

CS 193.1: Social Computing

# **Collective Intelligence and Crowdsourcing**



# **How do we derive knowledge or solve problems?**

Give some examples.

# Manners of “intelligence”



**Informed  
hypothesizing**



**Process of  
elimination**



**Domain  
knowledge  
from experts**



# In many cases, individual intelligence isn't enough.



Unfamiliar situations cannot be easily broken down.

# **Activity: Guess it!**

- Individually guess the number of Chocnut found inside this container.



**Individually, we don't  
perform well.**



What if we combined our solutions?

# Collective intelligence

- The closest solution to a problem is the **general average of the proposed solutions.**
- Why?
  - Diversity of opinion
  - Independence of thought
  - Decentralization of strategy
  - Aggregation of insight



# Why is diversity of intelligence important?



**Individual judgement**  
not consistent and can  
succumb to biases.



**Different lenses** of  
viewing problems is  
more valuable than  
one perspective.

# We have two assumptions:



The (private) information an individual has is imperfect.



The (private) information others have are also imperfect.



Thus, society needs  
to be collectively  
intelligent.

How do we go about this?

# Information Cascade



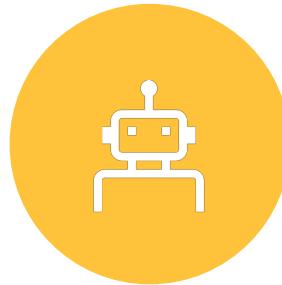
A **decision** based on info provided by others and your own observations.



**Learning by example** of others, but still **deciding independently** nonetheless.



This is not the same as conformity or groupthink.



The way we adopt technology is an information cascade.

# Information cascades are decentralized aggregations of knowledge.

Think of autonomous beings working towards the same goals.

# Designing a collectively intelligent system (CIS)



**Collective  
goals**



**Smart  
individuals**  
Informed by  
cognitive  
processes

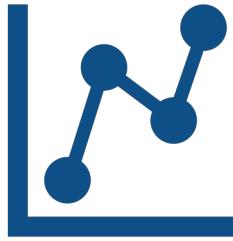


**Motivational  
incentives**  
Guided by  
coordination and  
cooperation

# **Do CIS's exist now?**

Let's name some examples.

# CIS's in the real world...



Repositories like ArXiv or search engines like Google provide ***collected intelligence***.

No truly new levels of understanding from aggregated analytics



CIS's should **boost the collective IQ** of its members.

Not just description or prediction  
Should include prescription!

# CIS's in the real world...

- They exist now, although on varying levels of intelligence.
  - Recommender systems
  - Virtual assistants
  - Genetic programs



# **Are there issues with collective intelligence?**

Why do these arise?

# Collective intelligence isn't perfect.

- People naturally **imitate** others (social norms, memes).
  - **Q:** What social norms have you inherited from your relatives?
- We are **embedded in social contexts** and we can definitely influence how others think.





**Next time...**

Social systems

Social networks

QU2: Collective intelligence