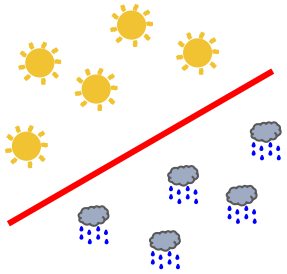
some aspects of

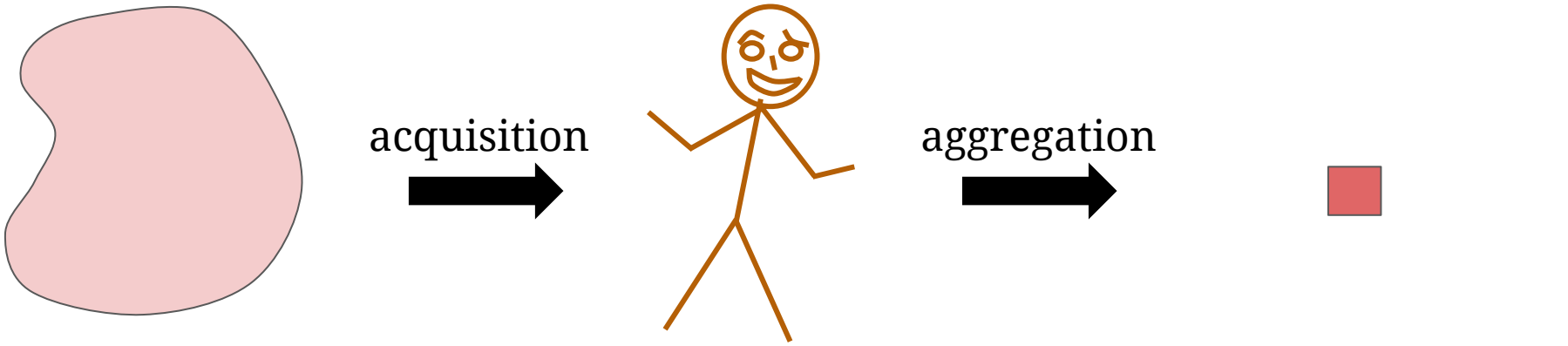
Acquiring and Aggregating Information



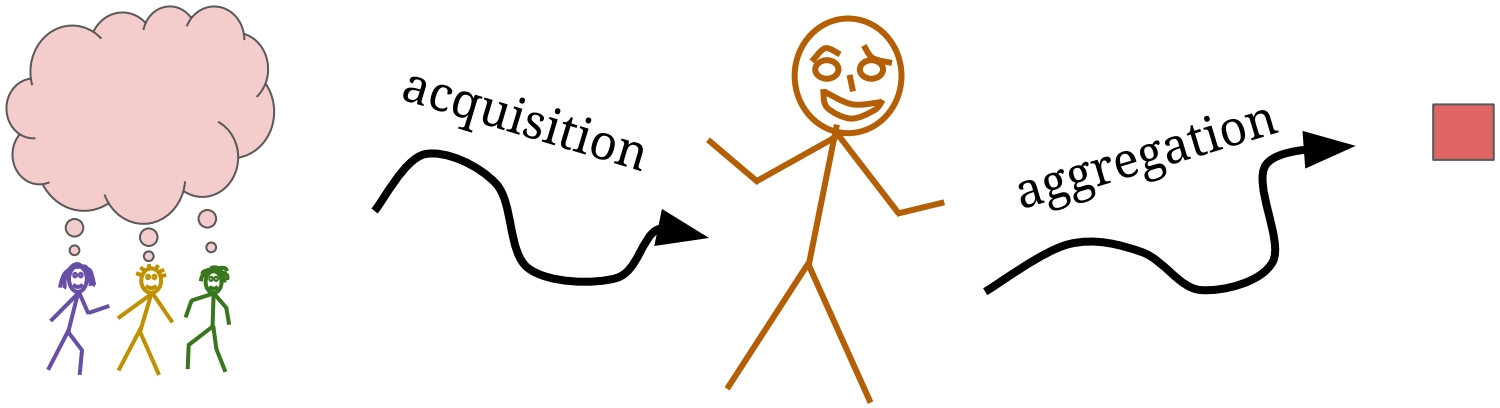
Bo Waggoner, UPenn

CNC - October 2016

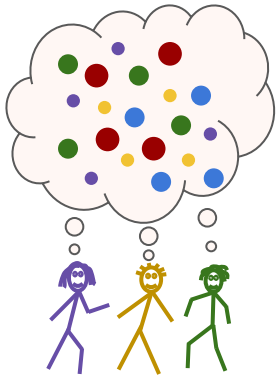
A common pattern…



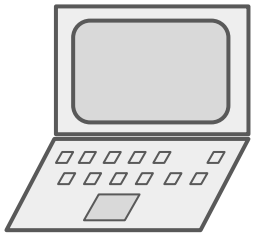
The challenges of *incentives*



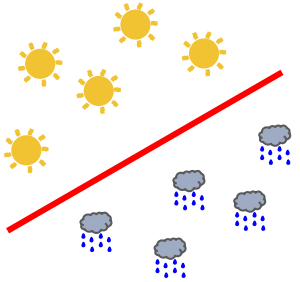
What is information?



acquisition



aggregation

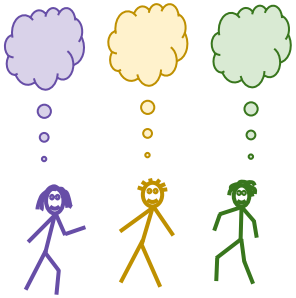


information
= data

algorithm

useful summary
= a hypothesis

What is information? (2)



acquisition

aggregation

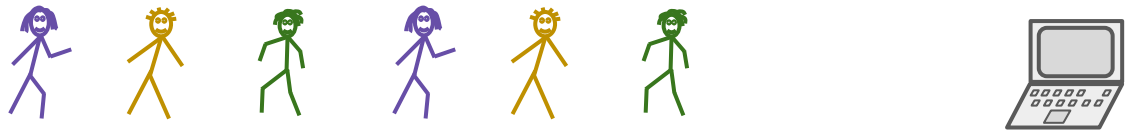
information
= expert beliefs

mechanism

useful summary
= prediction

Example: information = data

- Agents arrive in sequence holding data points
- Goal: purchase **most useful** data **cost-effectively**
- Idea #1: use learning algorithm to measure usefulness
- Idea #2: bias toward cheap data … later de-bias



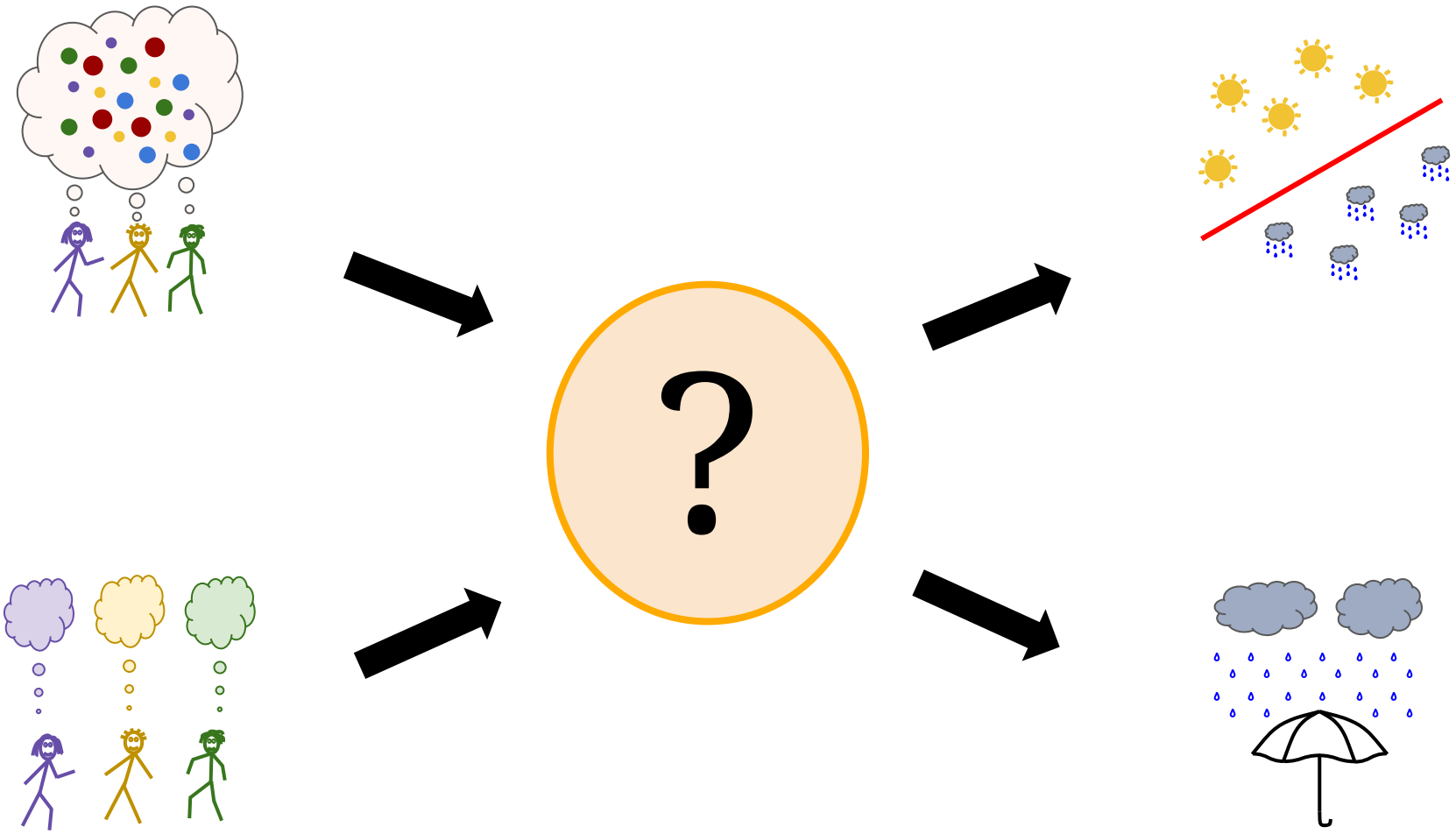
[Abernethy, Chen, Ho, Waggoner 2015]

Example 2: information = beliefs

- Agents arrive in sequence holding “signals”
- Goal: incentivize these Bayesians to **aggregate**
- Approach: Prediction markets! [Hanson 2003, etc.]
- Idea: if signals are “substitutes”, rush to aggregate

[Chen, Waggoner 2016]

Reconciling both perspectives?



[Chen, Nissim, Waggoner 2015]
[Waggoner, Frongillo, Abernethy 2015]

Goals / directions

Value of data and mechanisms to acquire it
[Chen, Liu, Waggoner, Zheng, working paper]

Reconciling information as **data** vs **beliefs**

Usefulness of **substitutes and complements** of information?