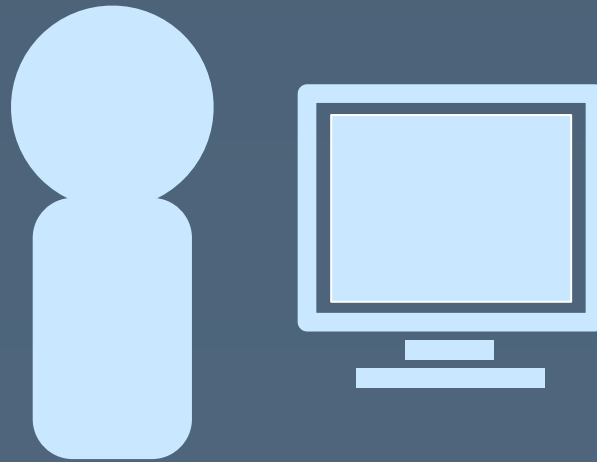


Social Computing

MICHAEL BERNSTEIN

SPRING 2013

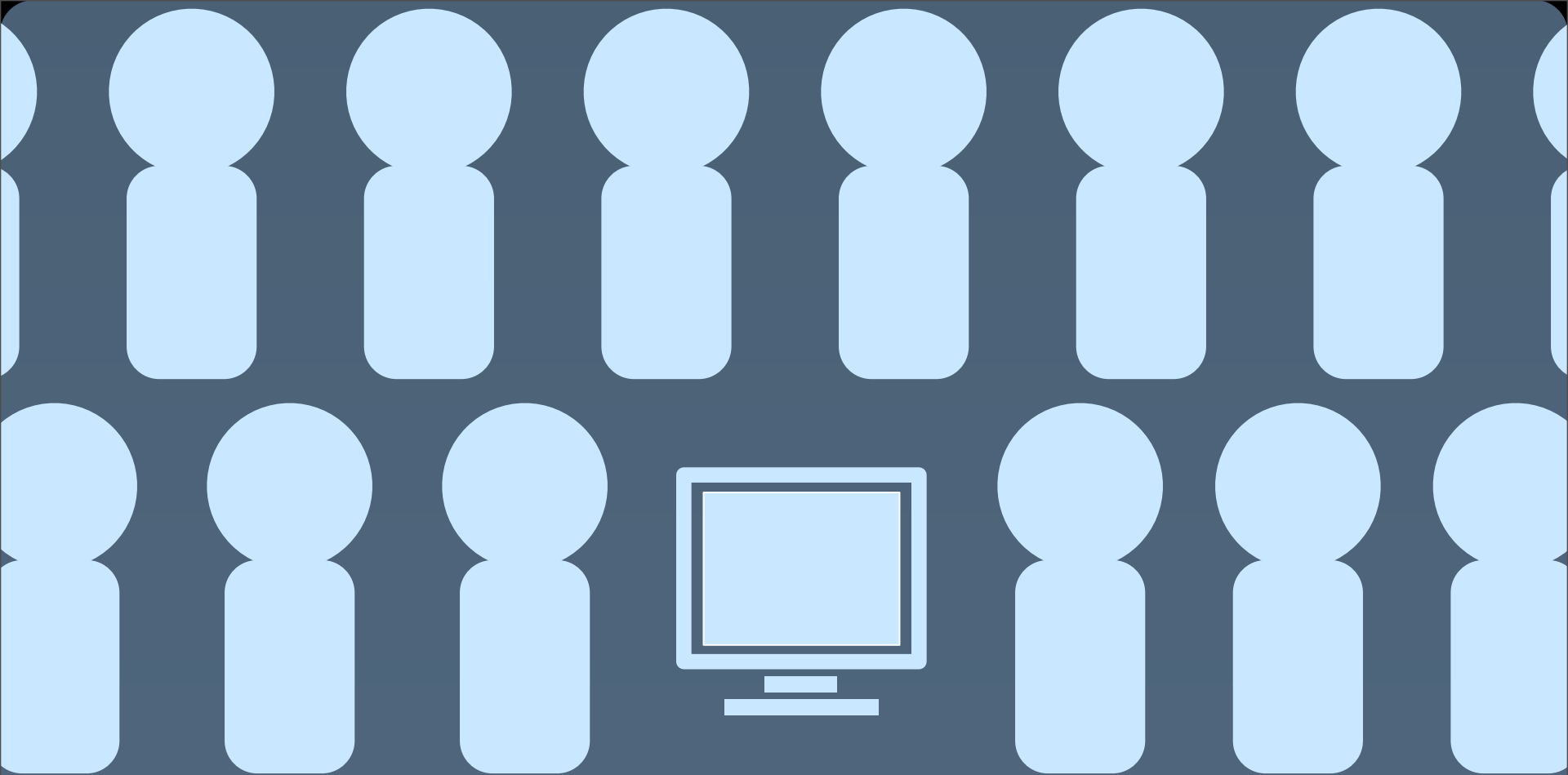
cs376.stanford.edu



Human-computer interaction



Ubiquitous computing



Social computing

Social computing goals

- Design new forms of large-scale human interaction
- Take advantage of the technology-mediated nature of the medium to understand human relationships
- Guide large groups of people to achieve complex, large-scale goals

The intellectual challenge of social computing design

- User-centered design perspective:
 - “The social-technical gap is the divide between what we know we **must** support socially and what we **can** support technically.”
[Ackerman 2000]

The intellectual challenge of social computing design

- User-centered design perspective:
 - “The social-technical gap is the divide between what we know we **must** support socially and what we **can** support technically.”
[Ackerman 2000]
- Invention and design thinking perspective:
 - By lowering the transaction costs to connect with others, what kinds of unstated needs and new behaviors might the internet empower?
[Shirky 2008]

The intellectual challenge of social computing science

- How has technology-mediated interaction changed our relationship with each other and with the world?
- By manipulating the technology platform, can we learn how people interact with each other?

Sociotechnical system

Emergent behaviors result from interactions between social relationships and technological interventions.

Social computing

vs.

Crowdsourcing

Social computing

People seek out each other

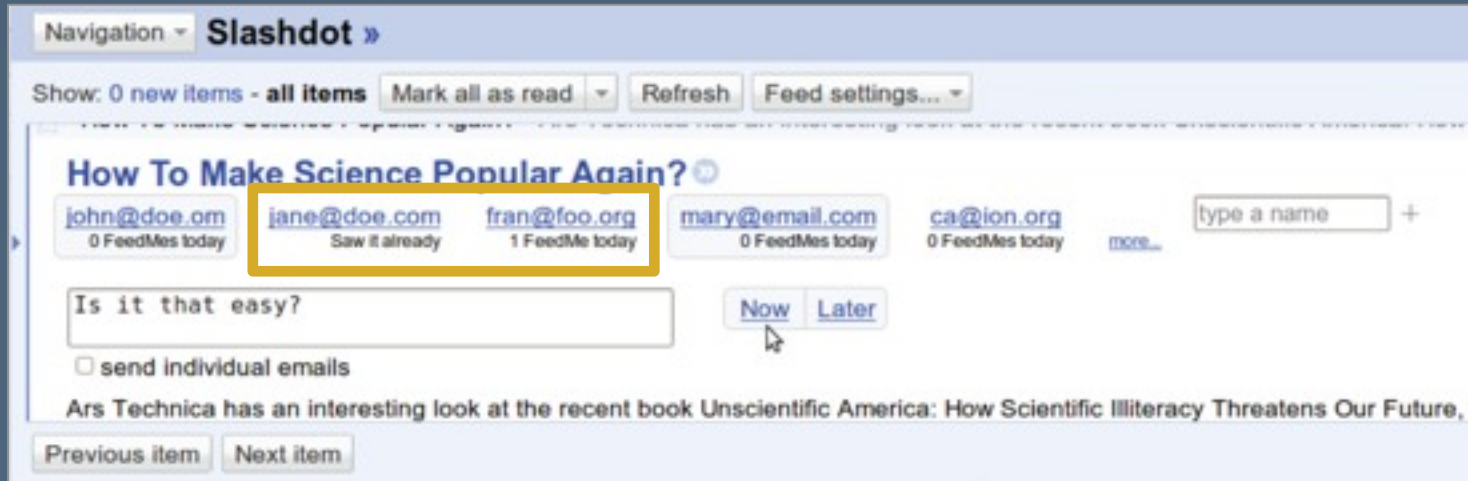
Crowdsourcing

The system seeks out people

Design

Directed communication

- Feedback and social signaling



[Bernstein et al., CHI 2010]

- ReMail, tracking threaded conversations
[Rohall et al. 2004]



Broadcast communication

- Who has seen this before? [Gilbert, CHI '12]



- Narrowcasting to a selective audience [Viégas and Donath, CHI '99]



Managing information overload

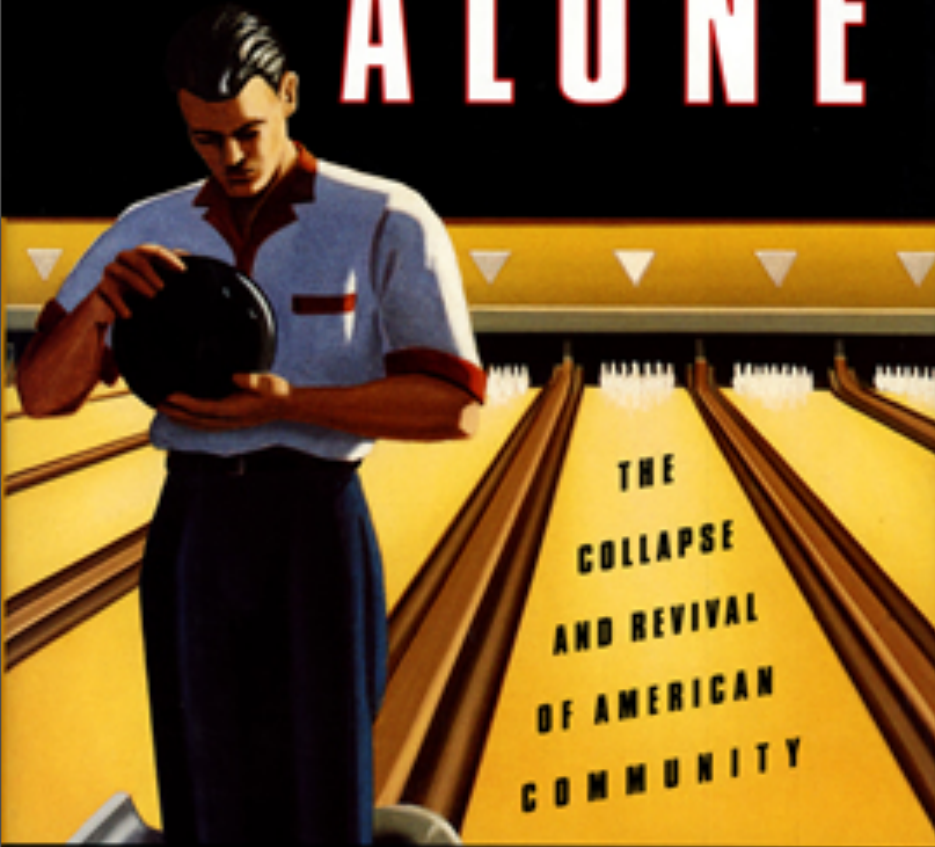
- Learning from one user's behavior to predict another user's behavior
 - GroupLens, aimed at personalizing and filtering usenet [Resnick et al., CSCW '94]
- Sorting, filtering, exploring social streams



[Bernstein et al., UIST '10]

Understanding

BOWLING ALONE



Robert D. Putnam

Social capital
- bridging
- bonding

Social capital in social network sites (SNSes)

- Facebook usage increases all types of social capital, especially bridging social capital [Ellison, Steinfeld and Lampe, JCMC '07]

Regression predicting bridging capital scale

	Scaled Beta	p
Intercept	3.80	****
Gender: male	-0.02	
Gender: female	0.02	
Ethnicity: white	0.08	*
Ethnicity: nonwhite	-0.08	*
Income	0.04	
Year in school	0.00	
State residence: in-state	-0.05	
State residence: out-of-state	0.05	
Local residence: on campus	-0.04	
Local residence: off campus	0.04	
Fraternity/sorority member	-0.01	
Not member of fraternity/sorority	0.01	
Hours of Internet use per day	-0.03	
Self-esteem	0.20	***
Satisfaction with life at MSU	0.66	****
Facebook (FB) intensity	0.34	****
Self-esteem by FB intensity ⁴	-0.35	**
Satisfaction by FB intensity		

Conflict and coordination on Wikipedia

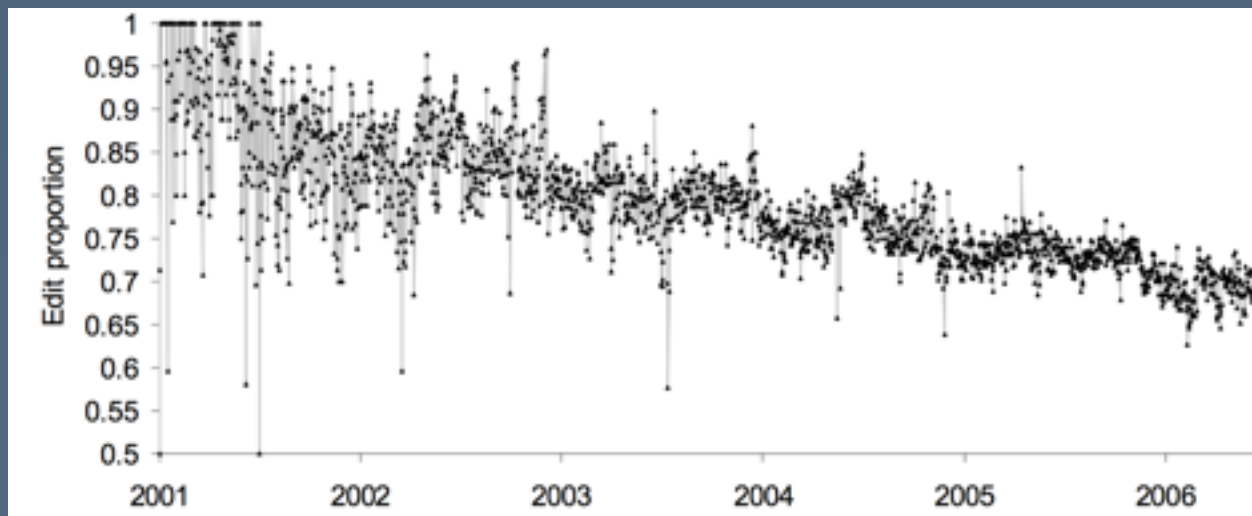
- What happens to collaboration costs as Wikipedia grows?
[Kittur, Suh, Pendleton, and Chi, CHI '07]

Conflict and coordination on Wikipedia

- What happens to collaboration costs as Wikipedia grows?

[Kittur, Suh, Pendleton, and Chi, CHI '07]

Amount of direct work on articles goes down,
and activity on coordination pages goes up



Conflict and coordination on Wikipedia

- As more editors join, which kinds of coordination techniques succeed?
[Kittur and Kraut, CSCW '08]
 - Explicit: participation in talk pages
 - Implicit: set direction by making edits

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More editors only improves article quality only with implicit coordination – a few take on a disproportionate amount of work.

Predicting Tie Strength

- The Strength of Weak Ties
[Granovetter, Am. Jour. of Soc. '73]
 - Strong ties: a small number of people you know very well
 - Weak ties: your large number of acquaintances
 - Theory: your weak ties are bridges to other parts of the network; they can help you find jobs and information
- Coming up: how well can you predict tie strength observationally using social media?

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Crowdsourcing

Participation toward a goal

- Data collection, machine learning training, user studies, social science experiments
[Ipeirotis 2010, Heer et al. 2010, Kittur et al. 2008]
- Games with a purpose
[von Ahn and Dabbish 2004, Cooper et al. 2011]
- Collective action
[Wikipedia, Polymath Project, Search for Jim Gray]

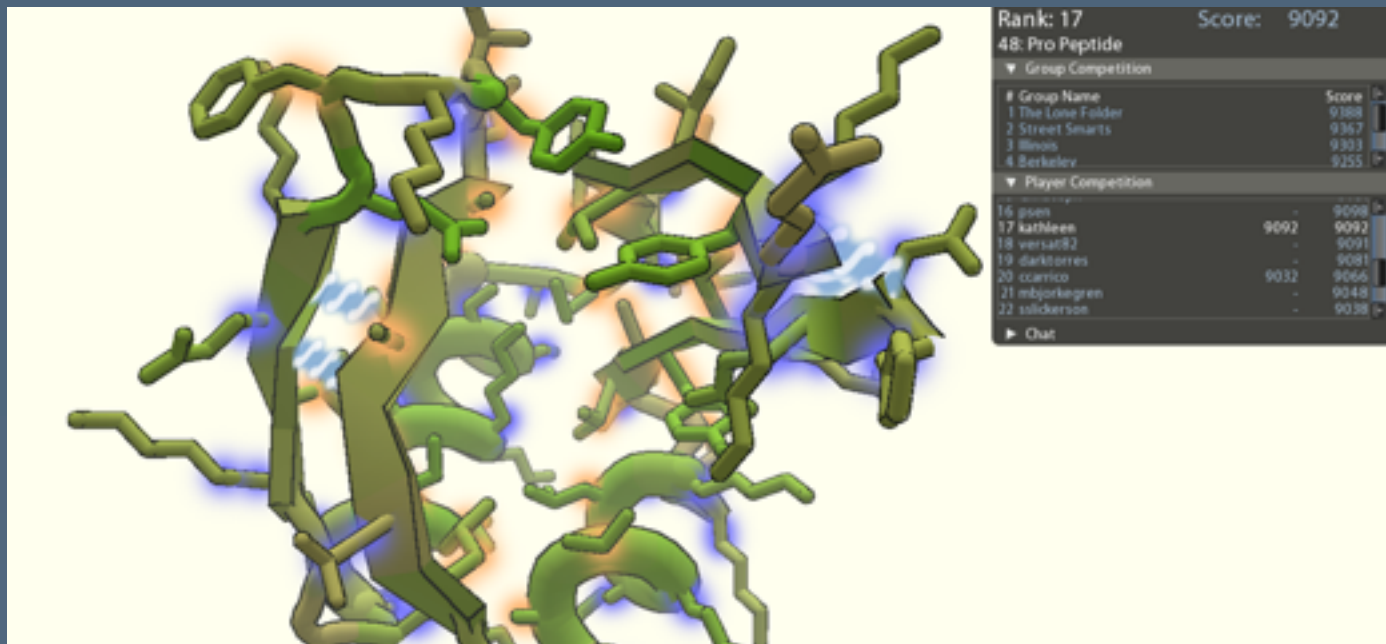
Games with a Purpose

Label every image on the internet using a game [von Ahn and Dabbish, CHI '06]



Scientific Collaboration

- FoldIt: protein-folding game
 - Amateur scientists have found protein configurations that eluded scientists for years



Paid Crowdsourcing

- Pay small amounts of money for short tasks
- Amazon Mechanical Turk: Roughly five million tasks completed per year at 1-5¢ each
[Ipeirotis 2010]

Label an image

Reward: \$0.02

Transcribe audio clip

Reward: \$0.05

- Population: 40% U.S., 40% India, 20% elsewhere
- Gender, education and income are close mirrors of overall population distributions
[Ross 2010]

Paid Crowdsourcing: Goals

- Design and create crowd-powered systems (e.g., Soylent)
- Design algorithms and design patterns for complex tasks
- Understand worker motivation
- Quality control
- Coming up in a future class...