 18:56

Marcel Korpel

18.7k • 4 • 51 • 71

asked Nov 3 '13 at 18:51

Peter

1 • 1

CULTURE OF ASKING

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javascript jquery ajax

share edit flag

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18.7k ● 4 ● 51 ● 71

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Peter

1 ● 1

CULTURE OF ASKING

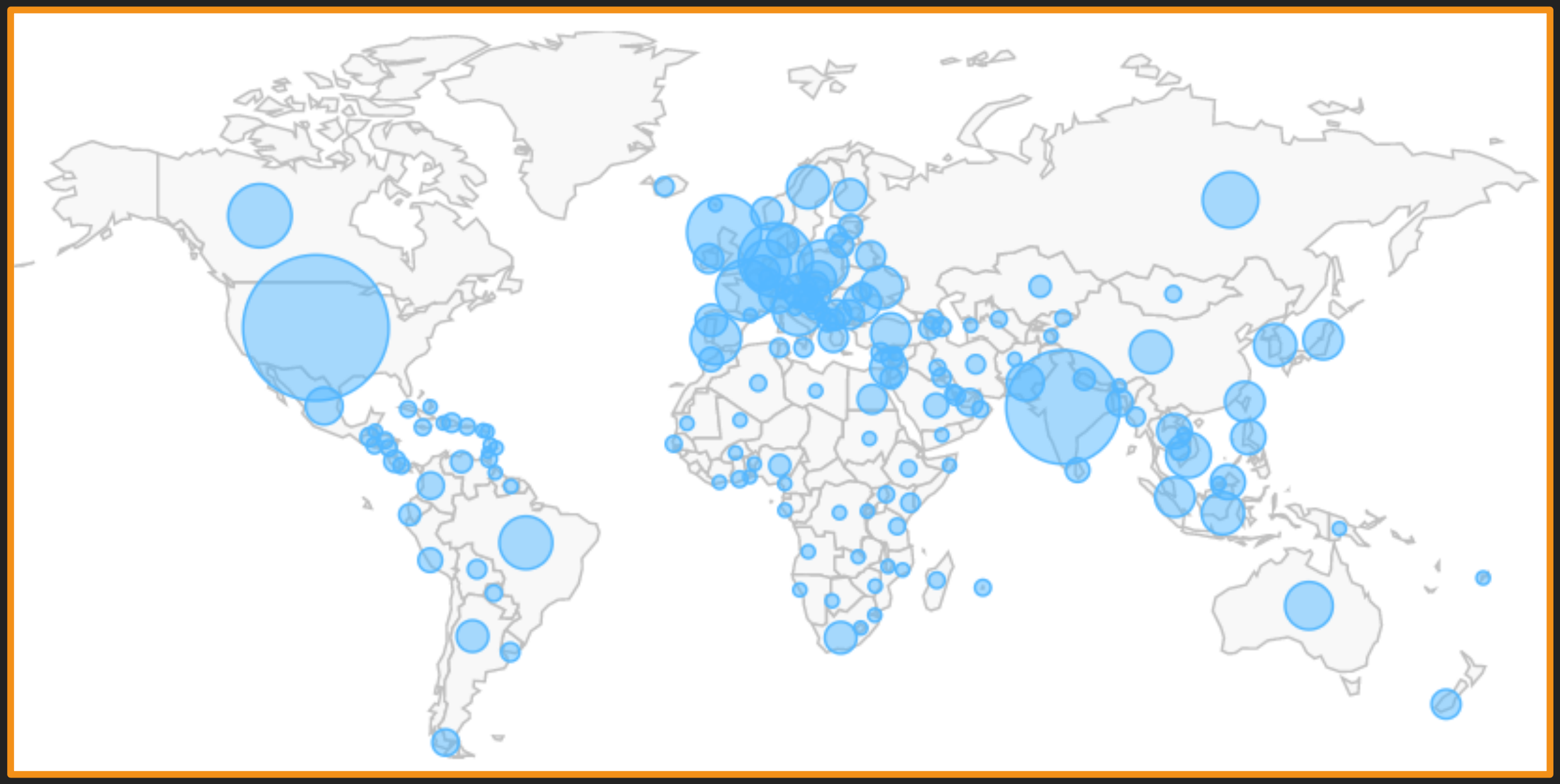
"You also might want to edit out the "Thank you!" at the end. **I know it seems polite, but people object to it on SO**." (Mentor)

"**While it's good to be social**, it's kind of just fluff on a Q&A site." (Mentor)

"Ok thanks for you help. I hope this time people won't **attack me**." (Novice)

FUTURE WORK

Mentors used identity as a signal. How and why?



[Stack Overflow 2018 Developer Survey]

FUTURE WORK

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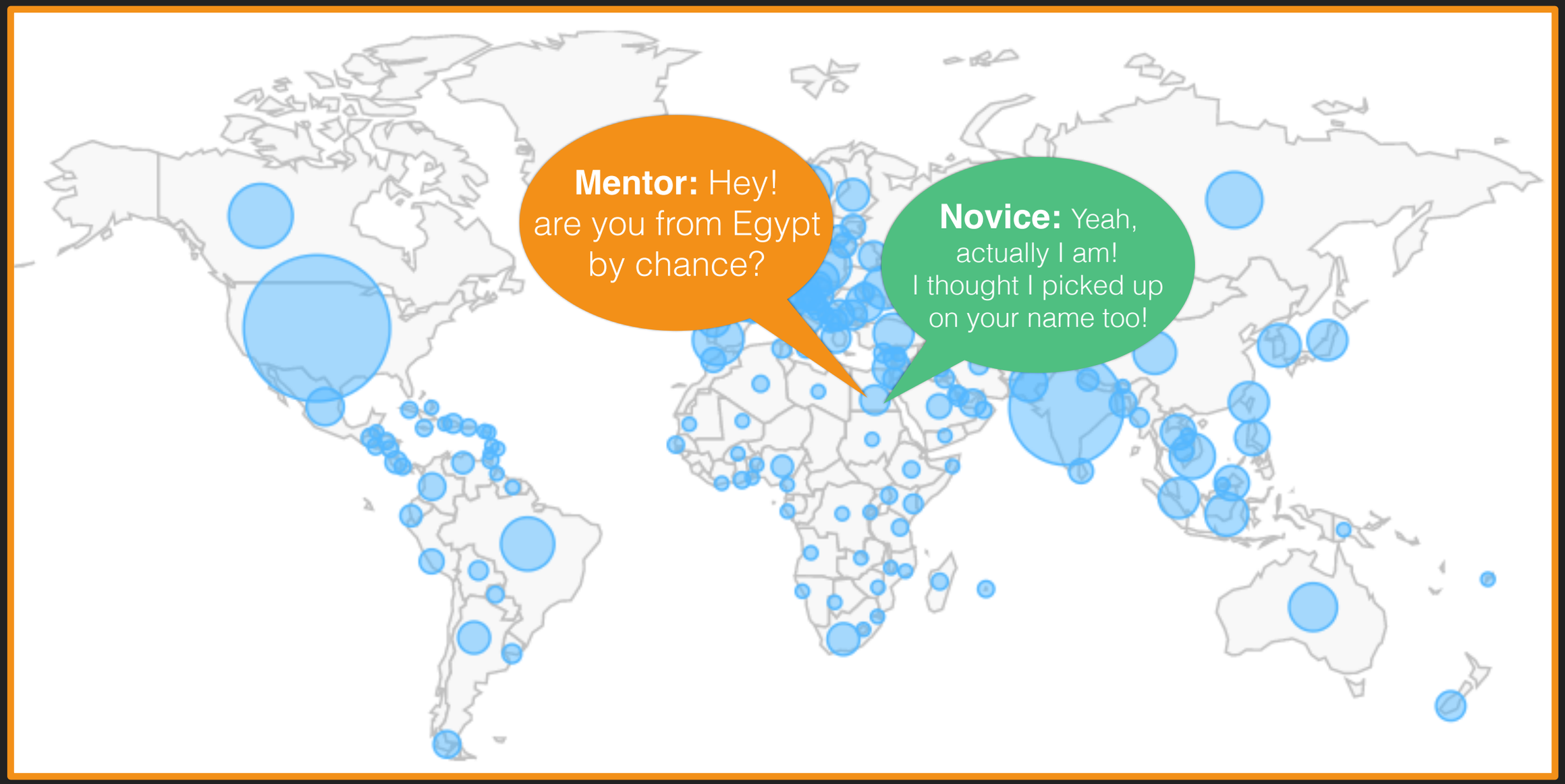

[Stack Overflow 2018 Developer Survey]

FUTURE WORK

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[Stack Overflow 2018 Developer Survey]

IMPACT OF JUST-IN-TIME MENTORSHIP

[CHI 2018]

IMPACT OF JUST-IN-TIME MENTORSHIP

Stack Overflow Isn't Very Welcoming. It's Time for That to Change.

by Jay Hanlon on April 26, 2018

6.5K

We <3 and believe in Stack Overflow. But sometimes, loving something means caring enough to admit that it has a problem.

Let's start with the painful truth:

- Too many people experience Stack Overflow[1] as a hostile or elitist place, especially newer coders, women, people of color, and others in marginalized groups.
- Our employees and community have cared about this for a long time, but we've struggled to talk about it publicly or to sufficiently prioritize it in recent years. And results matter more than intentions.

EVP acknowledges community challenge how mentorship forged a new experience

[CHI 2018]

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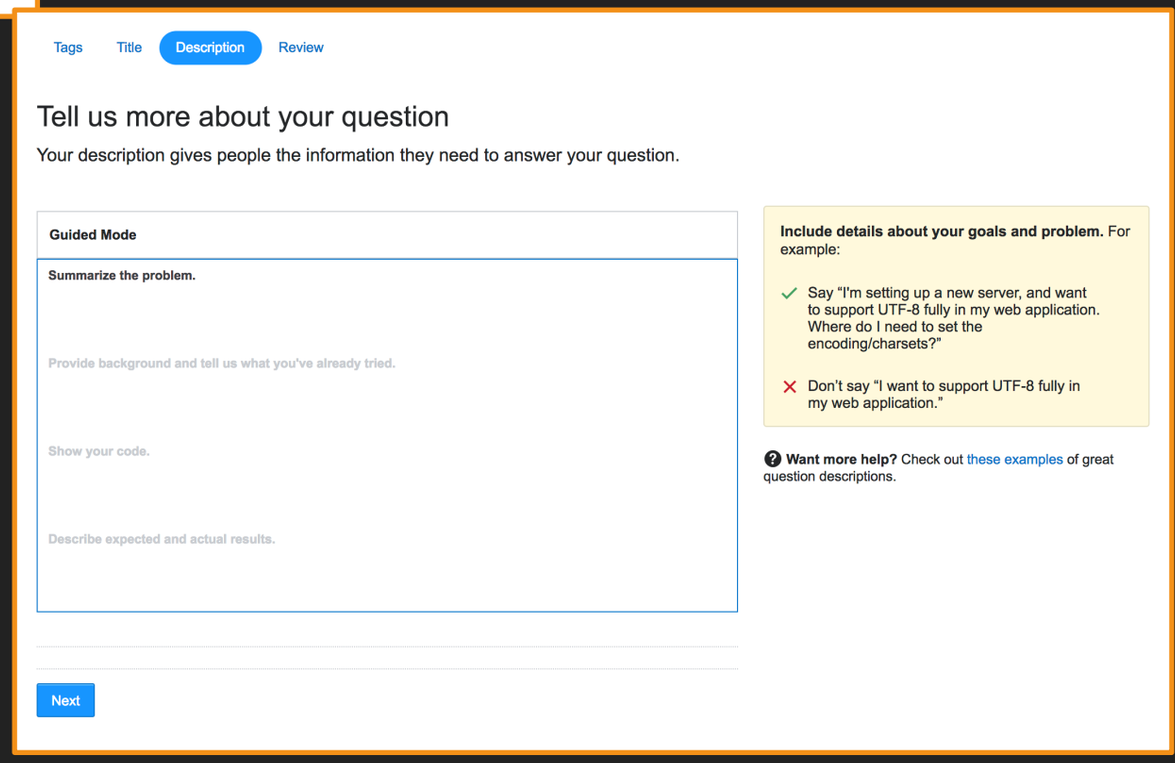
EVP acknowledges community challenge how mentorship forged a new experience

Resulted in Question Asking Template for Novices



[CHI 2018]

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about it publicly or to sufficiently prioritize
intentions.

Julia Silge
@juliasilge

Follow

Probably my favorite academic research partnership to date was the mentorship experiment, headed up by @kristinalustig and @DenaeFord. We are excited to be more organized from here on out to make space for more great projects! 🎉

Mentorship Research Project - Results + Wrap-Up
Check out SO Podcast 117 to hear Kristina talk about the mentorship experiment. First, if you haven't read the original announcement post about the Stack Overflow ...
meta.stackoverflow.com

EVP acknowledges
challenge how
forged a new
erience

Resulted in Question Asking Template for Novices

wer your question.

Provide background and tell us what you've already tried.

Show your code.

Describe expected and actual results.

Next

Include details about your goals and problem. For example:

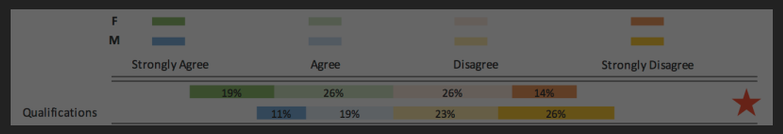
✓ Say "I'm setting up a new server, and want to support UTF-8 fully in my web application. Where do I need to set the encoding/charsets?"

✗ Don't say "I want to support UTF-8 fully in my web application."

Want more help? Check out these examples of great question descriptions.

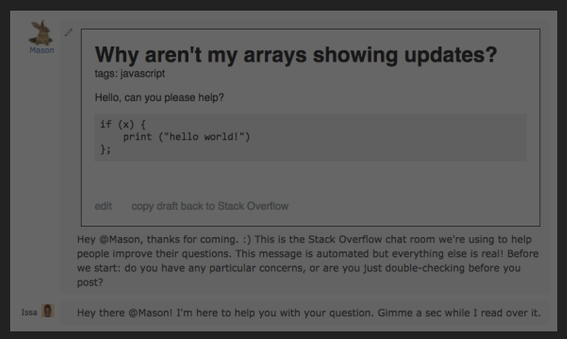
[CHI 2018]

TODAY



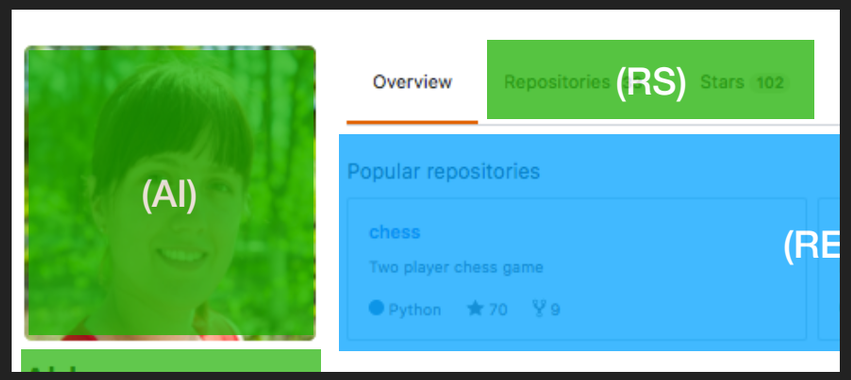
Barriers to Participation

[**Ford**, Smith, Guo, Parnin. FSE 2016]



Mentorship

[**Ford**, Lustig, Banks, Parnin. CHI 2018]

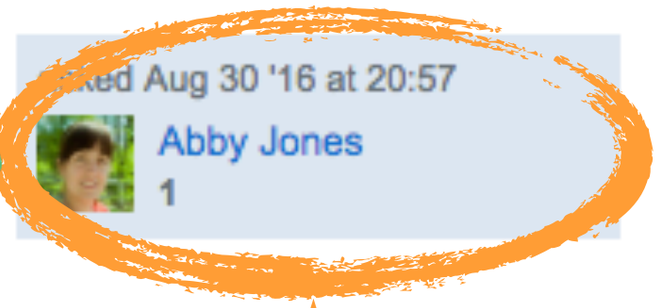


Vision

The Future of Asking

r igraph network-analysis

share edit



QUESTION

ver

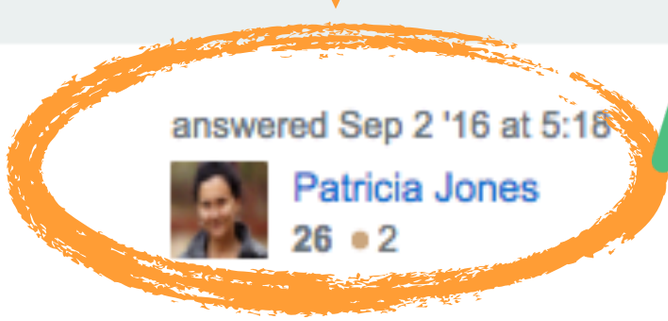
active oldest votes

I think the actual problem may be an off-by-one error for the theoretical max. Calculating it manually gives you 3 * 4 = 12, which agrees with use of centralize(normalize=FALSE), but the R output from centralization.degree seems to be 4 * 5 = 20. To solve your problem I'd suggest using the following code to normalize it yourself.

```
> newCentralization = function(h) centralize(degree(h),normalize=FALSE)/((vcount(h)-1)*(vcou
> newCentralization(h)
[1] 1

> sessionInfo()
    attached base packages:
[1] stats     graphics  grDevices utils     datasets  methods
[1] igraph_1.0.1
```

ANSWER



share edit

Thanks so much Patricia! – Abby Jones Sep 7 '16 at 17:06

BLOG

A Tale of Two In
Programming La
Between Wealth

FEATURED ON META

Sunsetting Docu

Should we burni

Documentation i
next?

Linked

1935 How to make a g
example?

Related

3 Sort and subset
property in R usi

5 Changing node/v
R

5 Using geo-coordi
coordinates in the

0 r and igraph Help
with Weighted E

http://bit.ly/SimpleGenderComputer

[VL/HCC 2017]

r igraph network-analysis

share edit

ver

ed Aug 30 '16 at 20:57

Abby Jones
1

QUESTION

active oldest votes

I think the act
manually give
output from c
the following

Women who experience peer parity re-engage sooner.

```
> newCentral
> newCentral
[1] 1

> sessionInfo()
    attached base packages:
[1] stats     graphics  grDevices utils     datasets  methods
[1] igraph_1.0.1
```

share edit

ANSWER

answered Sep 2 '16 at 5:16

Patricia Jones
26 ● 2

Thanks so much Patricia! – Abby Jones Sep 7 '16 at 17:06

BLOG

A Tale of Two In
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[VL/HCC 2017]

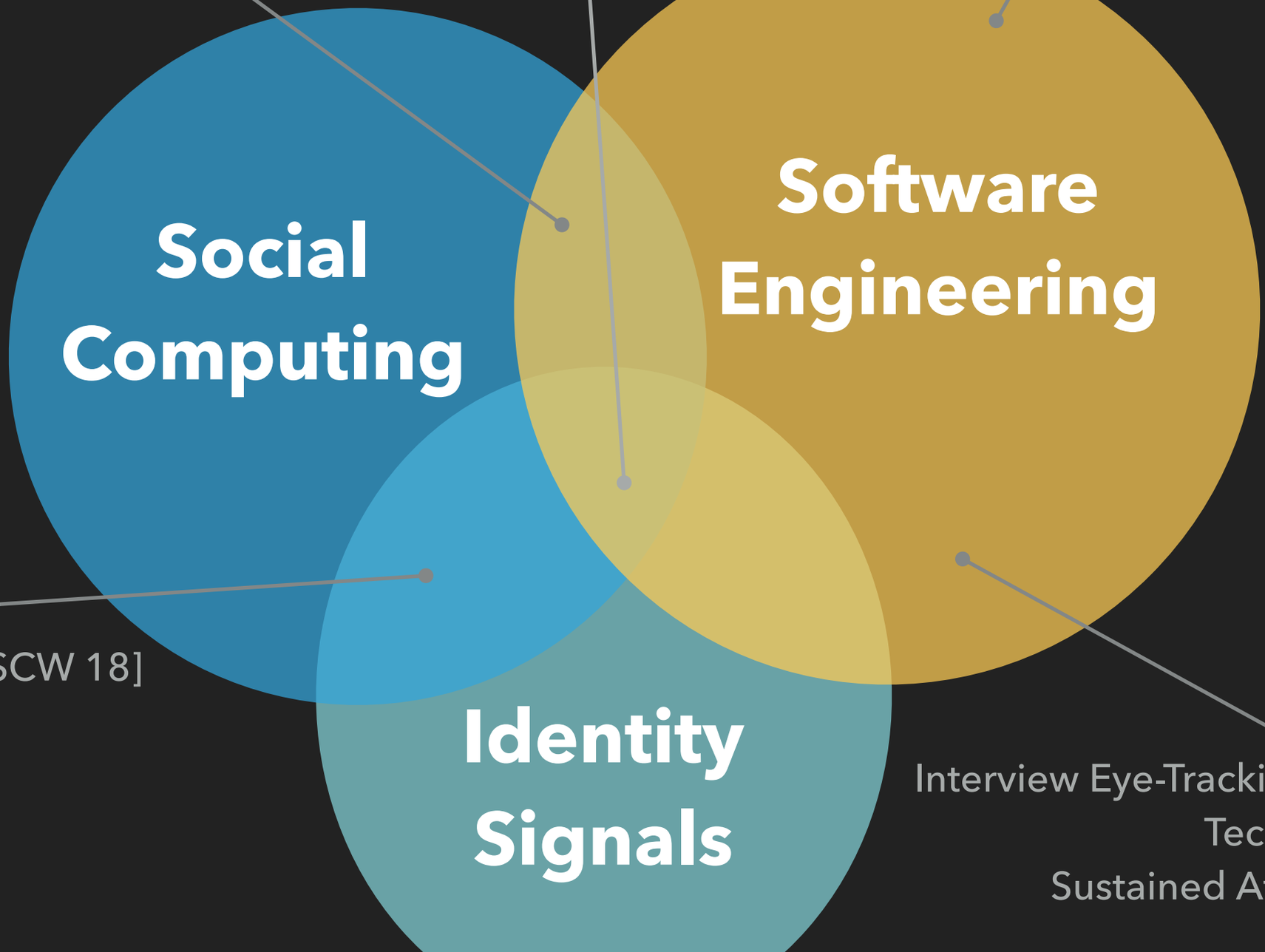
What does asking for help in the future look like?

FUTURE OF ASKING FOR TECHNICAL HELP

SO Mentorship [CHI 18]
SO Compiler Errors [FSE 18]
SO Barriers [FSE 16]
Frustrated Devs [CHASE 15]

GH Signals [ICSE SEIS 19]
Peer Parity [VLHCC 17]

Characterizing Devs [ESEM 17]
Tool Notifications [FSE 16]



Identity
Movements [CSCW 18]

Interview Eye-Tracking [ICSE NIER 18]
Tech Talk [CHASE 17]
Sustained Attention [EMIP 15]

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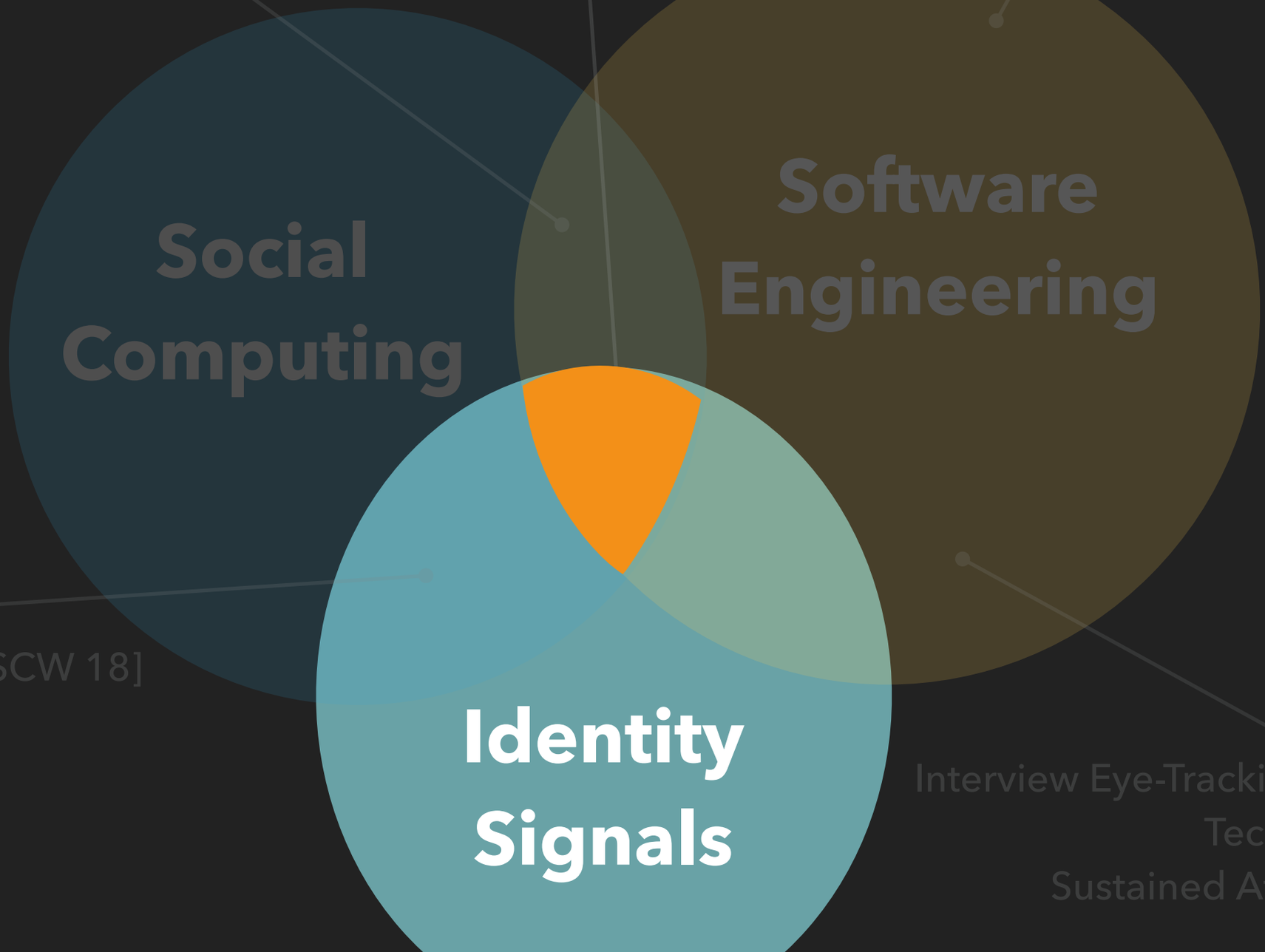

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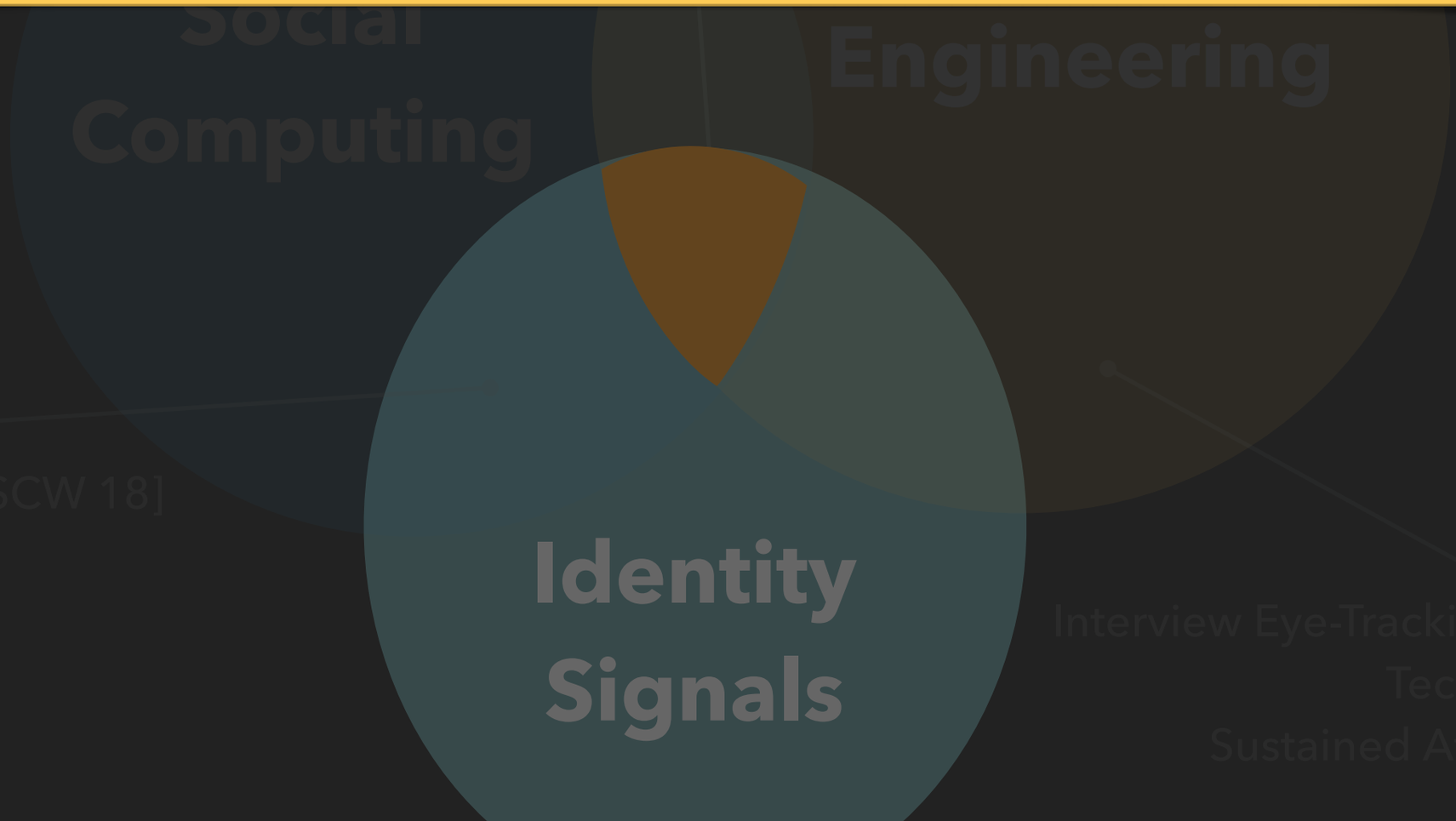
"Software is being developed by increasingly distributed and increasingly diverse groups of individuals."

- Vasilescu



Identity Movements [CSCW 18]
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FUTURE OF ASKING FOR TECHNICAL HELP

"Software is being developed by increasingly distributed and increasingly diverse groups of individuals."

- Vasilescu

How a programmer's identity is presented will become increasingly influential.

- Ford

1. HOW DO WE USE IDENTITY CUES TO TRUST CODE FROM STRANGERS?

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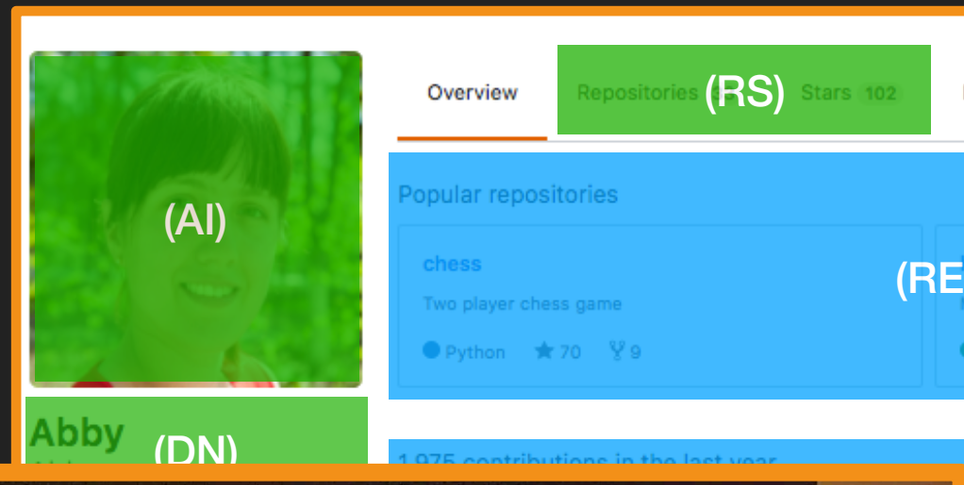
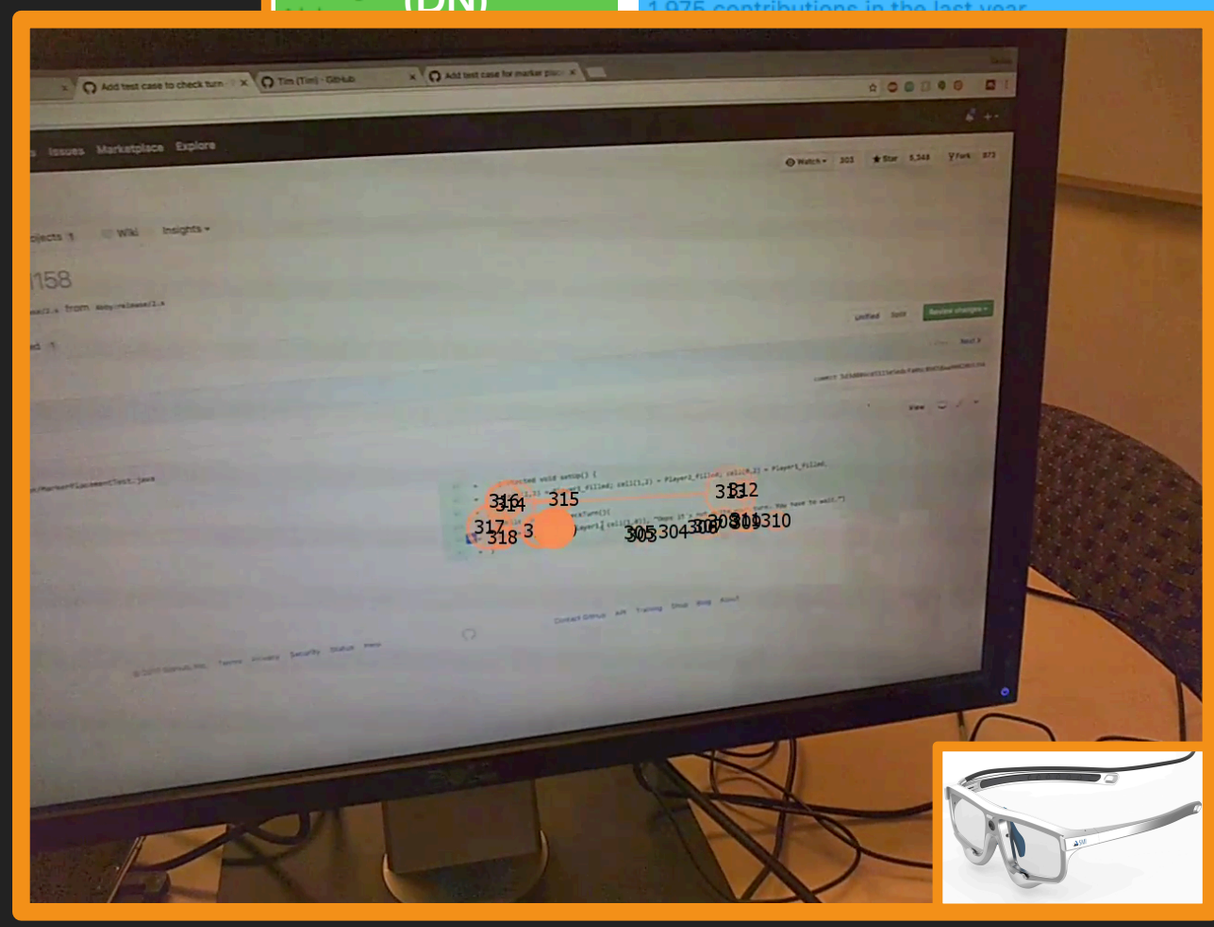


How do signals change based on “code” attributes?



[ICSE SEIS 2019]

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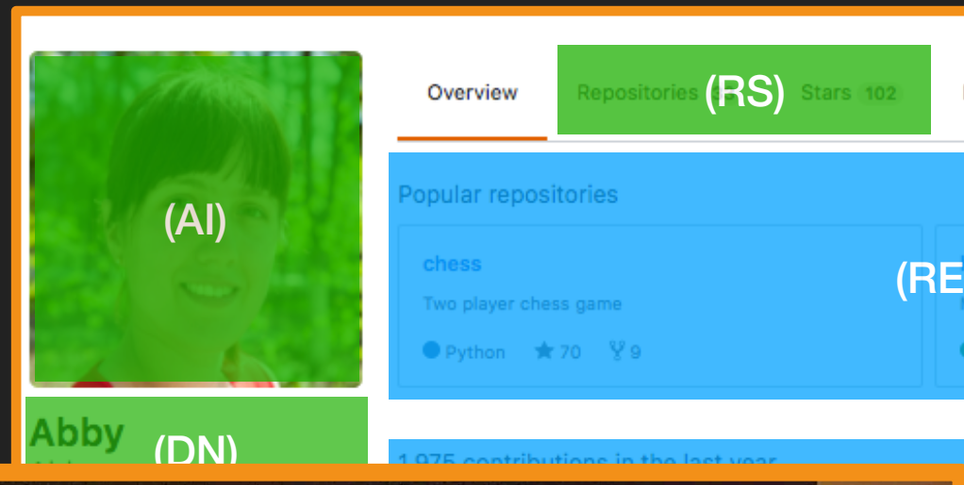
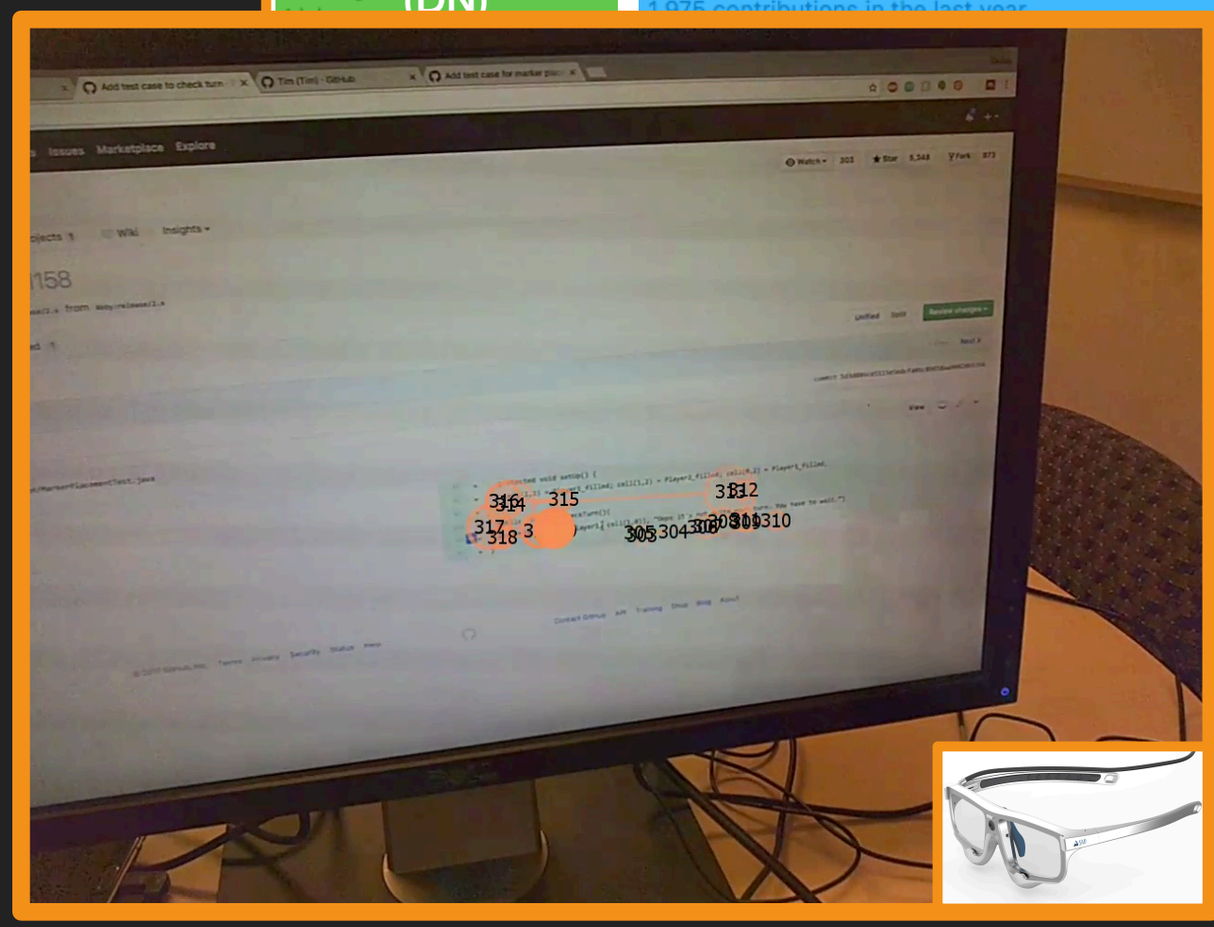


How do signals change based on “code” attributes?

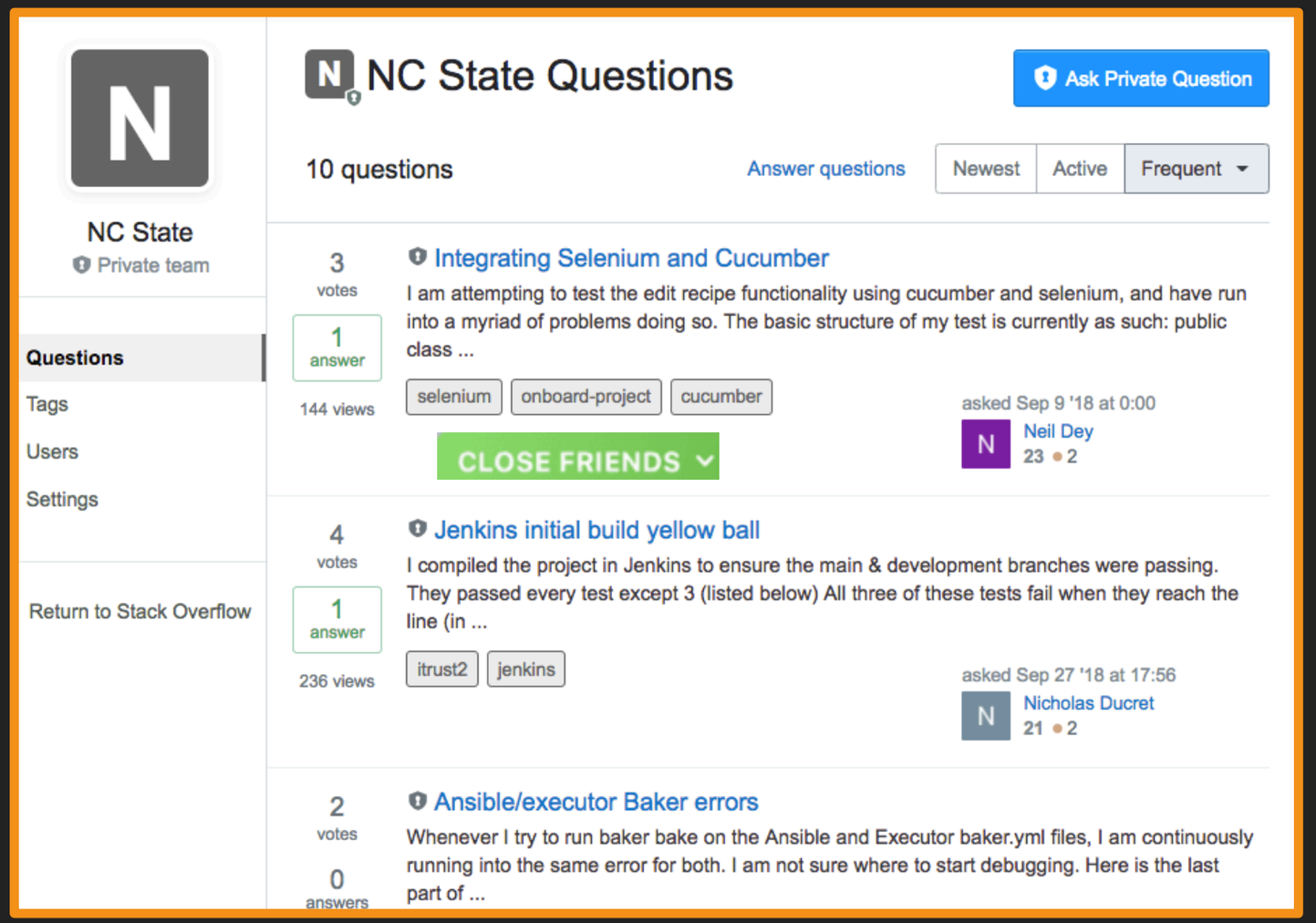
How can we build tools to better reflect contributions?



[ICSE SEIS 2019]

2. HOW CAN WE NATURALLY TRANSITION BETWEEN PUBLIC AND PRIVATE HELP SPACES?

How does asking change when audience is specialized?



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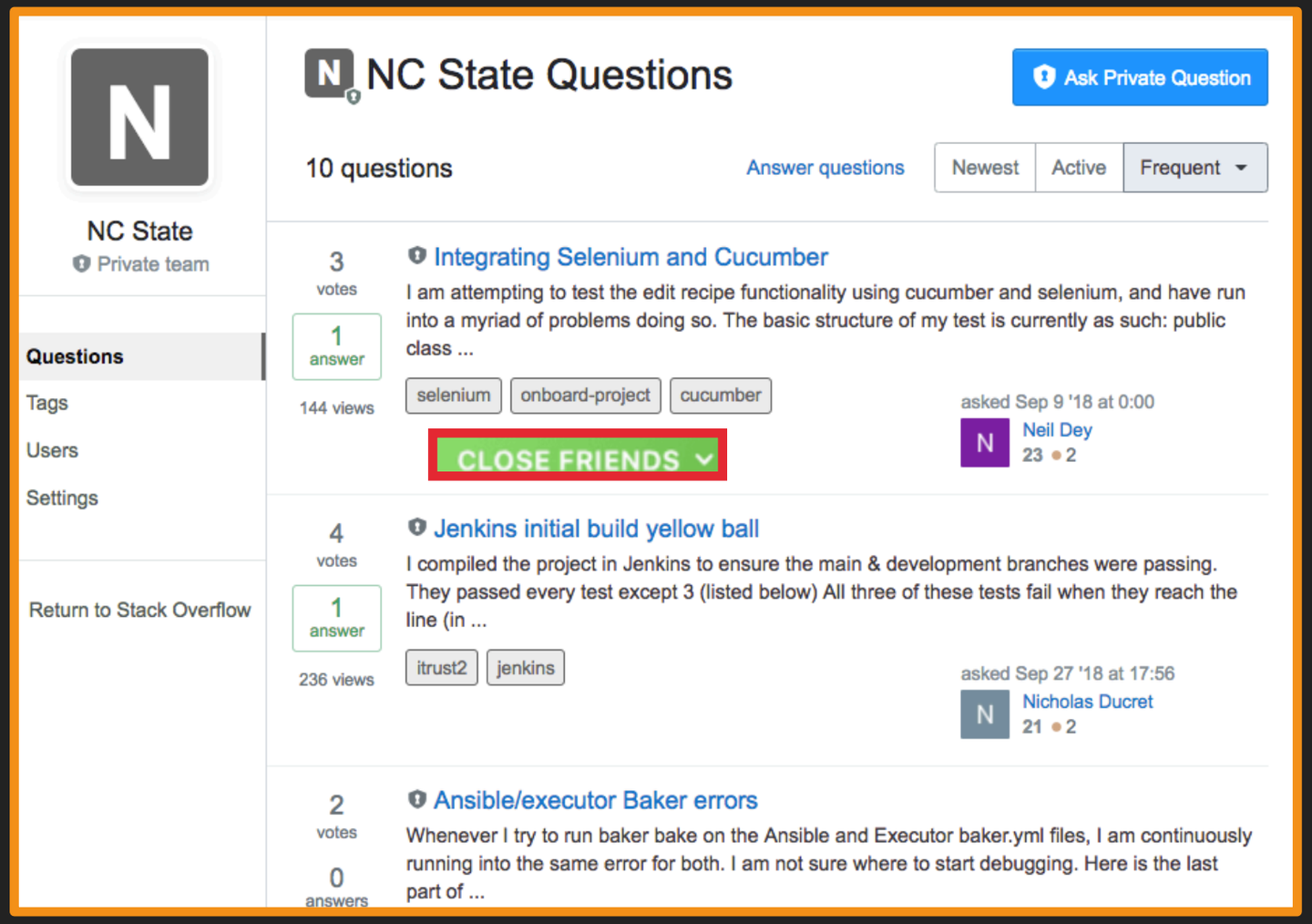

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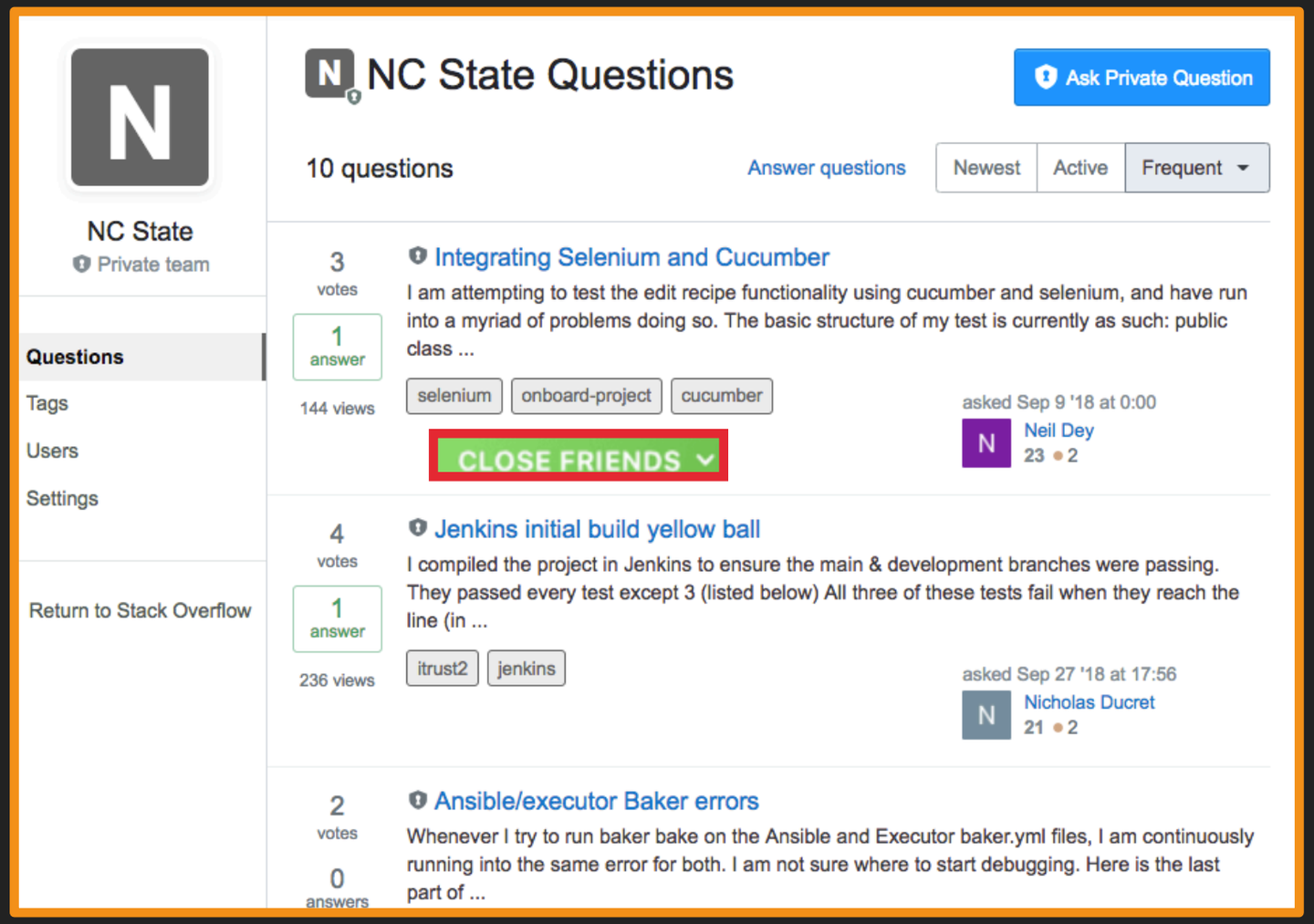
How does asking change when audience is specialized?

How does *segmented* anonymity become more helpful in these spaces?



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How does asking change when audience is specialized?

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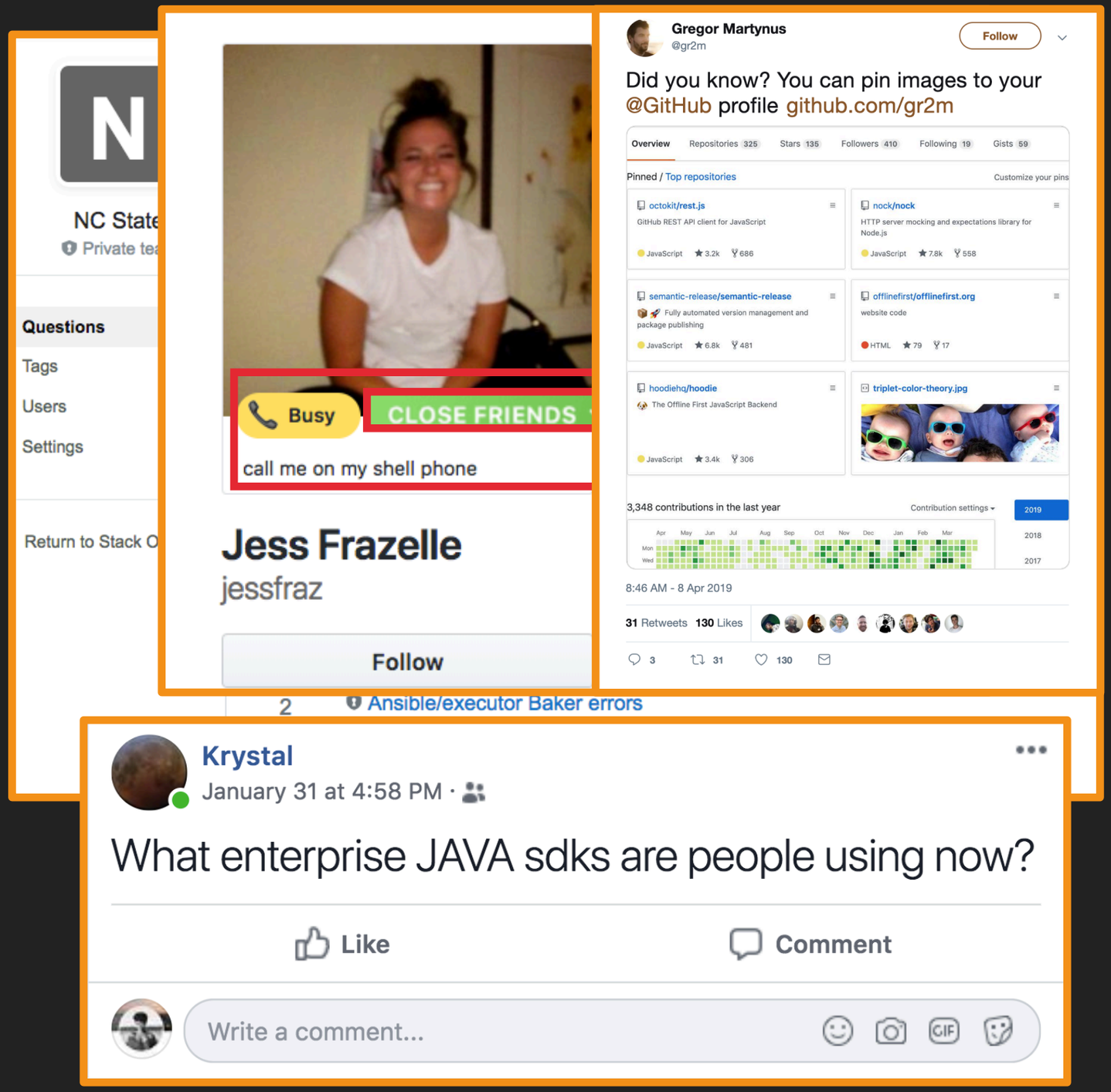
How do we manage context collapse across platform?



3. HOW DO WE EMPOWER MARGINALIZED PROGRAMMERS IN VIRTUAL TECH SPACES?

#ILookLikeAnEngineer

[CSCW 2018]

3. HOW DO WE EMPOWER MARGINALIZED PROGRAMMERS IN VIRTUAL TECH SPACES?

[CSCW 2018]

Where are they seeking technical help?

3. HOW DO WE EMPOWER MARGINALIZED PROGRAMMERS IN VIRTUAL TECH SPACES?

[CSCW 2018]

AskQuestions.Tech

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About AskQuestions.Tech

The inclusive place to ask tech questions.

RStudio Community

Always Be Civil

Nothing sabotages a healthy conversation like rudeness:

Get live help!

Start private chat

How do I use this?

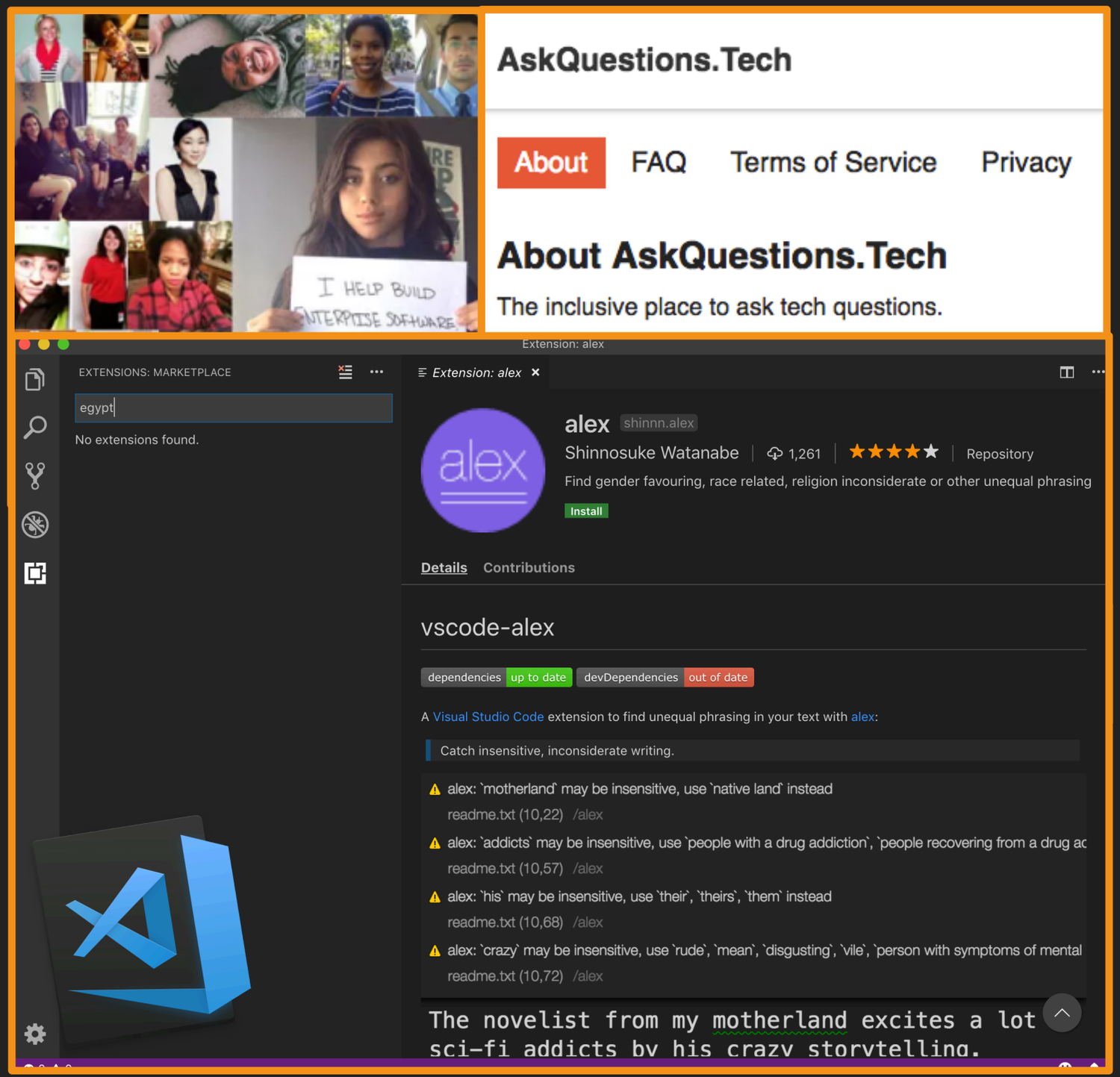
These Python Tutor users are asking for help right now. Please volunteer to help!

- user_ae5 from Denver, Colorado, US needs help with Python3 - 2 people chatting - **click to help**
- user_3b9 from Valencia, Spain needs help with Python3 - 2 people chatting - **click to help** (active
- user_38b from Youngstown, Ohio, US needs help with Python3 - 2 people chatting - **click to help**
- user_794 from Charlotte, North Carolina, US needs help with Python3 - click to help (IDLE: last activ
- user_856 from Lorton, Virginia, US needs help with Python3 - click to help (IDLE: last active 11 minute

Where are they seeking technical help?

How can we make our communities more like those spaces?

3. HOW DO WE EMPOWER MARGINALIZED PROGRAMMERS IN VIRTUAL TECH SPACES?



Where are they seeking technical help?

How can we make our communities more like those spaces?

How can we encourage programmers to build these types of platforms?

SUMMARY

Online Q&A communities are widely used, but present barriers of unfamiliar norms can leave programmers, specifically novices and women discouraged from participating.

[FSE 2016]

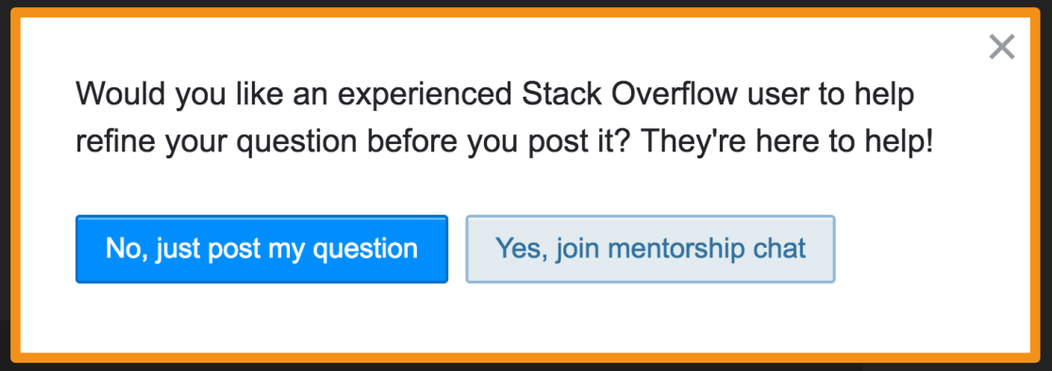
Just-in-time mentoring provided novices with help to ask a well-received question, precisely when they needed it.

[CHI 2018]

Vision: How can we empower, connect, and give control back to the users by constructing participation around identity signals ?

http://denaeford.me

denae_ford@ncsu.edu



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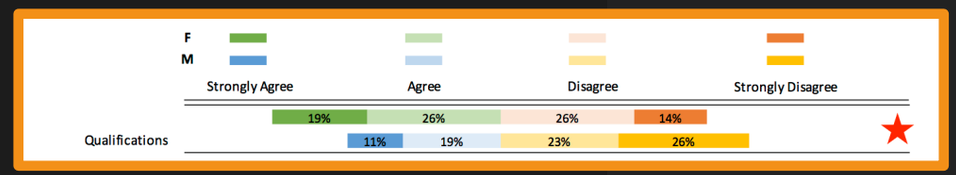

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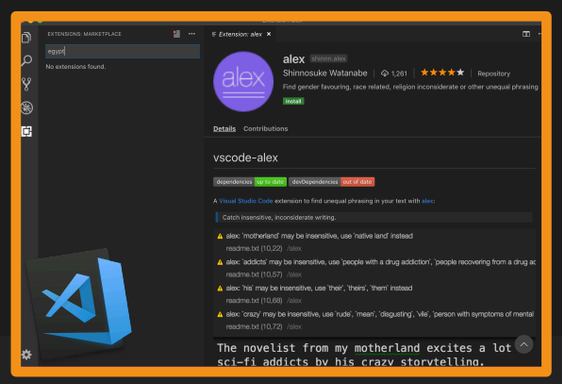
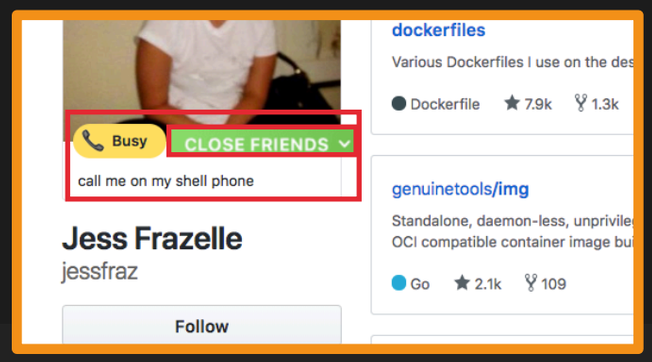
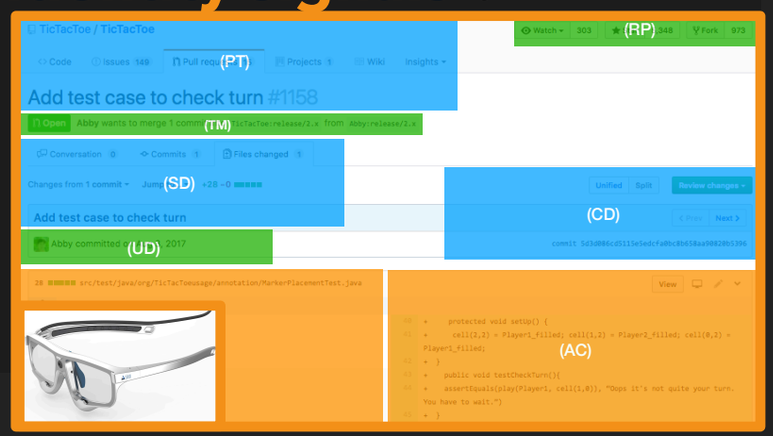






Microsoft Research

THE NATIONAL GEM CONSORTIUM

alt-code

NSF

NC STATE UNIVERSITY

++

An Online Programming Community (OPC) is….

Any virtual space where people come together with others to converse, exchange information or other resources, learn, play or just be with each other in the context of programming

[derived from Kraut 2012]

An ecosystem due to many types of members, how their actions can effect each other, and how they develop niches.

[Herbsleb 2014]

Benefits include the ability to learn more about programming while contributing to the code of others.

[Stack Overflow 2016, Zlotnick 2017]

TARGET A FEW

HELP MANY

BARRIERS BY FACTORS

Wilcoxon Rank Sum Test

$\alpha = .05$; $\alpha = 0.0012$ with Bonferroni Correction

ACCOUNT ACTIVITY

HAS ACCOUNTS VS. NOT

(n = 1003, n = 467)

Awareness of Features

Stranger Discomfort

Intimidating Community Size

Fear of Contributing to the Clutter

Posting is Hard, Friends are Easy

Qualifications

Onboarding Hoops

EXPERIENCE

FULL TIME DEV VS. NOT

(n = 1003, n = 467)

Qualifications

Time Constraints

Paired Guidance

Mellie

Why aren't my arrays showing updates?

tags: javascript

Hello, can you please help?

```
if (x) {
    print ("hello world!")
};
```

edit copy draft back to Stack Overflow

Hey @Mellie , thanks for coming. :) This is the Stack Overflow chat room we're using to help people improve their questions. This message is automated but everything else is real! Before we start: do you have any particular concerns, or are you just double-checking before you post?

Olivia

Hey there @Mellie ! I'm here to help you with your question. Gimme a sec while I read over it.

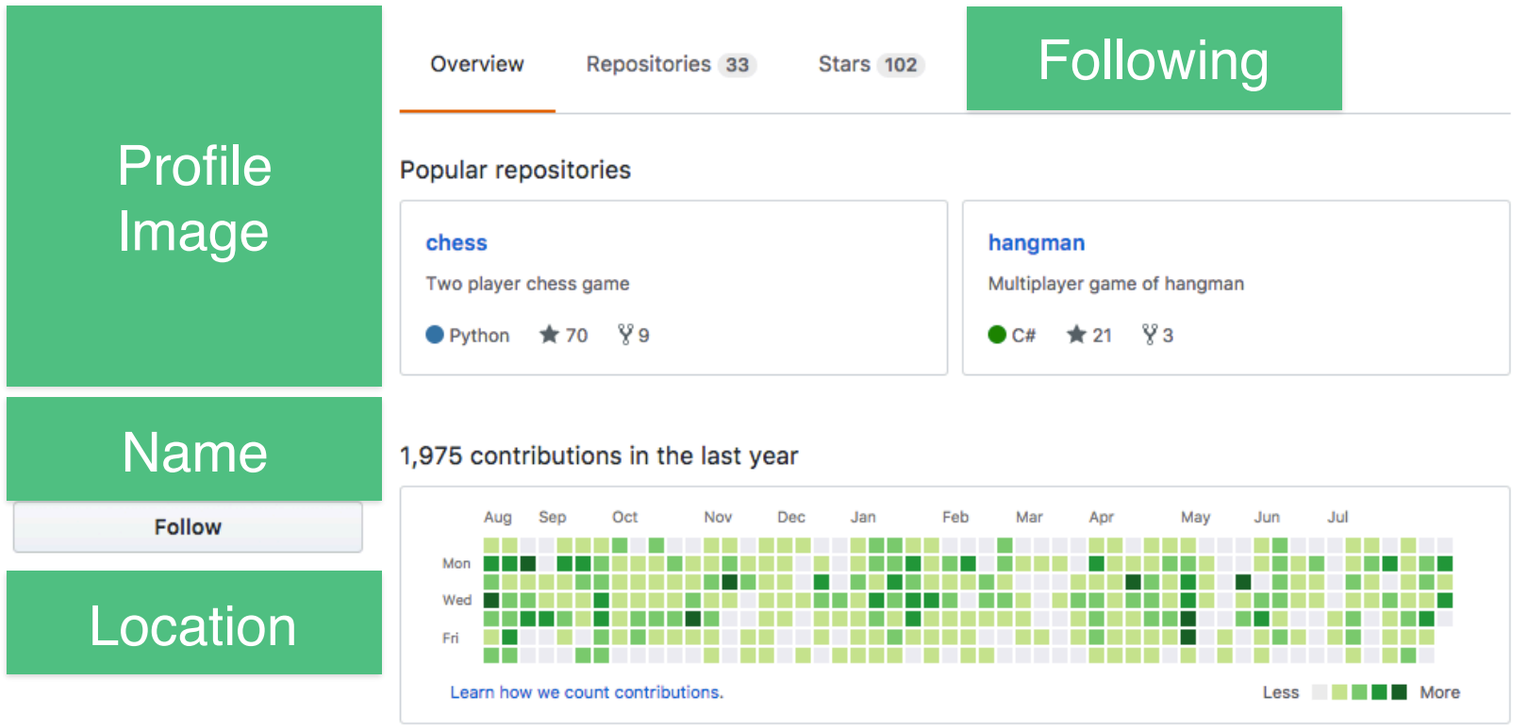
Mentor-mentee pairing based on peer identification

Why Stack Overflow?

Alternatives exists(AllAnswered, Software Engineering Stack Exchange, Hacker News, Twitter, r/programming) but lack the following:

- Popularity with **8,338,956 users**
- Public access to data
- Accessibility to answers
- Breath of topics

Why GitHub?



A Github account is the calling card of the software developer.

Just as any writer would be asked to show their blog, every developer is expected to produce examples of their code on Github.

In 2017, the GitHub community reached **24 million** users working across **67 million repositories**.

PARTICIPANTS ARE SATISFIED WITH THEIR INTERACTIONS.

Likert Statement	Median
I feel that I am a part of the Stack Overflow community.	4
I feel more comfortable posting on Stack Overflow.	4
The help that I received from this program was useful to me.	5
I would recommend this program to other SO users.	5
I would like to participate in this program again.	5

"**If we can get the [original poster] through the first question with a positive experience** and they can see how this site really works, then we should get more good questions which feeds in to having more good answers." (Mentor)

NOVICES **SATISFIED** WITH THEIR EXPERIENCE

MENTORS **INTERESTED** IN OFFERING GUIDANCE

[CHI 2018]

RESULTS

ON-RAMP ROADBLOCKS

Abstraction Process

Time Constraints

Qualifications

Onboarding Hoops

Research Pressure

IMPERSONAL INTERACTIONS

Fear of Negative Feedback

Stranger Discomfort

Intimidating Community Size

Posting Is Hard, Friends Are Easy

MUDDY LENS PERSPECTIVE

Awareness of Site Features

Nothing Left To Answer

Fear of Contributing to Clutter

No “Good-Answer” Guarantee

Perception of Slacking

[FSE 2016]