



Strong and Weak

CS 278 | Stanford University | Michael Bernstein

Last time: growing pains

Communities can't maintain the same design as they grow. Newcomers change the dynamics, even if they absorb the norms — and oftentimes they don't absorb the norms.

Invisible labor: the hidden work that moderators do to make these systems survive a rush of new members

Attention underprovision: people cluster their feedback on a smaller proportion of the content as the system grows

Growth begets regulation and moderation, which pushes off newcomers

Where we are, and where we're going

Week 1-2: Basic ingredients

Week 2-3: Creating systems and growing them

Starting now: Groups small and large

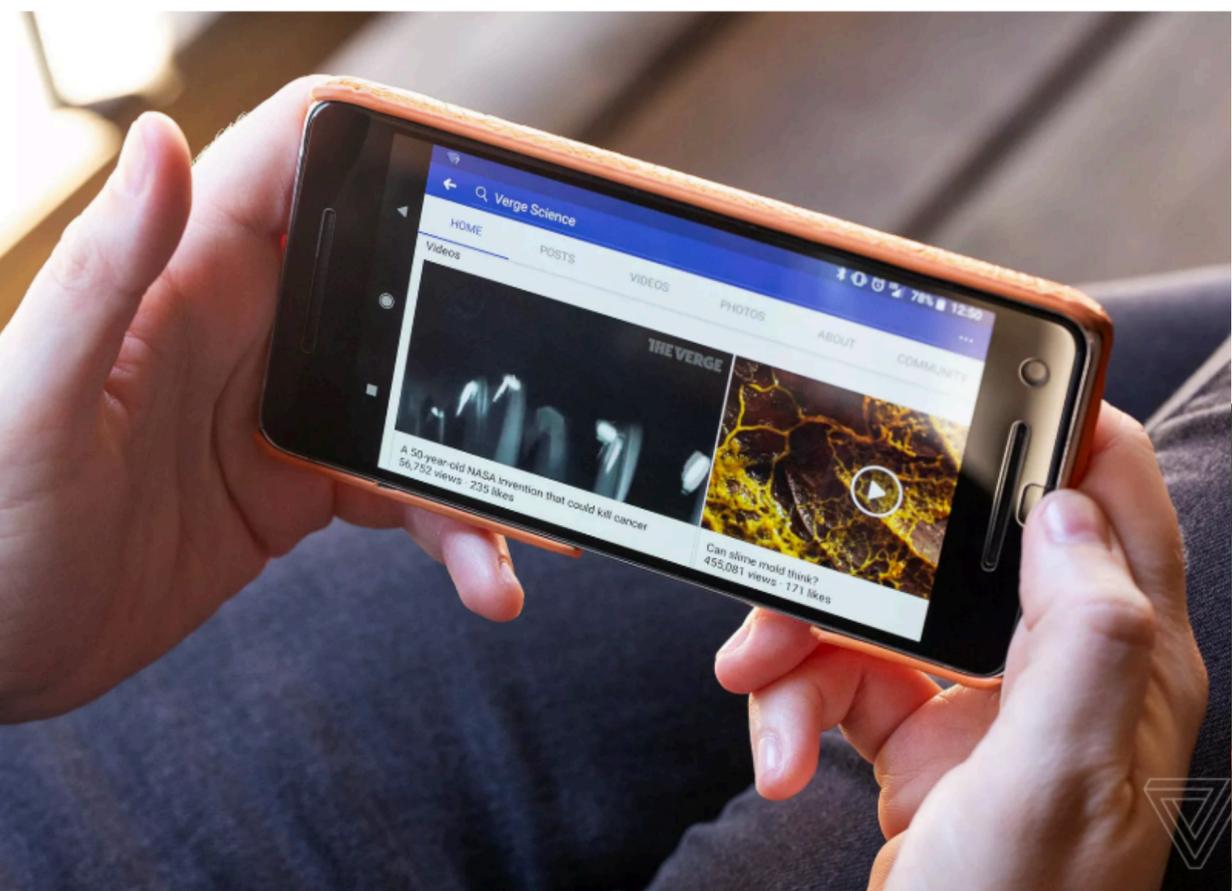
- Designing for strong and weak ties

- Team collaboration systems

There's more evidence Facebook can make you feel lonely

What a new study tells us about social networks

By Casey Newton | @CaseyNewton | Nov 13, 2018, 6:00am EST



SOCIAL | FACEBOOK | TWITTER

The Difference Between Facebook and Twitter: Twitter Is Lonely for New Users

Twitter isn't the most welcoming place on the Internet.

By Kurt Wagner | Feb 11, 2016, 12:40pm EST



Can You Be Lonely In An MMO?

By Lewis Burnell on August 01, 2016 | Columns



For the first time in a long time, I find myself without... in Guild Wars 2 before taking a break from the game... simply because no one wanted to talk. The majority... accompanied by long-standing friends and we've... a group. Their time in Black Desert Online was spent... a collection of issues saw them leave in their dro...

Do social computing systems make us lonely?

Internet Paradox

A Social Technology That Reduces Social Involvement

and Psychological Well-Being?

Robert Kraut, Michael Patterson, Vicki Lundmark, Sara Kiesler, Tridas Mukopadhyay, and William Scherlis
Carnegie Mellon University

Do social computing systems make us lonely?

No.

Well, yes.

It depends on how you use it.

WhatsApp group chat



Why do these feel different?

Dorm email list

- [kimball2005-chat] FS: Laptop power adaptor-- autos ar
 - [kimball2005-chat] Cake outside door - Rm. 111 =) Victo
 - [kimball2005-chat] FS: External DVD burner \$90 - Come
 - [kimball2005-chat] dolley? - Anyone have one that I can
 - [kimball2005-chat] WTB: Dell Battery Pack - Hey guys, A
 - [kimball2005-chat] packaging tape - Can I have somebo
 - [kimball2005-chat] anyone have bubble wrap? - Does ar
 - [kimball2005-chat] Packing Peanuts!!! FREE - Need som
 - [kimball2005-chat] 4 commencement tix available - Roc
 - [kimball2005-chat] fridge for sale - Haier fridge <http://w>
 - [kimball2005-chat] commencement ticket taken
- (Michael's actual senior year dorm list)

Tie Strength

[Granovetter 1983]

Not all of our relationships are the same.

Some are **strong ties**: trusted friends and family.

Others are **weak ties**: rough acquaintances.

Michael's claim: social computing systems must design for each of these groups differently.

Today



Strong ties



What are we designing for when we design for strong ties?

Think:

Your BFF

Your roommate

Your mom

Strong ties typically have **thick offline context**. This means that the social computing system will never see everything about the relationship.

Who are our strong ties?

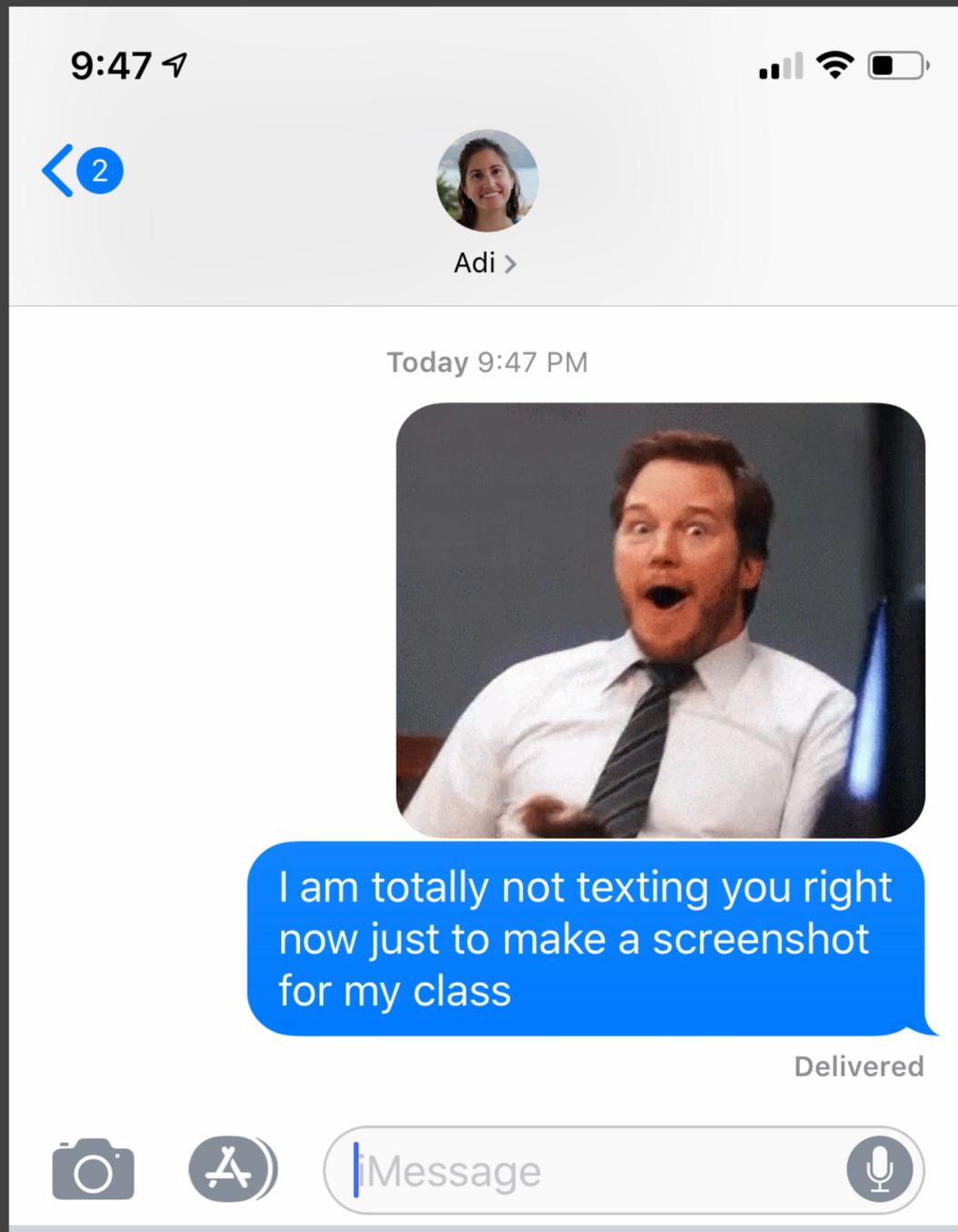
Strong ties are typically in the social networks that we are already deeply embedded in. [Granovetter 1983]

Strong ties provide social and emotional support that improve mental health. [Schaefer et al. 1990]

Strong ties communicate with us through multiple channels, rather than through a single widely-available channel (e.g., email).

[Haythornthwaite 2002]

Designs for strong ties



Often, the design goal is to maintain or deepen the strong tie relationship.
Other examples?

Why does this work?

Why do designs for strong ties succeed at their goal?

Why don't other social computing systems (e.g., Twitter) seem quite so good at it?

What's the secret?

[2min]

Honest Signals

[Donath 2007; Pentland 2010; Smith and Harper 2003]

In social situations, it's easy and quick to throw out perfunctory signals that you care about someone.

“We should grab coffee!” [Your Flaky Friend 2019]

However, other signals are much more **costly** to produce, and so they are more **honest**.

In nature: peacocks have amazing plumage because there is no way to fake having the nutritional resources to waste on them.

In social life: spending time on something for someone matters.

Strong tie systems as honest signals

Michael's claim: what makes designs effective at maintaining and deepening strong ties is that they operate as honest signals: that *I cannot fake the attention and effort* I am putting into our interactions.

I respond to the text...or I don't.

I FaceTime you...or I don't.

I send you silly emails...or I don't.

Weak ties



What are we designing for when we design for weak ties?

Think:

That person you kind of remember from your freshman dorm

Someone on the team that you interned with last summer but haven't kept in close touch with

Acquaintances you see occasionally

Weak ties typically have **thin context** because they interact more sparsely. It's much more likely that WYSIWYG for the system.

Who are our weak ties?

Weak ties often represent connections to parts of the social network that we do not inhabit. [Granovetter 1983]

People with weak ties to other organizational units in a company tend to have higher performance reviews and generate more creative ideas. [Burt 2004]

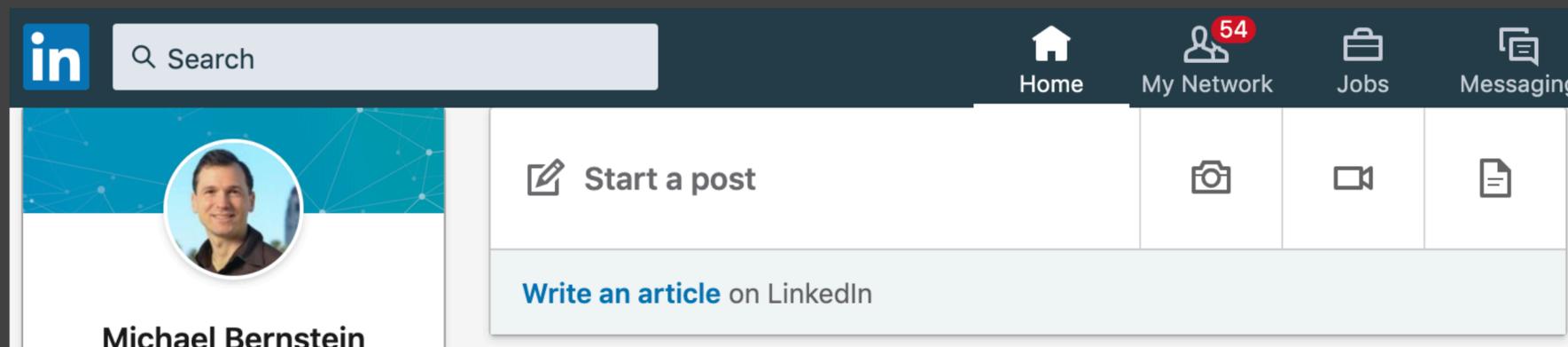
Weak ties often communicate through a single commonly-available channel (e.g., email, Facebook), rather than a multiplicity of channels. [Haythornthwaite and Wellman 1998]

Designs for weak ties



A screenshot of a Facebook post by Marty Stepp, posted 12 hours ago. The post text reads: "Hey, Stanford undergrads! We are hiring new section leaders to start in fall 2019. Come be a section leader, be part of a great team, and help make a difference. Check it out and pass it on." Below the text is a separator line and another paragraph: "We are now accepting applications for CS106 section leaders for Fall 2019! To apply, you must be currently enrolled in, have completed, or have equivalent experience to CS106B/X.... [See More](#)". The post has 32 reactions (likes, loves, wow) and 5 comments and 1 share.

Design goals with weak ties are often: Keeping tabs. Celebration. Social movements. Broadcast. Other examples?



A screenshot of the LinkedIn homepage for user Michael Bernstein. The top navigation bar includes the LinkedIn logo, a search bar, and icons for Home, My Network (with 54 notifications), Jobs, and Messaging. The main content area features a "Start a post" button with icons for text, image, video, and document, and a "Write an article on LinkedIn" link.

The strength of weak ties

[Granovetter 1983]

Because weak ties are connected to parts of the network that we cannot access, they are valuable sources of new perspectives and professional opportunities: people find new jobs through weak ties.

Recent work has tested this using Facebook log data, finding that...

While most people are helped through one of numerous weak ties, a single strong tie is still much more valuable at the margin.

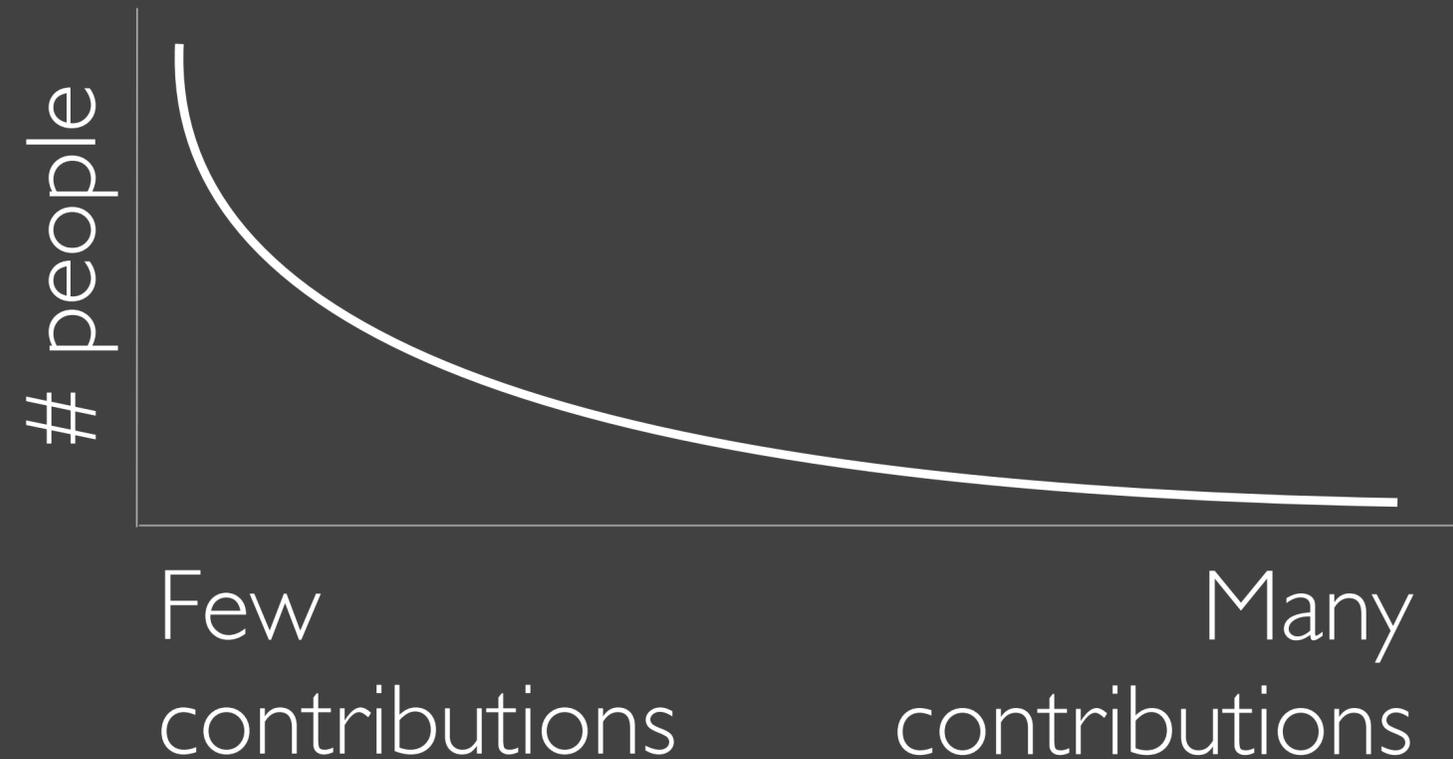
[Gee et al. 2017]

In other words, we are much more likely to go where our strong ties are, but we have many more weak ties than strong ties.

The Weak Shall Inherit

In nearly every social system, there will be extreme inequality (\approx power law distribution) in contribution volume.

This means that most of the content you see on Facebook/Twitter/dorm lists is from a small proportion of the people who are on it.

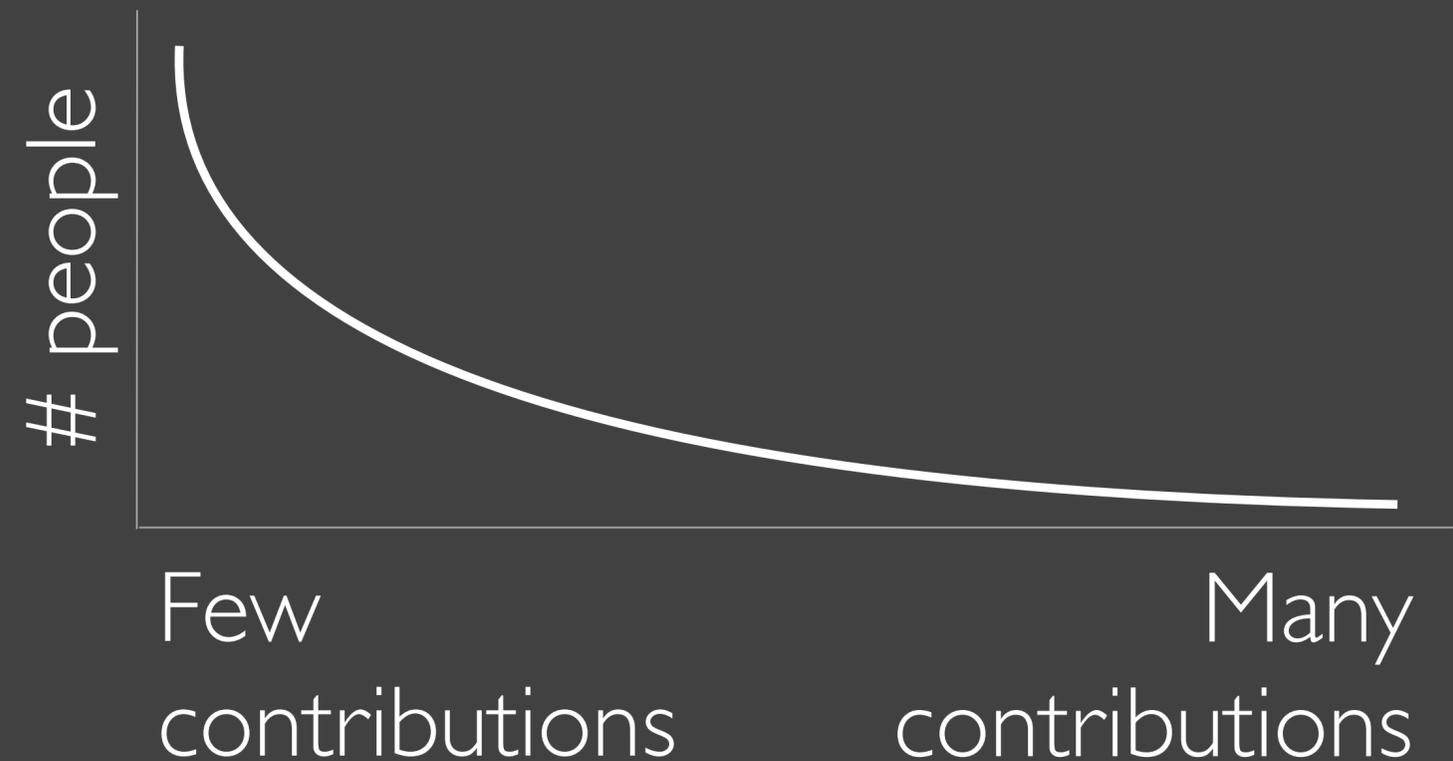


The Weak Shall Inherit

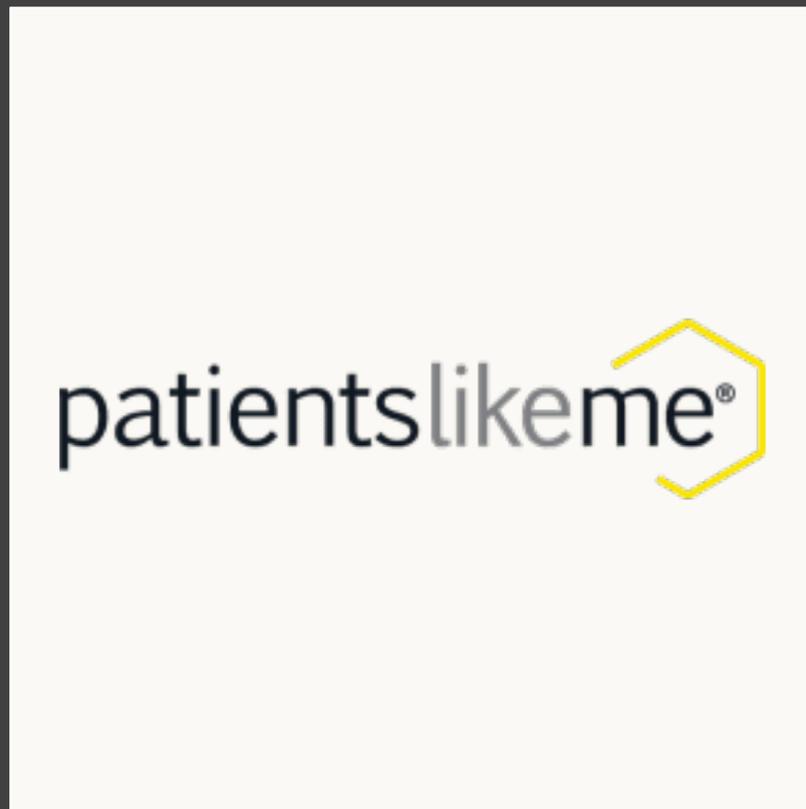
So, chances are, most of the content you see on social computing platforms is from your weak ties.

Design challenge: how do you make content from people you barely know worthwhile?

If you are an RA, how do you make the dorm community feel connected even if only a small percentage are actively contributing?



What about no ties?



At least initially, the members of these systems may not know each other at all. Is the goal of the system to build tie strength? Or something else? [1 min]

Bond- vs. identity-based groups

[Ren, Kraut, and Kiesler 2007]

Many social computing systems are formed around people who (initially) share no ties at all. These groups are often bound together by a shared **identity**, for example women in CS, or Warriors fans.

In contrast, Facebook is more oriented around **bonds**, or ties.

Design the social computing system as relevant for the kind of group you are drawing together.

Designing for identity-based groups

Highlighting the group's unique identity increases commitment
[Ren, Kraut, and Kiesler 2012]

How can you let people express that shared identity?

Sharing content, stories, etc.

Examples: subreddits, mailing lists, forums

Tie strength in action

How tie strength plays out dynamically in social computing systems

Tie strength changes

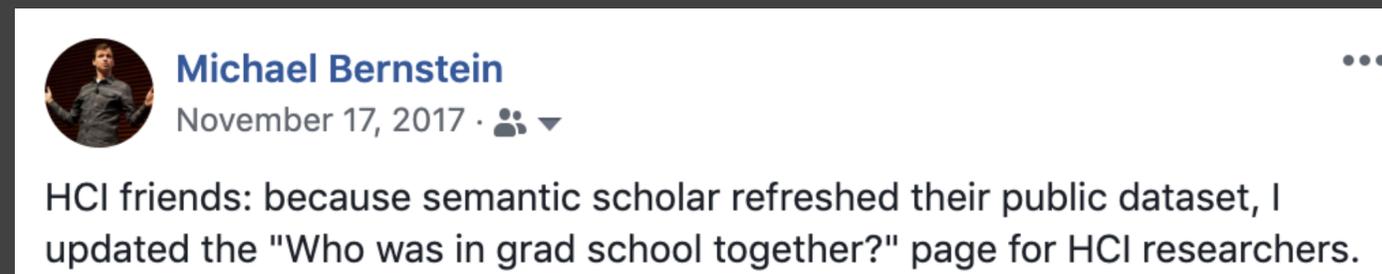
[Burke and Kraut 2014]

Tie strength isn't static over time, and social media use changes it.

Tie strength does go up on Facebook by reading and reacting to broadcast content:



Looking at photos



Reading status updates



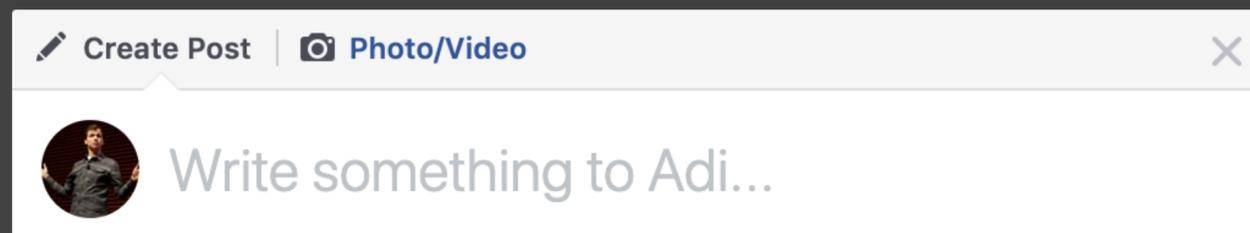
Performing one-click actions

Tie strength changes

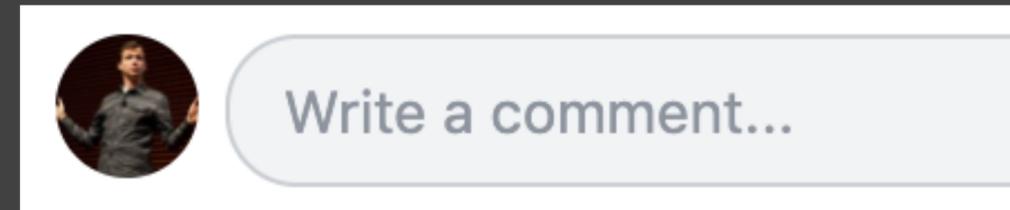
[Burke and Kraut 2014]

Tie strength isn't static over time, and social media use changes it.

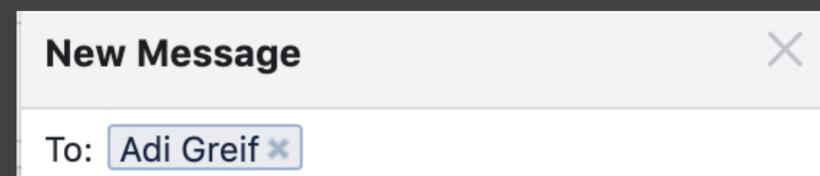
However, tie strength goes up much more with one-to-one communication:



Authoring posts to them



Commenting on their posts



Messaging them one-on-one

Tie strength can be predicted

[Gilbert and Karahalios 2009]

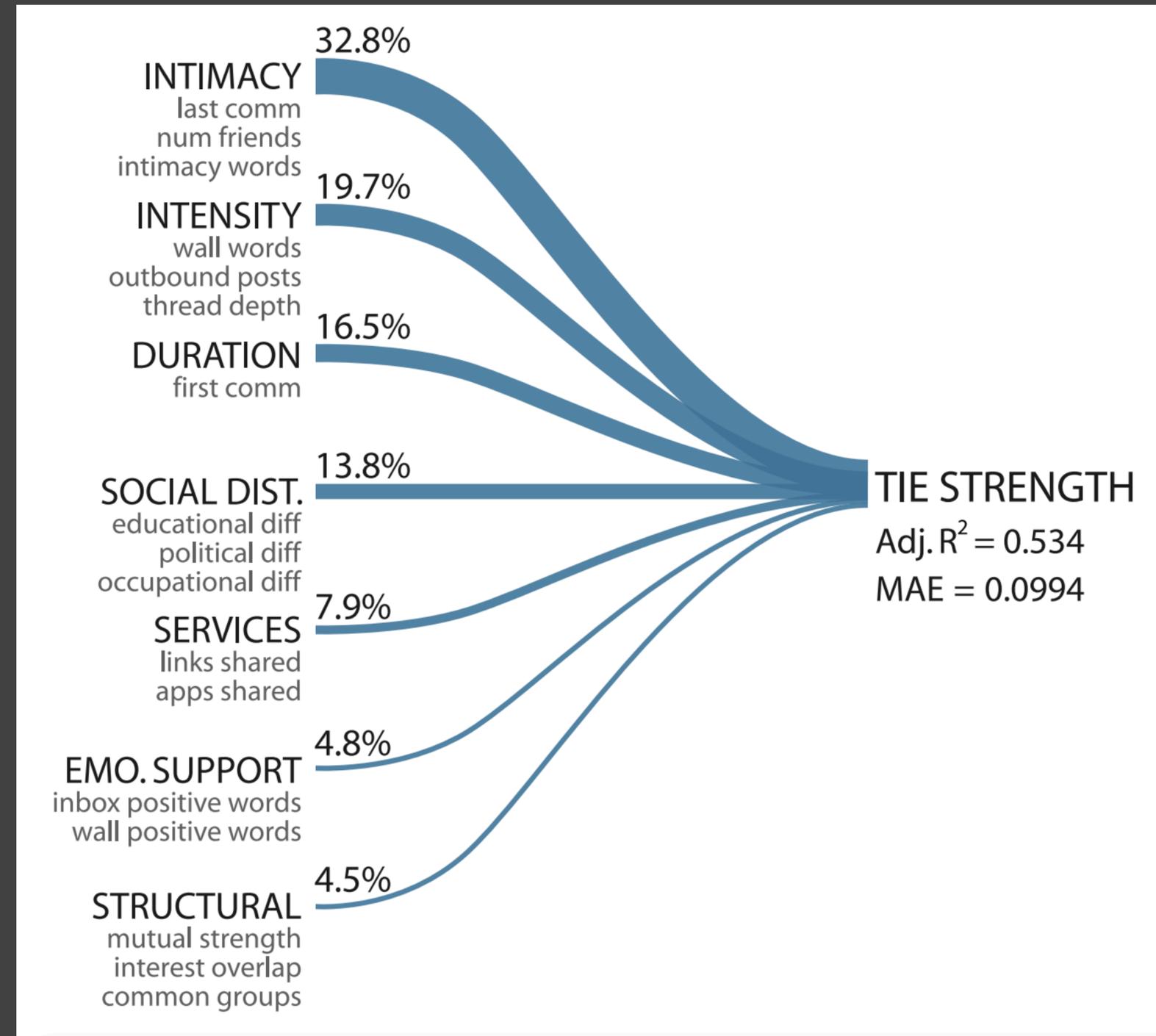
It is feasible to use observable behaviors in social networks to classify the tie strength between two people in the network.

Highly predictive features:

How recently have you messaged?

How long ago did you first message?

Do you talk a lot to each other?



Resulting designs

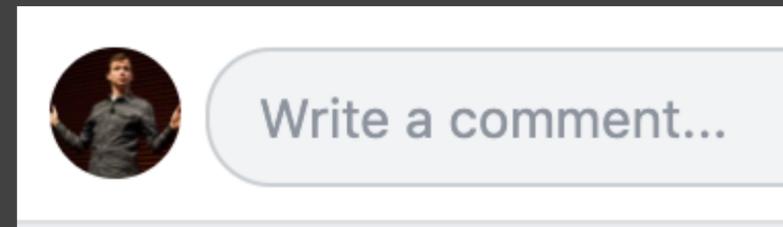
News feed ranking: not just a feature of the content, but also of your predicted tie strength with the other person

People you may know: friend suggestions

Dynamically choosing whether to show comment boxes or quick feedback buttons based on the content and your tie strength with the person



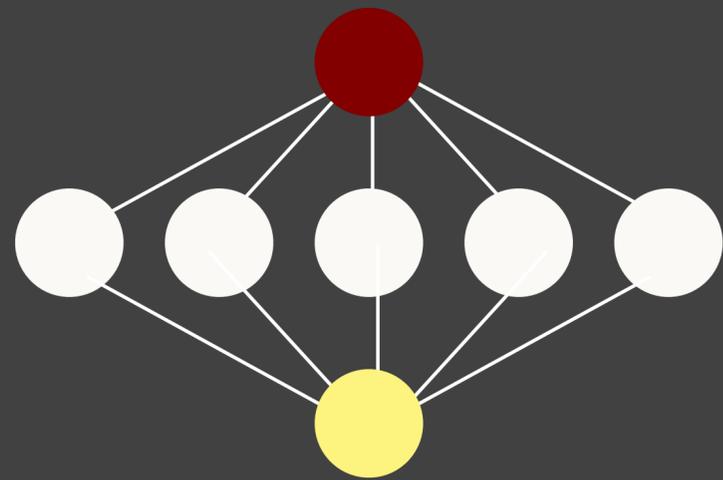
vs.



A note of caution

[boyd 2008]

On Friendster, the system would look for people who share a number of strong ties, but are not connected to each other:



Friendster: ● and ● should totally date!
Let's recommend that they connect!

Reality: ● and ● are actually exes.

Back to the original question:

**Do social computing
systems make us lonely?**

It depends on how you use it.

[Burke and Kraut 2016]

An opt-in study of ~2000 Facebook users, connected to their internal log data, revealed:

Viewing strong or weak ties' status broadcasts, receiving 1-on-1 messages from weak ties, or receiving one-click feedback from strong or weak ties...



No improvements in psychological well-being.

Receiving one-on-one communications from strong ties...



Improvements in psychological well-being.

Summary

We should not design social computing systems to treat our relationships as all the same.

Strong ties: a small number of people we know well — design for honest signals, and don't assume all communication happens through the system.

Weak ties: a large number of acquaintances — design to support feelings of connectedness, but remember that many social systems will be dominated in volume by weak ties.

Tie strength can be modeled, but it doesn't tell the whole story.

Assignment 1

peer grading calibration

Every social system is designed...including our evaluations.

TrueSkill comparisons

[Herbrich, Minka, and Graepel 2007]

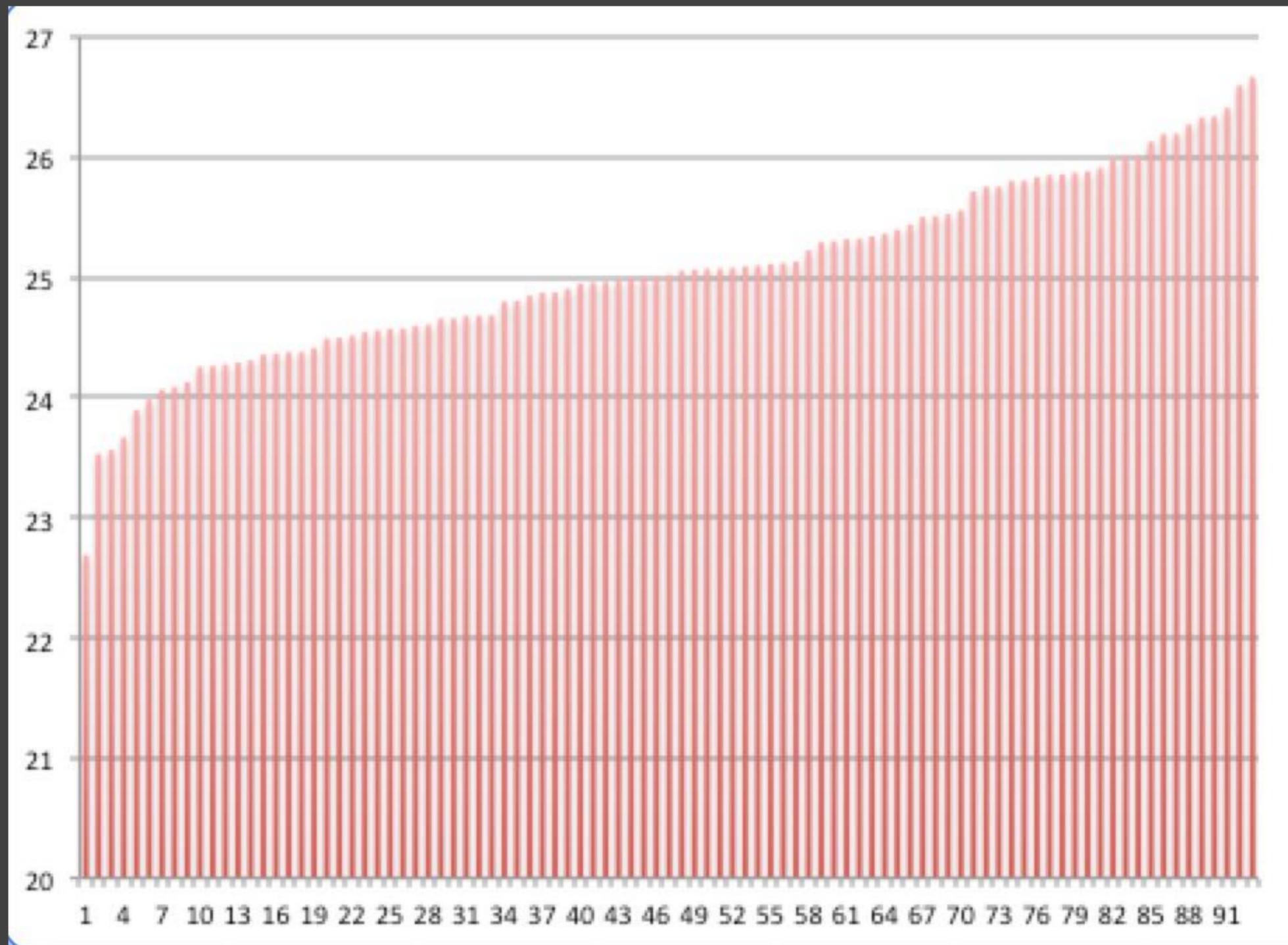
TrueSkill is a skill rating system that was used at Xbox Live to identify skill levels for players.

It's a Bayesian generalization of the Elo chess ranking system. In it, we play “games” between pairs of options, and record which one won.

Intuitively, if you win repeatedly against another player, you should have a higher skill score.

We bootstrap sampled your comparisons to give each student's opinion equal weight.

TrueSkill score



Rank

We sampled two memes each from:

Bottom

25th percentile

50th percentile

75th percentile

Top

Please indicate the score out of 20pt that you would give each.

e.g., $16/20 = 80\%$

Find the rating interface listed as a Quiz on Canvas.

Social Computing

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