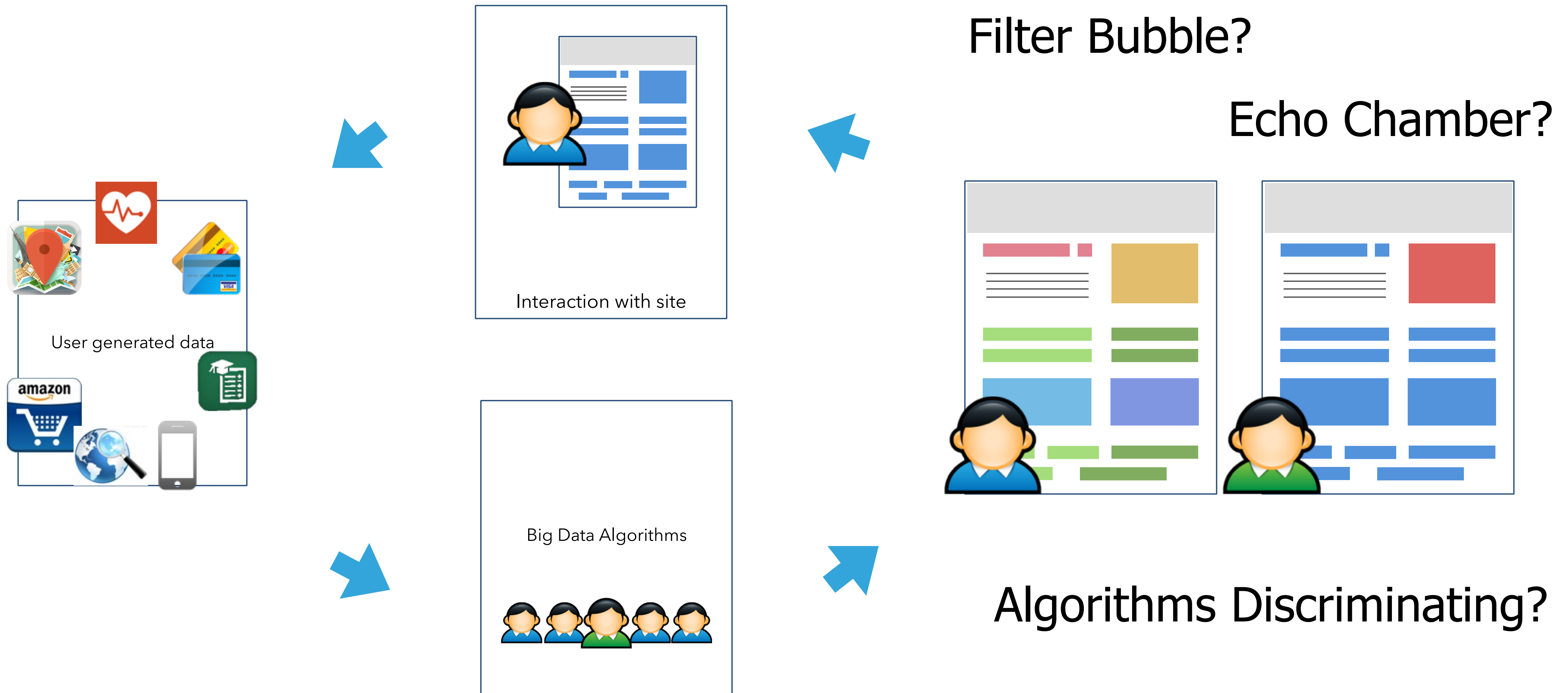


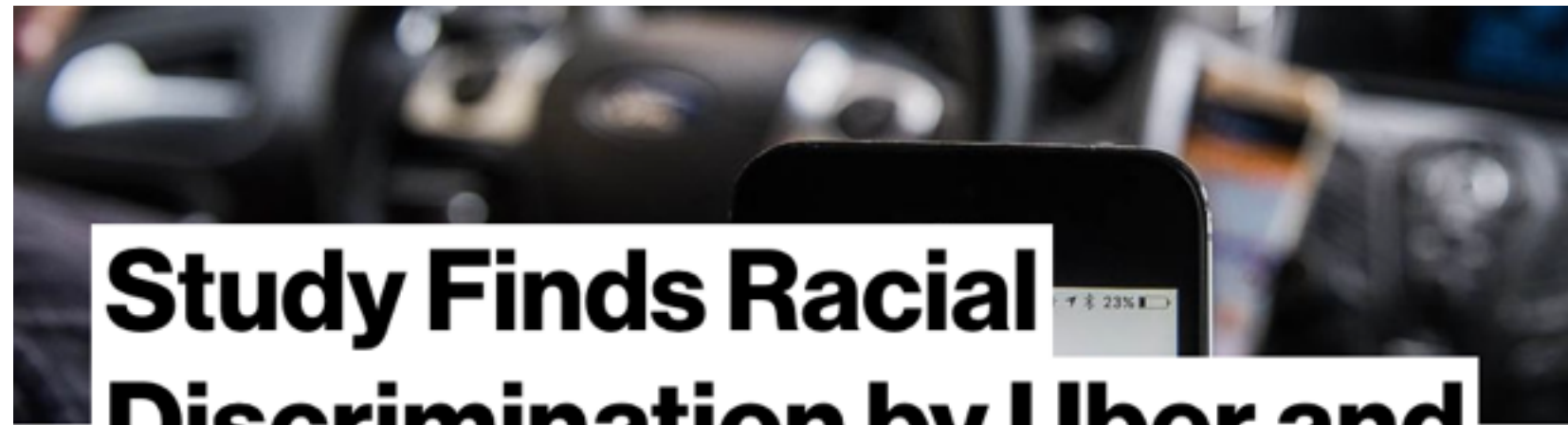
# New Faces of Bias in Online Labor Markets

Aniko Hannak  
Central European University

# Brave New Online World



# Algorithms & Discrimination



## Study Finds Racial Discrimination by Uber and Lyft Drivers

Researchers suggest anonymity as a possible solution.

Study: Uber and Lyft have 'pattern of discrimination' against black passengers

Waiting times for black Seattle passengers were 35% longer, and Boston drivers cancelled rides for black passengers more than twice as frequently, study found



## Study Finds Racial Discrimination by Airbnb Hosts

The New York Times

## Does Airbnb Enable Racism?

## Can the algorithm police use to predict crimes be racist?

Even algorithms are biased against black men

A study on offenders in Florida refutes the notion that computers are more objective than people



The Intersect

Google's algorithm shows prestigious job ads to men, but not to women. Here's why that should worry you.

## Facebook charged with racism in job and housing ads

# Online Labor Markets



The Internet is fundamentally changing the labor economy

Job Search: Millions of people use online hiring sites to find employment

Freelancing: In 2014, 53m people, 34% of total workforce in US

Policymaking has to catch up and protect employees online

So much simpler than Yellow Pages

Easy access to job opportunities, information

Equality: access to the same information independent from class, location

# Goals of my Work

Observe biases known to occur in the real world in online platforms

identify mechanisms that bring the inequality into the system

(e.g.: selection of workers, reviewing them)

examine algorithms that retain, reinforce them

(e.g.: recommendation, search)

quantify the extent to which minority groups are affected

Come up with mitigation strategies, design recommendations

# OUTLINE

1. Freelance Marketplaces
  2. Online Professional Communities
  3. Job Search Sites / Resume Search services
- Conclusion

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# Search

 **Event Planning**

SORTED BY:  
Recommended





**Matthew P.** \$50/hr

✓ No Event Planning related tasks completed.  
👍 No Event Planning related reviews.

**How I can help:**  
I've planned dinners and retreats for 50+ people in the past. Expect the plan to be well detailed. Let me know if I can help.

[Select & Continue](#)  
[Reviews & Profile](#)

  
*"Matthew was fantastic! He showed up early and prepared. We had to put together a very large wardrobe and he had already taken a look at the piece online so he knew what he was getting into. It was a hard job, but when he told us he was a structural ..."*  
- November 18, 2015





**John G.** \$45/hr

✓ 1 Completed Event Planning Task  
👍 1 Event Planning Review: 100% Positive

**How I can help:**  
I have over 15 years in the event production and planning industry. Since college I have booked entertainment, produced shows, researched venues, managed caterers, tent vendors and other special event services. And I am well connected in the business.

[Select & Continue](#)  
[Reviews & Profile](#)

  
*"John was extremely responsive and communicative. He was excellent to work with and really helped my company out! I highly recommend John."*  
- June 06, 2015




**DIANE H.** \$125/hr

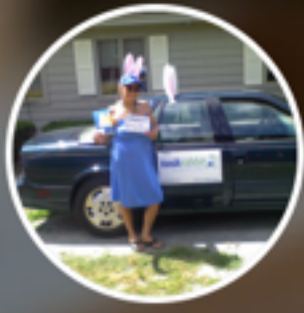
✓ 1 Completed Event Planning Task  
👍 1 Event Planning Review: 100% Positive

**How I can help:**  
I am very good at motivating workers to get the event done with out any hip cups. I have planned and ran a staff up to 100 workers , no event is to big or small. I also stay with in your budget.

[Select & Continue](#)  
[Reviews & Profile](#)

  
*"Diane did a wonderful job in the kitchen - always a joy to work with!"*  
- December 07, 2011

# Profile Information



Hello, I'm **DIANE H.**

Last online: This morning

👍 99% positive rating  
Facebook and ID Verified

✓ I've done **353 tasks.**  
I've been a Tasker since **2010.**

📍 Working in Boston  
I have a **Car** if you need one.

## Why I'm your Tasker:

### I'm the right person for the job...

I have been one of TaskRabbit's Runners for over 5 years. i have excellent reviews. I give a 100% to every job i am assigned. There are a couple of negative reviews you might see. The 1st task he is not complaining about the work I did. The 2nd task i have no idea why she gave me a thumbs down.

### When I'm not tasking...

I work for the new England Patriots and several other Arenas in the area. I enjoy spending time with my Family. I also volunteer for The Moose Fraternity raising money for Children and Seniors



#### Cleaning:

Diane is great at communicating and getting the job done! Will hire again for sure!!  
Rachel G., November 17, 2015



#### Cleaning:

Rachel G., November 10, 2015



#### Organization:

Diane is fantastic! We've hired her multiple times, all great experiences.  
Jessica S., November 04, 2015



# Data



**TaskRabbit**

User features

Age, Education, Bio, Verified, Elite, etc

How do demographic features relate to social feedback or position on the search result page?



small online tasks

75k profiles (~50%)

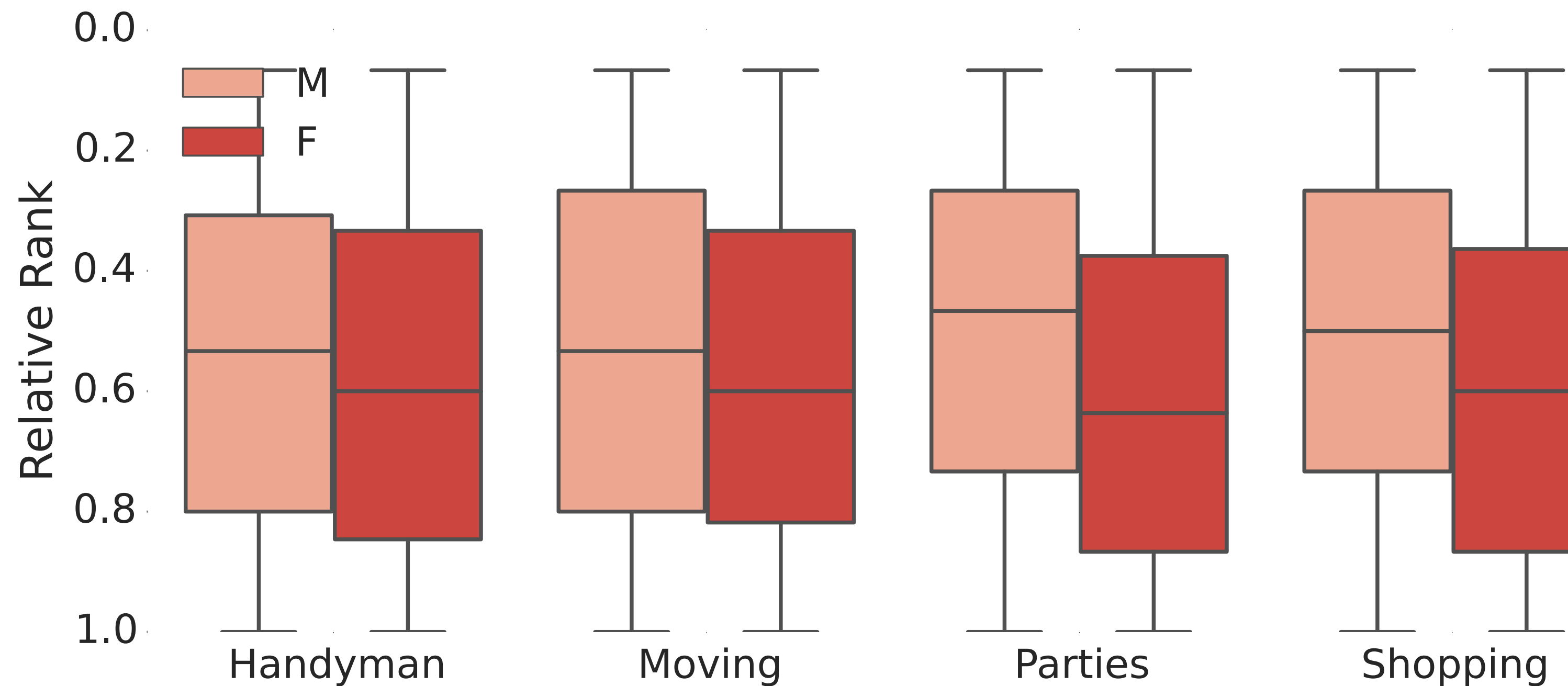
Search results

position of each user in the result list of a given query

# Bias in Search Results

TaskRabbit

Rank 0 denotes the top of the page



# Fairness in Search Results

OLS regression, dependent variable: **User's Position in the Search Results**

Black workers rank lower than white workers  
Being a man is worse for black workers

|                          |                  |
|--------------------------|------------------|
| <b>Female (Ref:male)</b> | <b>-0.468***</b> |
| <b>Asian (Ref:white)</b> | <b>0.194*</b>    |
| <b>Black (Ref:white)</b> | <b>-0.428***</b> |
| <b>Asian*Female</b>      | <b>0.364*</b>    |
| <b>Black*Female</b>      | <b>1.3***</b>    |

\*p < 0.05; \*\*p < 0.01; \*\*\*p < 0.001

# Social Feedback



We find racial and gender-based differences in

- number of reviews
- ratio of tasks evaluated
- rating score
- language of the reviews

Extent and type of inequality varies based on the site or type of job

Open questions: self-selection process, drop-out rates

# OUTLINE

1. Freelance Marketplaces

**2. Online Professional Communities**

3. Job Search Sites / Resume Search services

Conclusion

# Investment and reputation

Online professional communities combine “community” with “reputation”

e.g.: designers (Dribbble), software developers (GitHub), etc  
effectively the online representation of a career

Building online identities and trust are a long-term investment

reputation, trust

customer base, history

social ties, visibility, audience



Dribbble (yes, 3 b's!)



Dropbox



Google



Evernote Design

Shots (60k)

Users (5k)

Teams (1000)

Invitation Email Template  
by Zsófia Czémán on Apr 11, 2016

Views, likes, responses

Like? 22 likes  
Share 1,413 views  
Bucket 5 buckets  
Rebound

More from Zsófia Czémán

Tags: confirmation mail, e-mail design, email template, icon, invitation mail, mail ui

1 Response  
Roland Hidvegi: But big! Really nice work! I love the circular too. 9 months ago | Reply | Delete | Like?

Add a new comment

Shots 17 Followers 29 More

PRO

Zsófia Czémán  
Budapest & Berlin  
Digital Product Designer | UX / UI | Illustration | Branding

Hire Me

followers

43 0 10 | 303 2 17 | 98 0 7

Shots 314 Followers 25,925 More

TEAM

Dropbox  
SF, NY  
Simplifying the way people work together  
Join us! dropbox.com/jobs/design

Following

followers

MEMBERS

5,187 5 349 | 9,424 8 344

# Differences in Success

median (mean)

**# of Views**

**# of Likes**

**# of Responses**

**Women**

1539 (759)

72 (40)

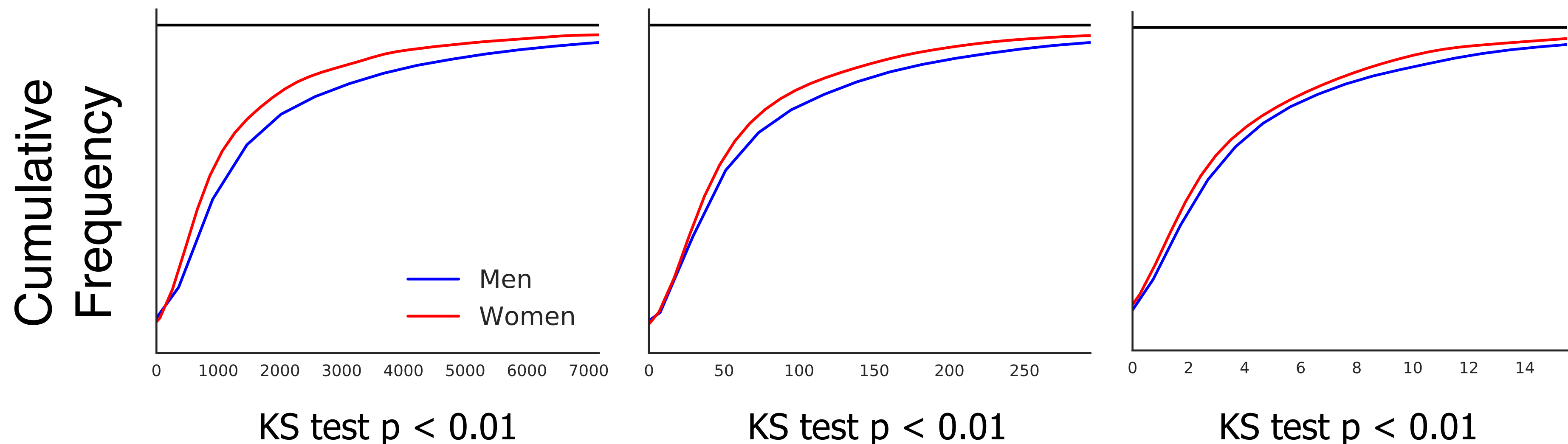
4.1 (2)

**Men**

2181 (1008)

89 (44)

4.7 (2.5)





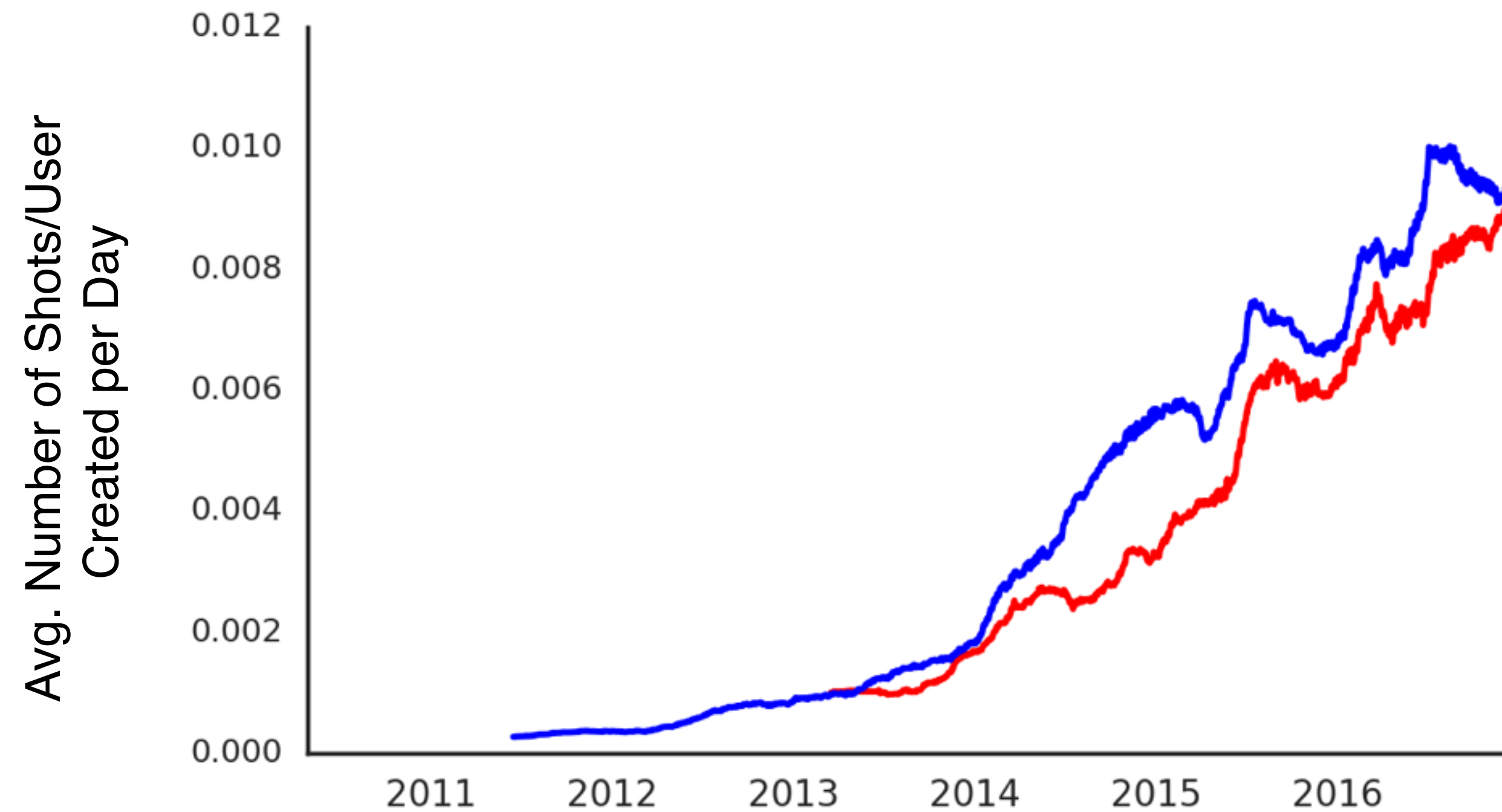
# Explaining differences

What leads to success on Dribbble? Why the differences?

1. Experience, productivity, tenure?
2. "Genderedness" of skills and designed products?
3. Difference in social network positions?

# 1. Experience, productivity, tenure

Gender-based differences exist

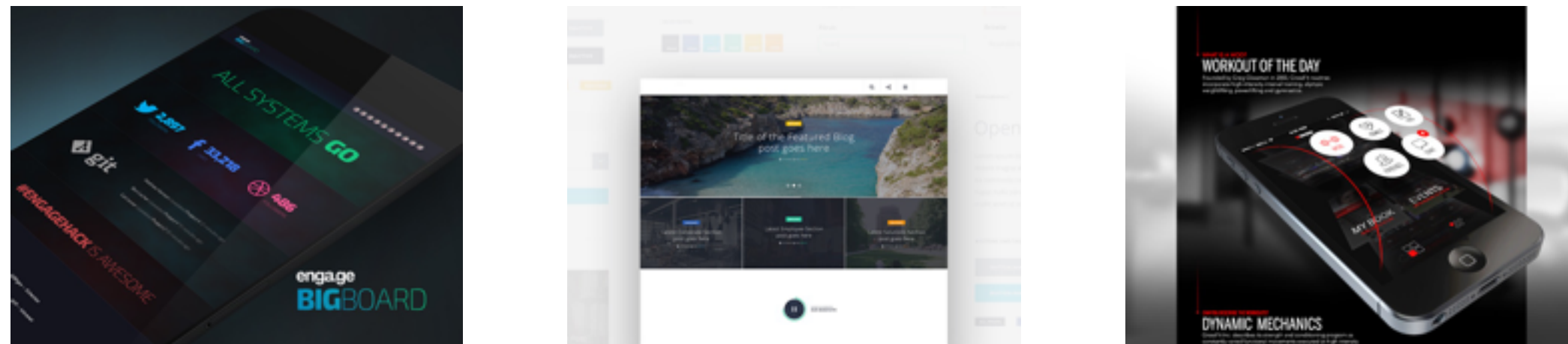


But gender is still significant if we control for them.

## 2. "Genderedness" of skills and products

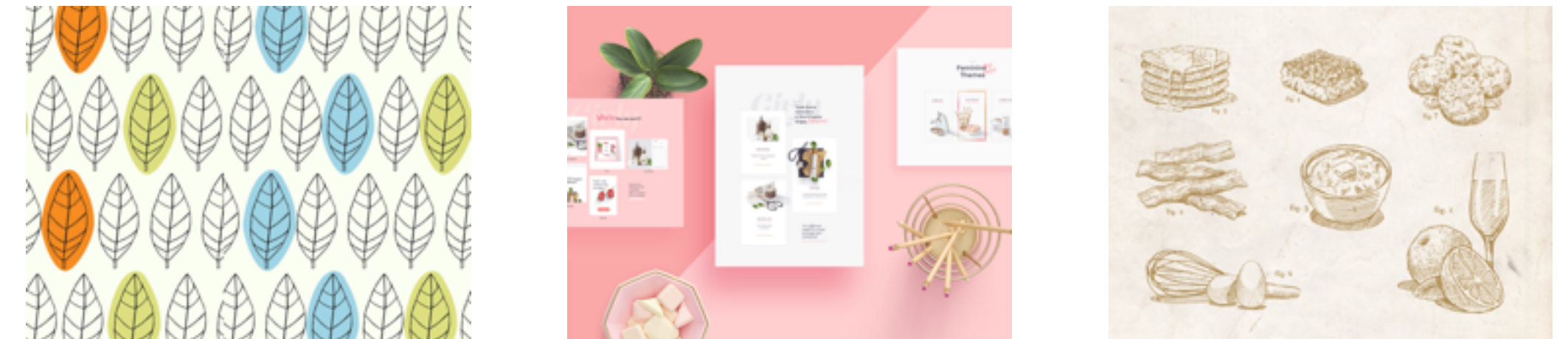
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Interfaces, Product Management Objective C, iOS dev



---

Calligraphy, Copy Writing, Research, Hand Lettering



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Genderedness explains some of the gender effects

But not good enough at explaining success ( $R^2 < 0.14$ )

# 3. Difference in Social Network Position

Adding **follower count, reciprocity, and ego density** to the OLS regression

$R^2$  value increases from 0.1 to 0.6

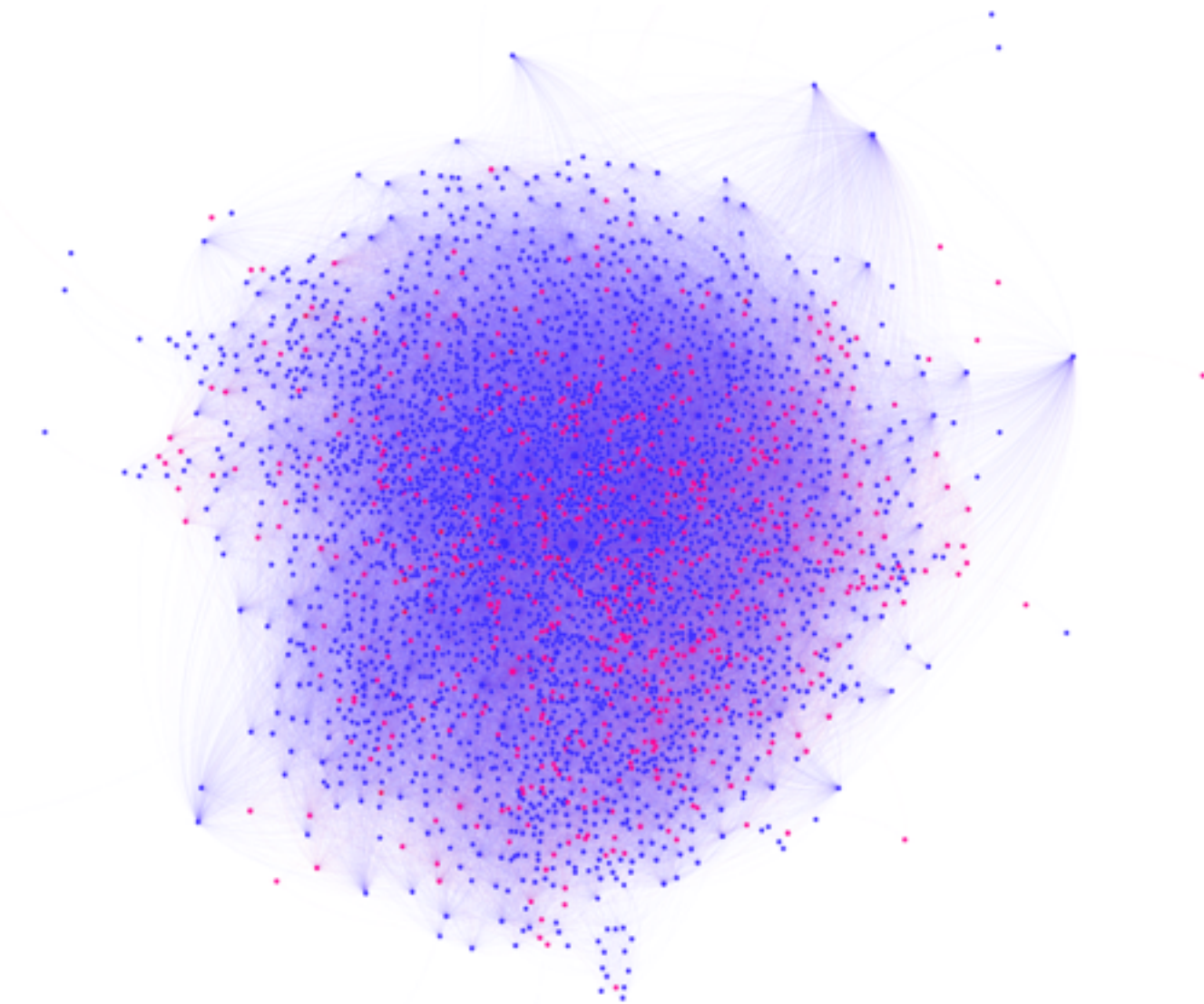
# of followers and ego network density predict success

Gender is no longer significant

## ERGM

Men have more followers, less reciprocal ties: **bigger audience**

Women have more reciprocal ties, smaller clusters: **stronger ties**



# OUTLINE

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# Job Search Sites



Job Search sites are actually tools for recruiters to find candidates

Danger of Bias: Search Algorithm allows to filter based on many individual user characteristics

Collected data from 3 job search sites

Are there differences the positions of candidates in the results list based on race/gender?

Can we develop an algorithm that is “similar enough” to the ones on the site but does not take gender into account?

# Discussion

New mechanisms for inequalities to emerge

Require new measurement techniques to detect and quantify them

Open questions, next steps:

How to mitigate inequalities? Transparency? Fair algorithms?

Accountability?

Whose responsibility is it?

How to regulate if the offline policies do not apply online?

# Thank you!

[personalization.ccs.neu.edu](http://personalization.ccs.neu.edu)

[ccs.neu.edu/home/ancsaaa](http://ccs.neu.edu/home/ancsaaa)

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