

# Bridging in Attention-Allocation Systems

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## Background

- Divisiveness is increasing.
- Division impacts cooperation and conflict.
- The systems that allocate our attention can impact division.
- Systems that directly reward attention can lead to increased division.

## Aims

- A framework and set of open problems that help adapt our existing systems for allocating attention to incentivise “bridging”.
- **Bridging** refers to activities and relationships that lead to increased mutual understanding and trust across divides, and that create space for deliberation and cooperation
- Goal is **conflict transformation**—not to eliminate conflict, create homogeneity or interfere with the substance of civic debates, but to “[make] conflict better in some way.”

Jonathan Stray, *Designing Recommender Systems to Depolarize* (2021)

We use three recurring examples.

## ↓☰ Recommender Systems



\* *Not ads.*

We use three recurring examples.

⇓ Recommender Systems



*\* Not ads.*

🏛 Civic Forums



# We use three recurring examples.

Welcome to a new kind of conversation - vote on other people's statements.

Anonymous wrote: 50 remaining

I trust public health authorities to tell us whether a Covid-19 vaccine is safe

Agree  Disagree  Pass / Unsure

Are your perspectives or experiences missing from the conversation? If so, **add them** in the box below.

What makes a good statement?

- Stand alone idea
- Raise new perspectives, experiences or issues
- Clear & concise (limited to 140 characters)

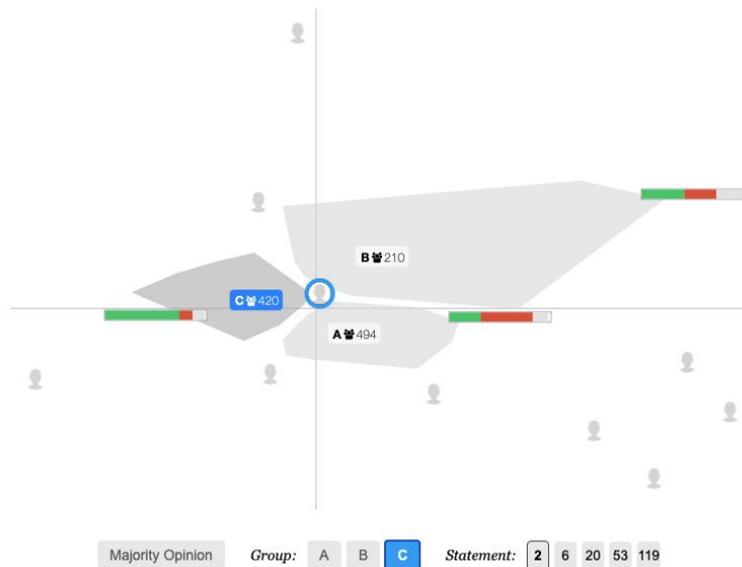
Please remember, statements are displayed randomly and you are not replying directly to other participants' statements.

Civic Foru

Polis

Your Vie

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#2 The authorities shouldn't control what politicians are allowed to say.

74% of those in group C who voted on statement 2 agreed.

We use three recurring examples.

⇓ Recommender Systems



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🗣 Human Facilitation



Participants in the Allegheny Forum Deliberative Poll on September 25, 2010 in Pittsburgh, PA. Image from the [Program for Deliberative Democracy](#), University of Buffalo.

We use three recurring examples.

	 <b>Recommender System</b>	 <b>Civic Forum</b>	 <b>Human Facilitation</b>
people	users	participants	participants
items	posts / content	comments	claims / positions
relations	revealed preferences	agree, disagree, or pass	qualitative opinions

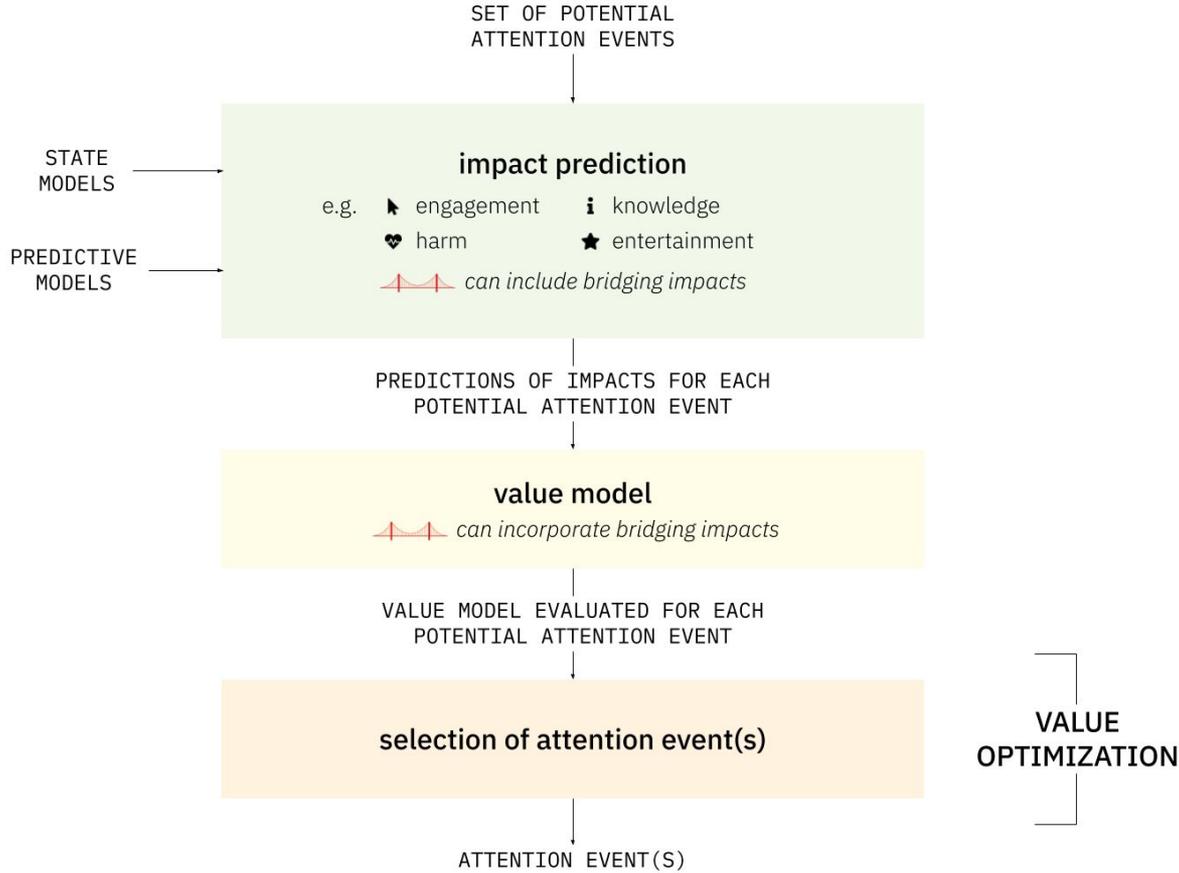
## Information distribution Attention-allocation

- Perhaps more common to talk about such systems (particularly recommenders) as “information distribution”.
- We think attention-allocation is a better frame.
  - Focuses on whether content is actually seen, and the way in which it is attended to.
- (Assumes an instrumental, finite view of attention.)

What is an **attention event**?

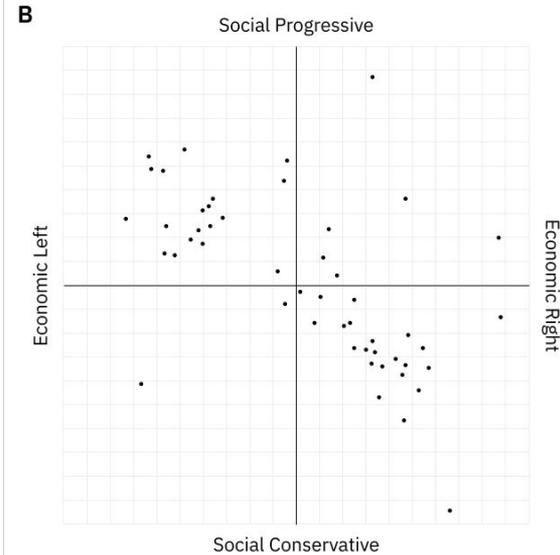
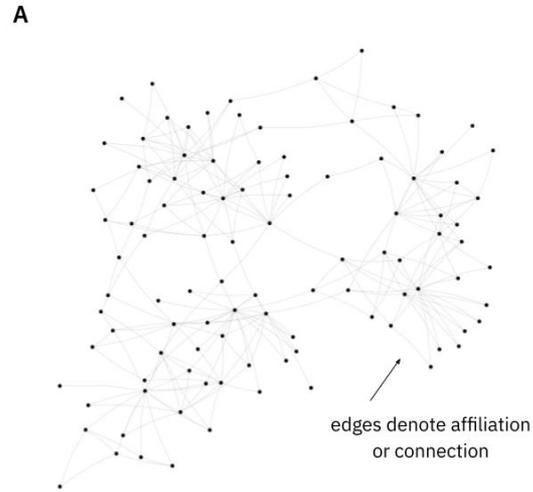
(person, item, properties)

# What is an attention-allocation system?



# What does it mean to be **bridging**?

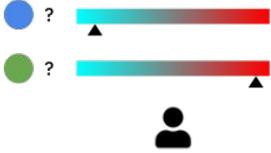
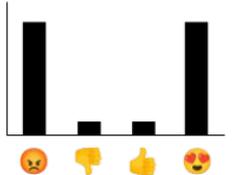
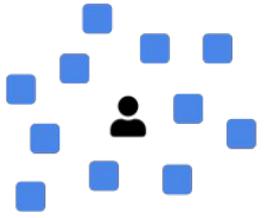
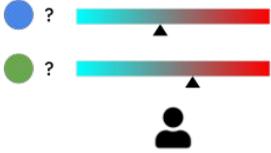
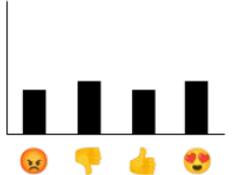
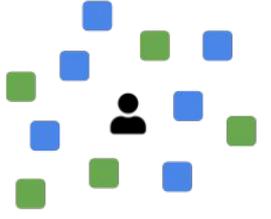
A **relation model** describes the **state** of relations (in a population, at a given point in time).



A **relation metric** characterizes the degree to which relations are **good** or **bad**.

A **bridging metric** characterizes whether an attention event or attention-allocation system causes relations to **improve** or **deteriorate**.

Can also use **bridging** heuristics.

	diverse approval	feeling thermometer	response bimodality	exposure diversity 
“dividing”				
“bridging”				

# Simple example of bridging-based ranking.

reactions from  
● Alice, ● Bob

- A (blue box) with thumbs up emoji
- B (green box) with thumbs up emoji
- C (green box) with heart eyes emoji
- D (blue box)

reactions from  
● Oscar, ● Wendy

- A (blue box) with thumbs up emoji
- B (green box)
- C (green box) with angry face emoji
- D (blue box) with thumbs up emoji



**ENGAGEMENT**  
based ranking  
for ● Igor

- C (green box)
- B (green box)
- A (blue box)
- D (blue box)

**BRIDGING**  
based ranking  
for ● Igor

- A (blue box)
- B (green box)
- D (blue box)
- C (green box)

# More sophisticated example of bridging-based ranking.

- E** ● supporters frequently reshare, ● supporters usually don't interact
- F** ● Alice and ● Wendy both comment, liking 👍 each other's comments
- G** ● Bob shares ● Oscar's post with a comment, ● supporters react with 🤔
- H** a longer post by ● Alice is shared widely by ● supporters who often read to the end, and comment, to which ● Alice replies individually



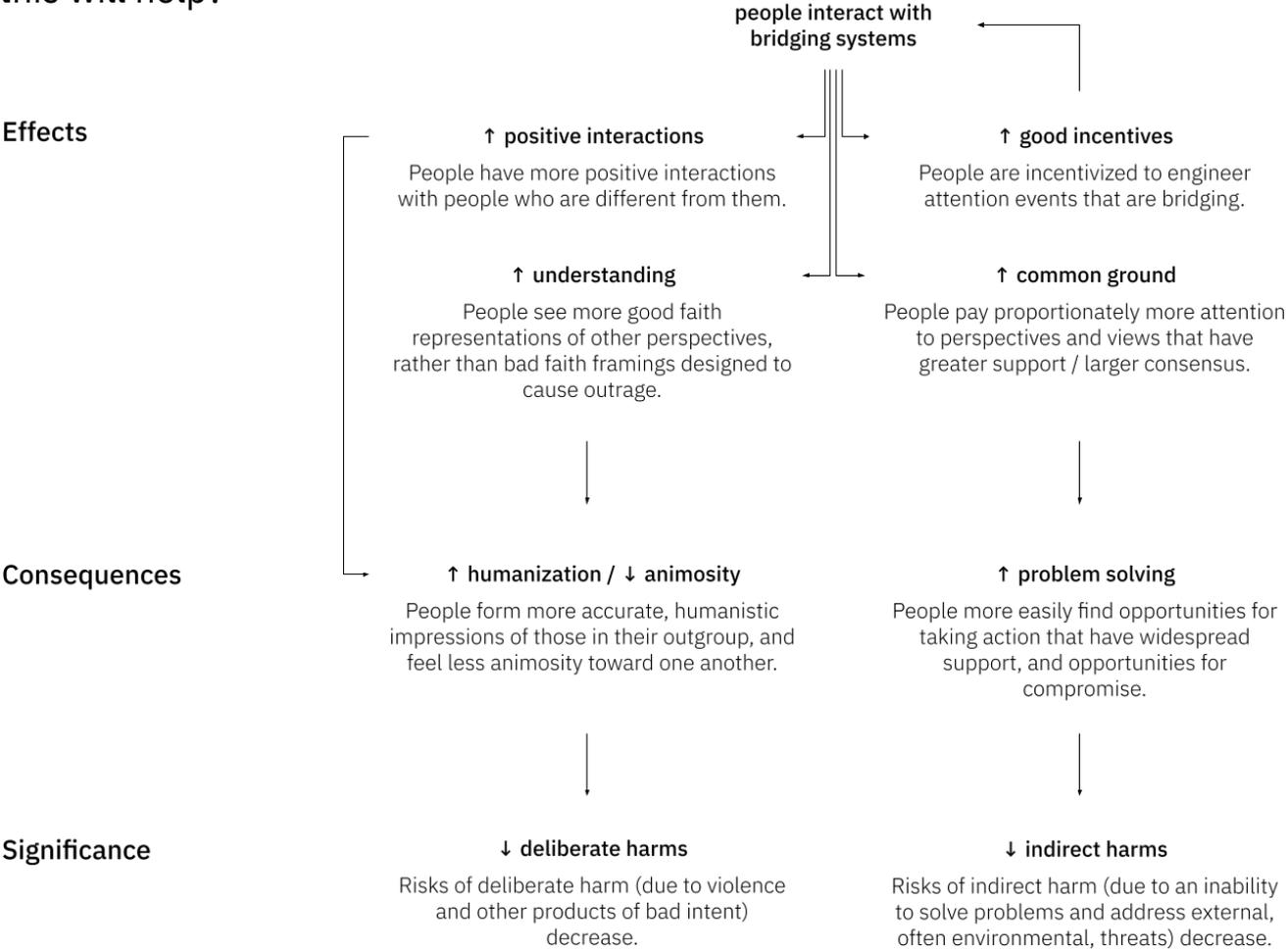
ENGAGEMENT based ranking for ● Igor

- G**
- H**
- F**
- E**

BRIDGING based ranking for ● Igor

- F**
- H**
- E**
- G**

# Why do we think this will help?



# Conclusion

Many open questions:

How common are bridging attention events in practice?

How good are these bridging heuristics?

What relation and bridging metrics should we use?

What perverse incentives might optimizing for bridging create?

How do we validate or evaluate the usefulness of relation metrics and bridging metrics?

How can the framework of an attention-allocation system be improved?

How should we think about the ethics of optimizing for bridging?

This is joint work with [Aviv Ovadya](#).  
Harvard→Cambridge



Builds on huge amount of prior work by others.

Link to paper: [go.aviv.me/bridging-systems-paper](https://go.aviv.me/bridging-systems-paper)

Please don't distribute just yet!