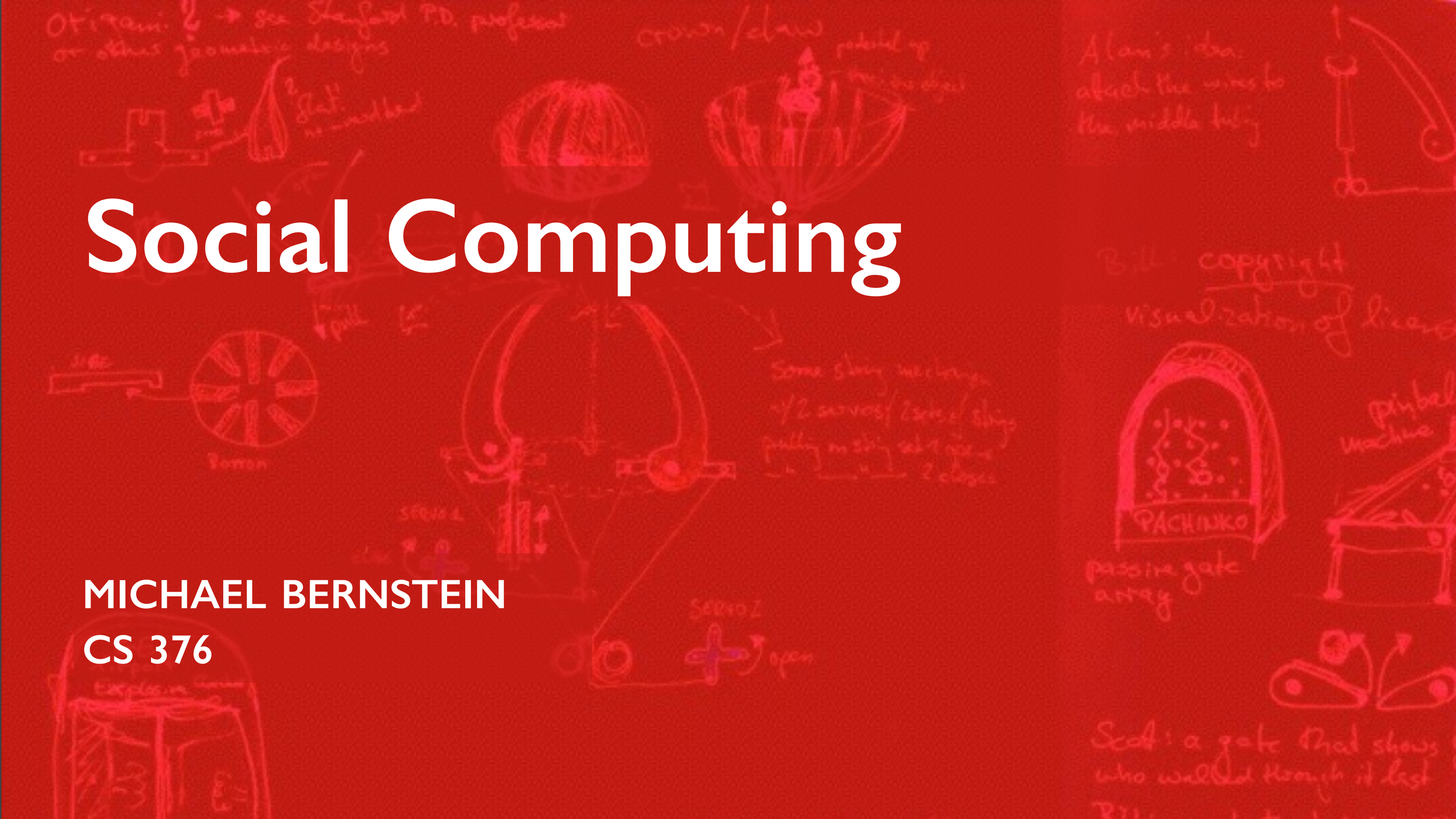
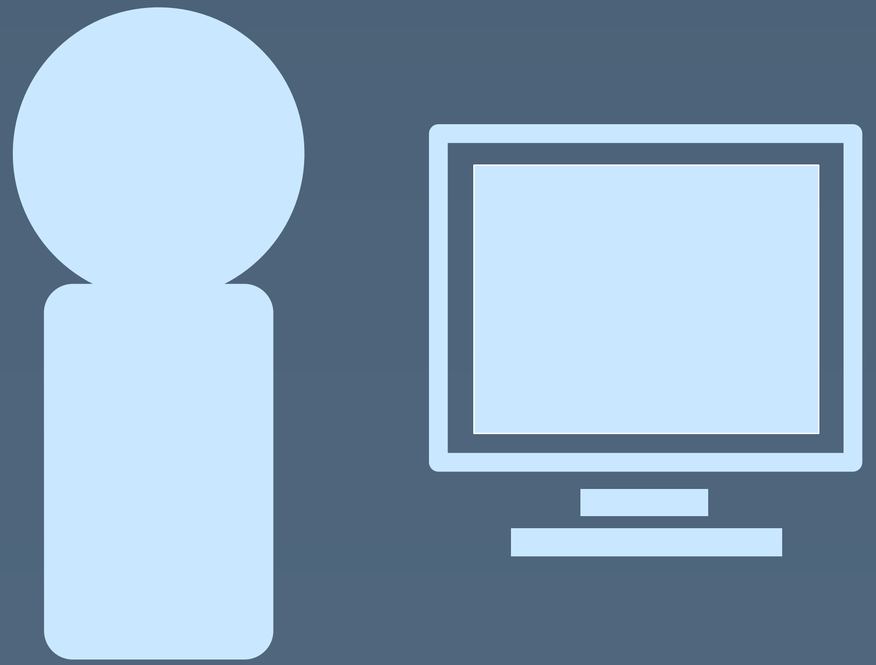
Social Computing



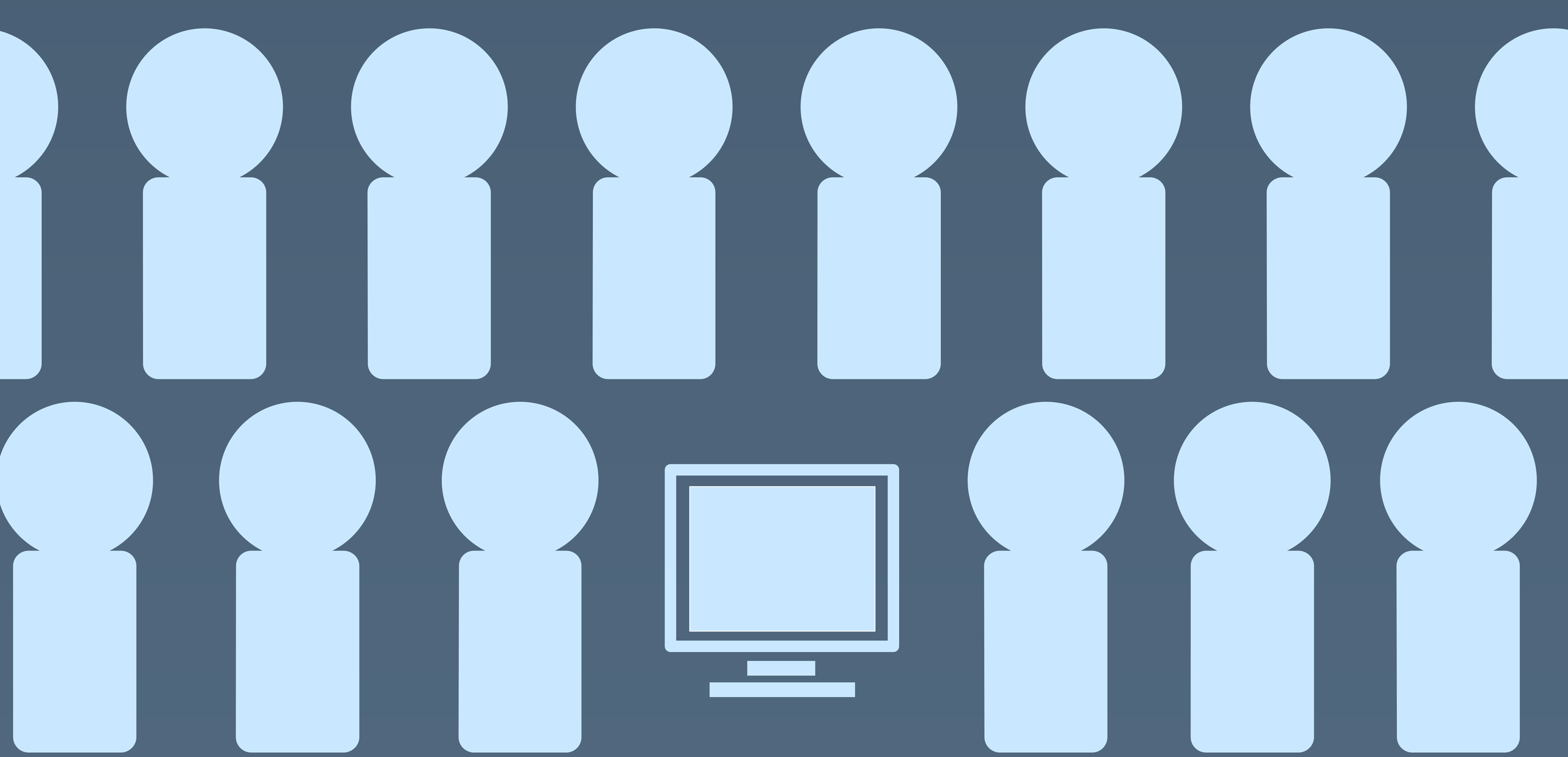
MICHAEL BERNSTEIN

CS 376



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]
- 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.

Terminology

Social computing vs. Crowdsourcing?

Terminology

- **Social computing**
  People seek out each other

- **Crowdsourcing**
  The system seeks out people

Design

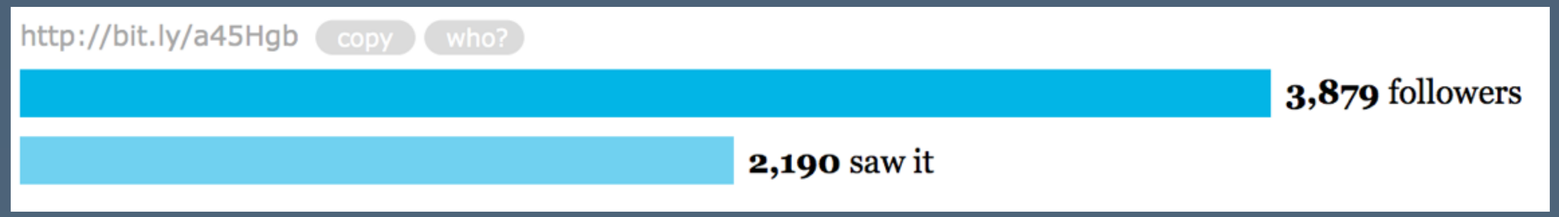
Directed communication

- **Feedback and social signaling** [Bernstein et al., CHI 2010]

- **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

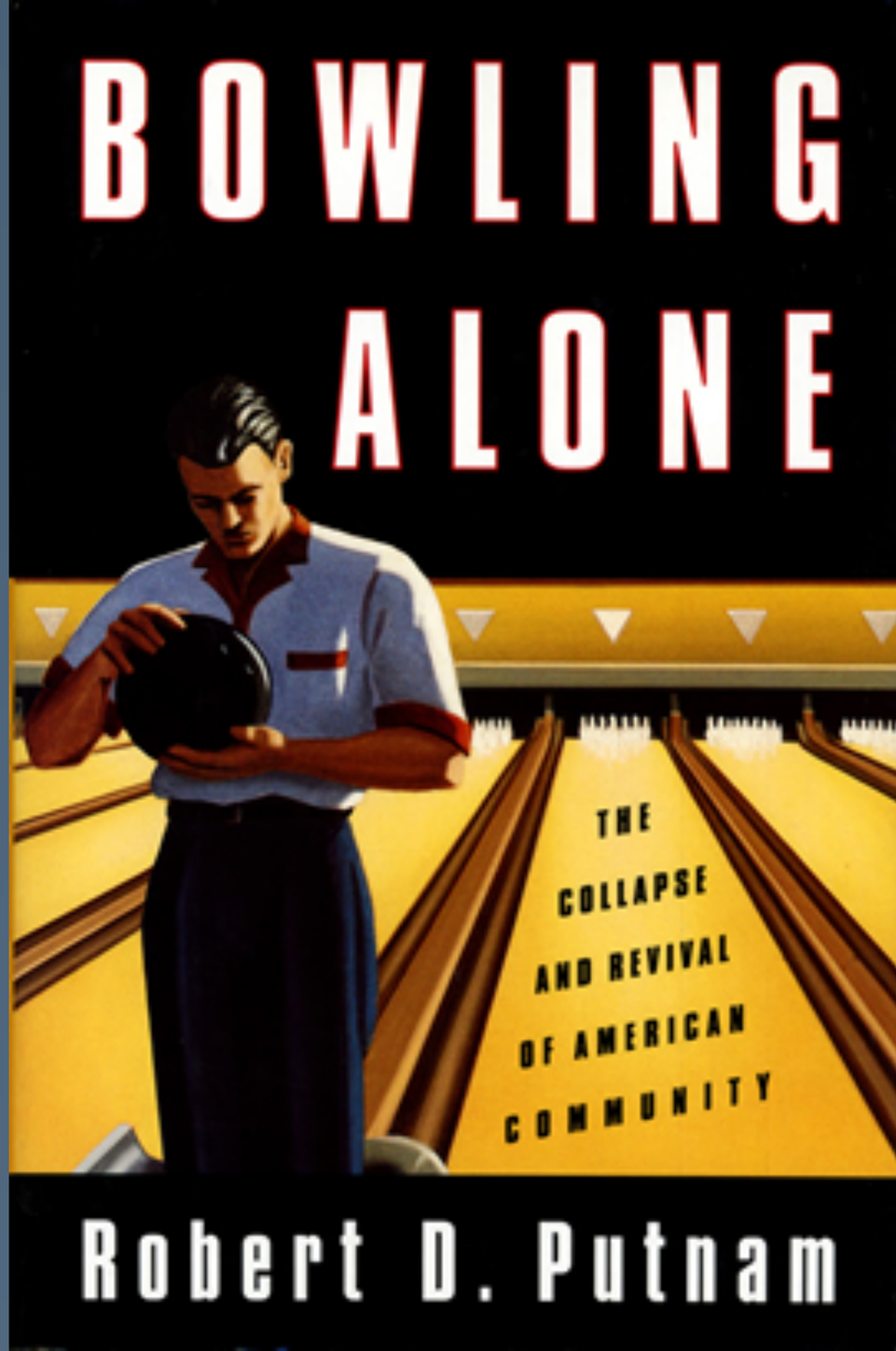
- Learning from one user's behavior to predict another user's behavior
  - GroupLens, aimed at personalizing and filtering usenet [Resnick et al., CSCW '94]
- Sorting, filtering, exploring social streams

[Bernstein et al., UIST '10]

Understanding

Social capital

- Bridging
- Bonding



Social capital in social network sites (SNSes)

- Facebook usage increases all types of social capital, especially bridging social capital

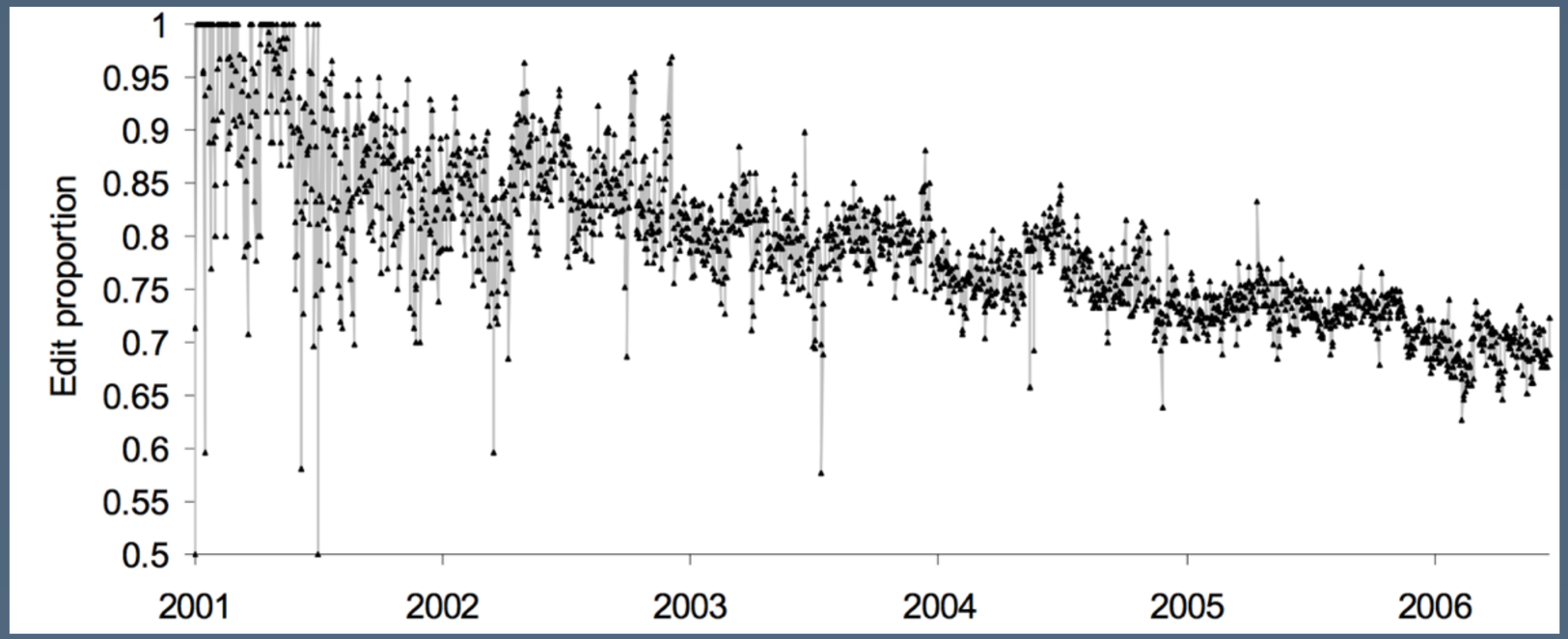
[Ellison, Steinfeld and Lampe, JCMC '07]

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	****

Conflict and coordination

- **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

- **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**

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]

  Cited by 23692

  - 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
- How well can you predict tie strength observationally using social media?
- Coming up: What happens to tie strength when you communicate using social media?

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]

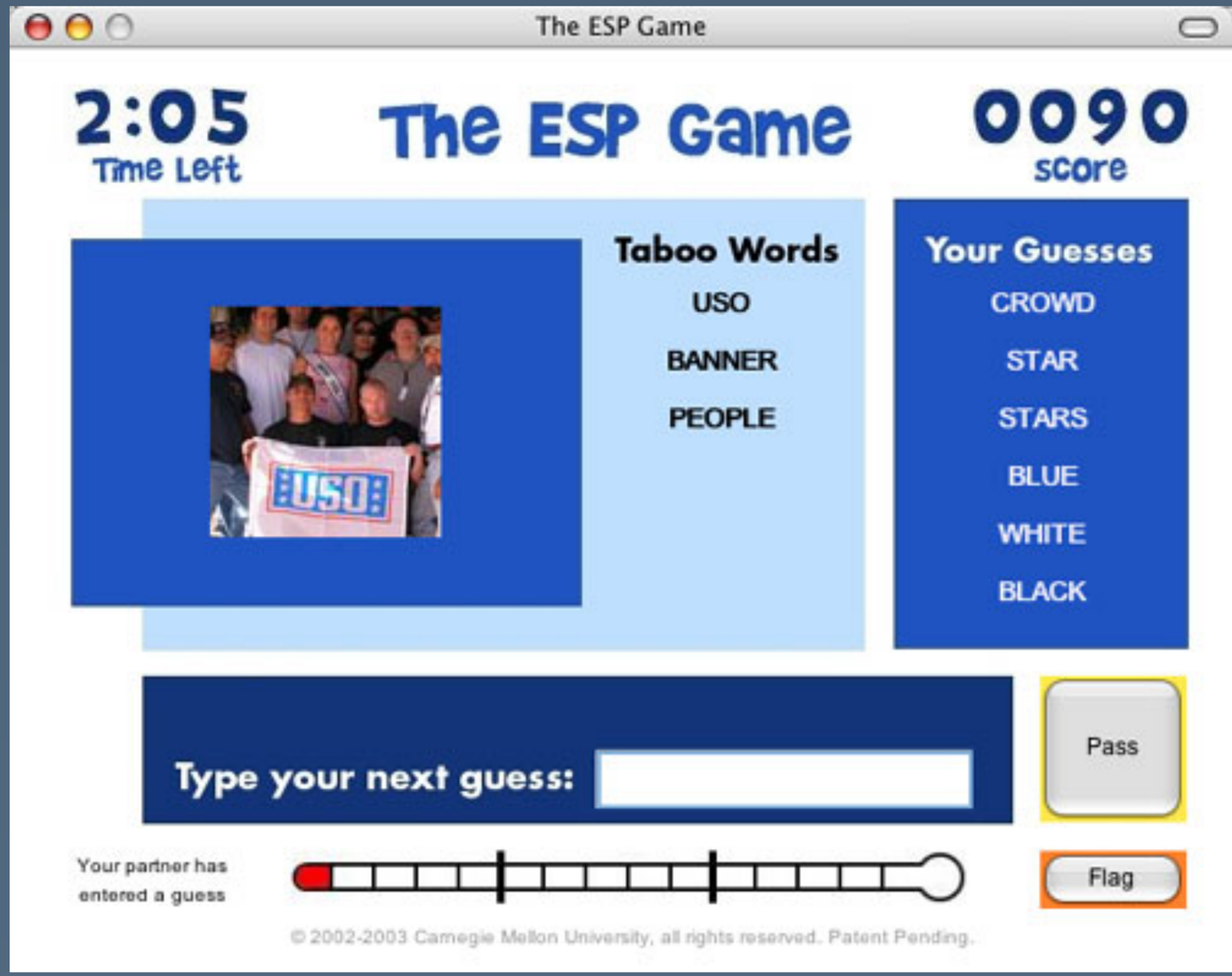
- **Games with a purpose**
  [von Ahn and Dabbish 2004, Cooper et al. 2011]

- **Collective action**
  [Wikipedia, Polymath Project, Search for Jim Gray]

Games with a Purpose

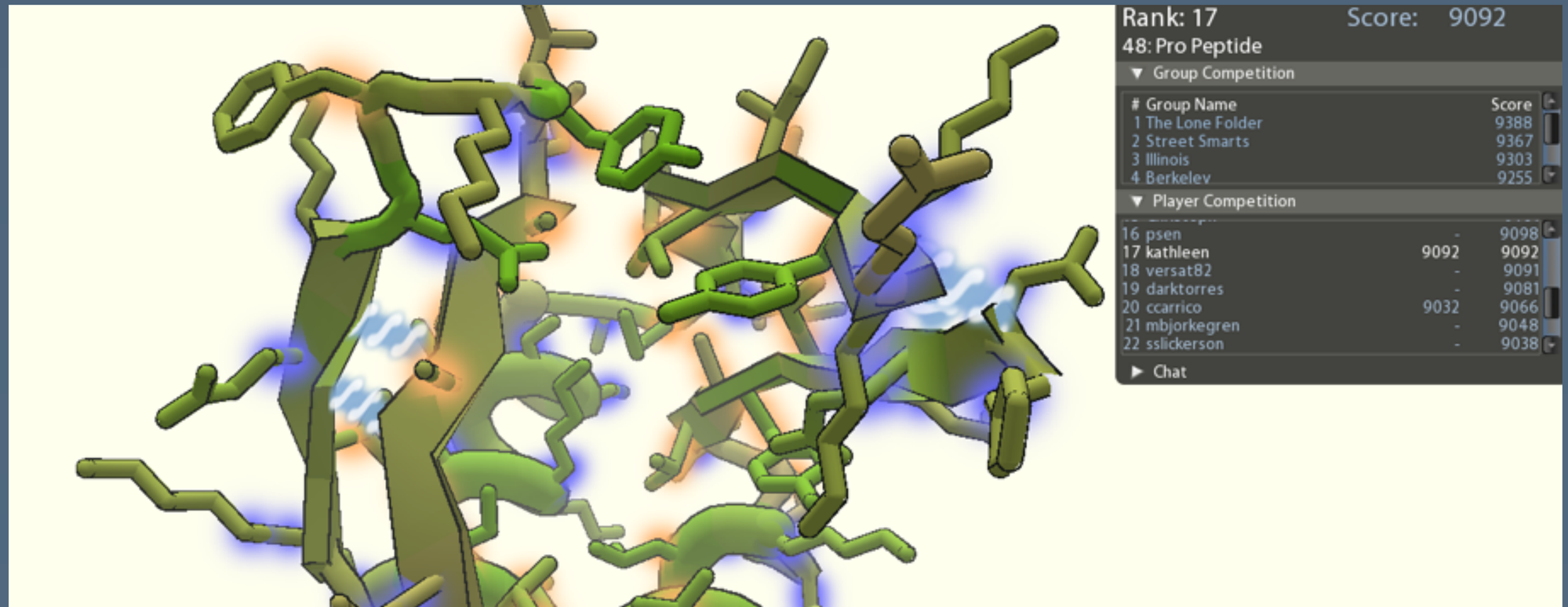
Label every image on the internet using a game

[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...