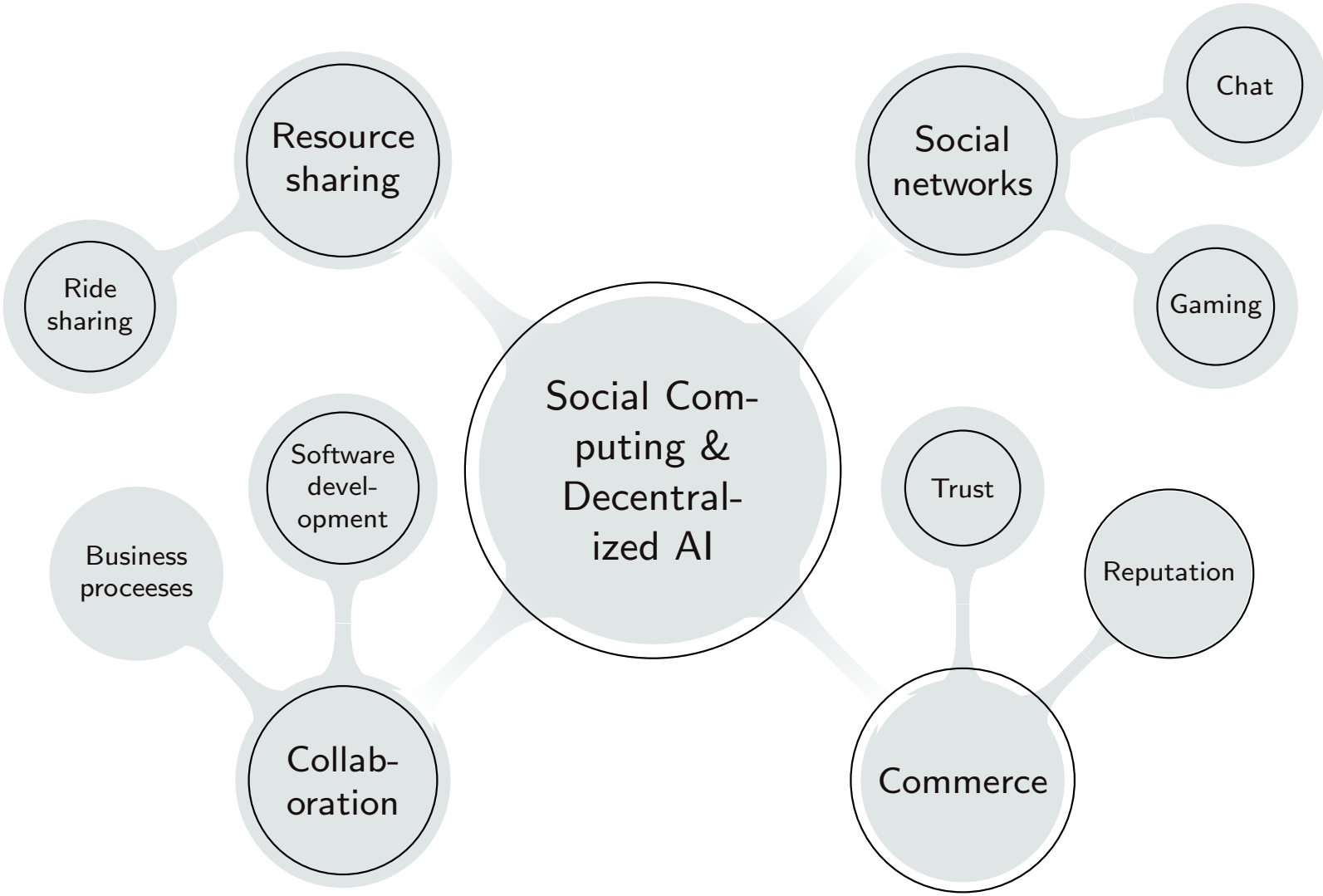
Computing (of or with) Social Relationships

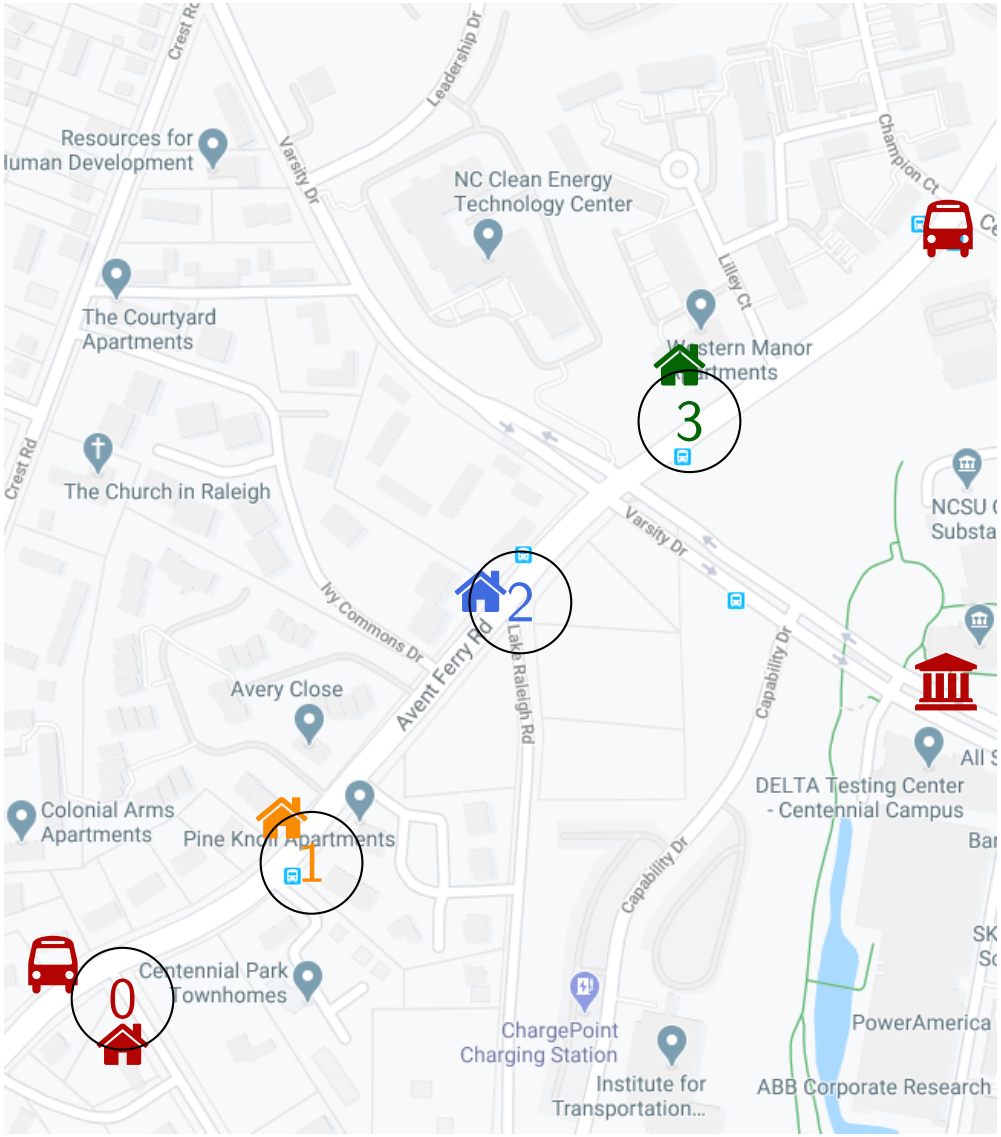
- Exercise: Think of some examples



Social Decisions: Coordinating Despite Decentralization

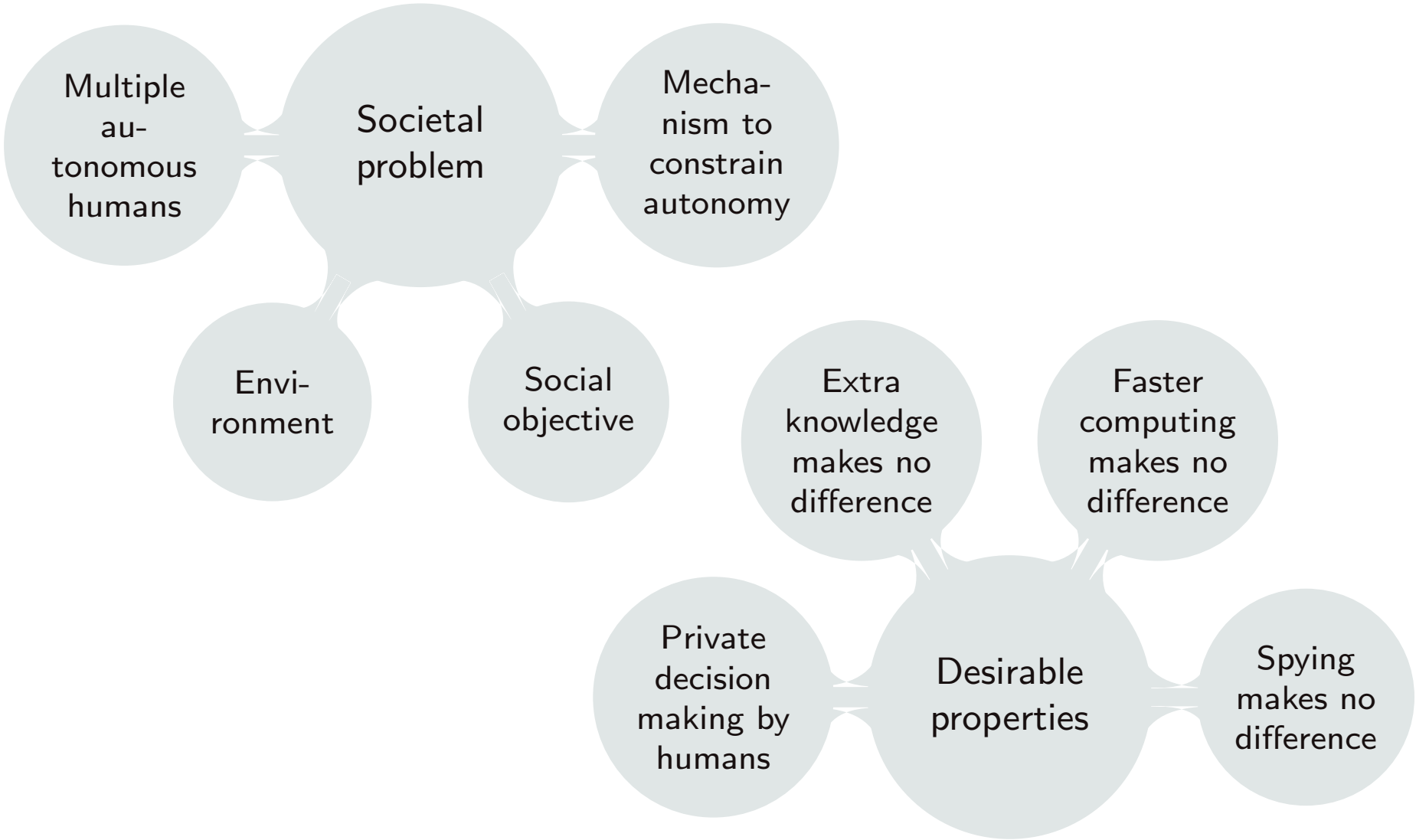
Locating a bus stop

- Bus runs up and down Avent Ferry Rd
- Student houses are highlighted
- Each student wants to minimize distance to bus stop
- Students come to the red building in the middle right
- Suppose there will be exactly one stop on Avent Ferry
- Where should the bus stop be?



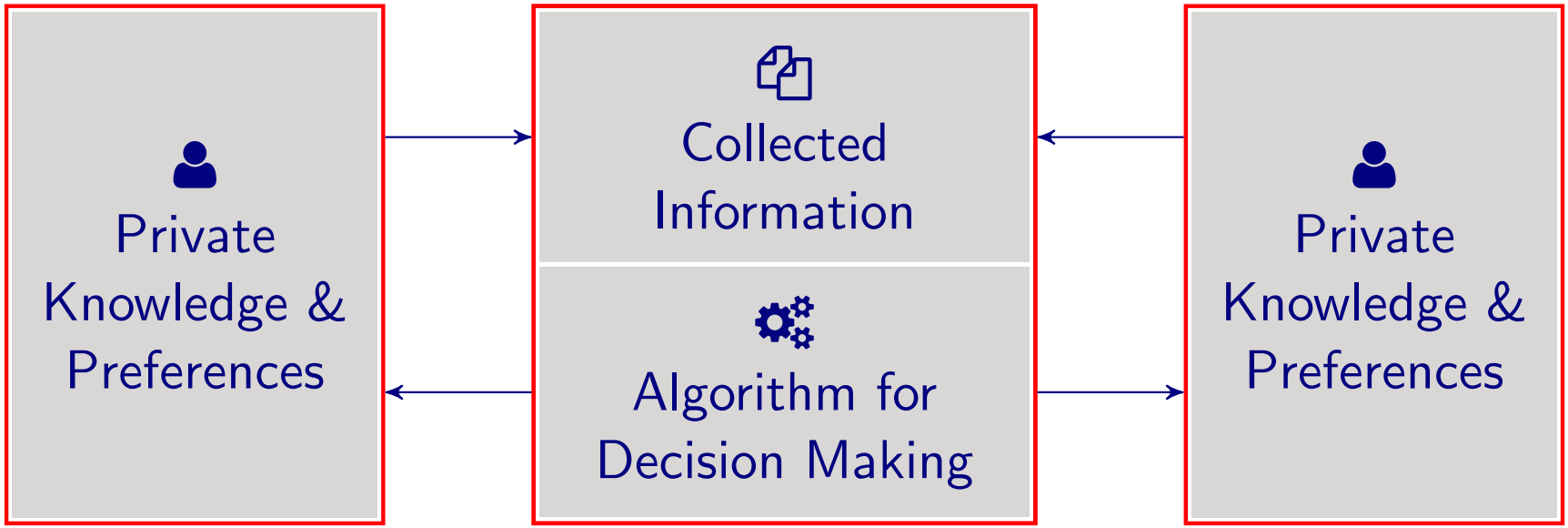
Ingredients of Social Decision Making

A robust *mechanism* is key



The Societal Algorithm is an Incentive Mechanism

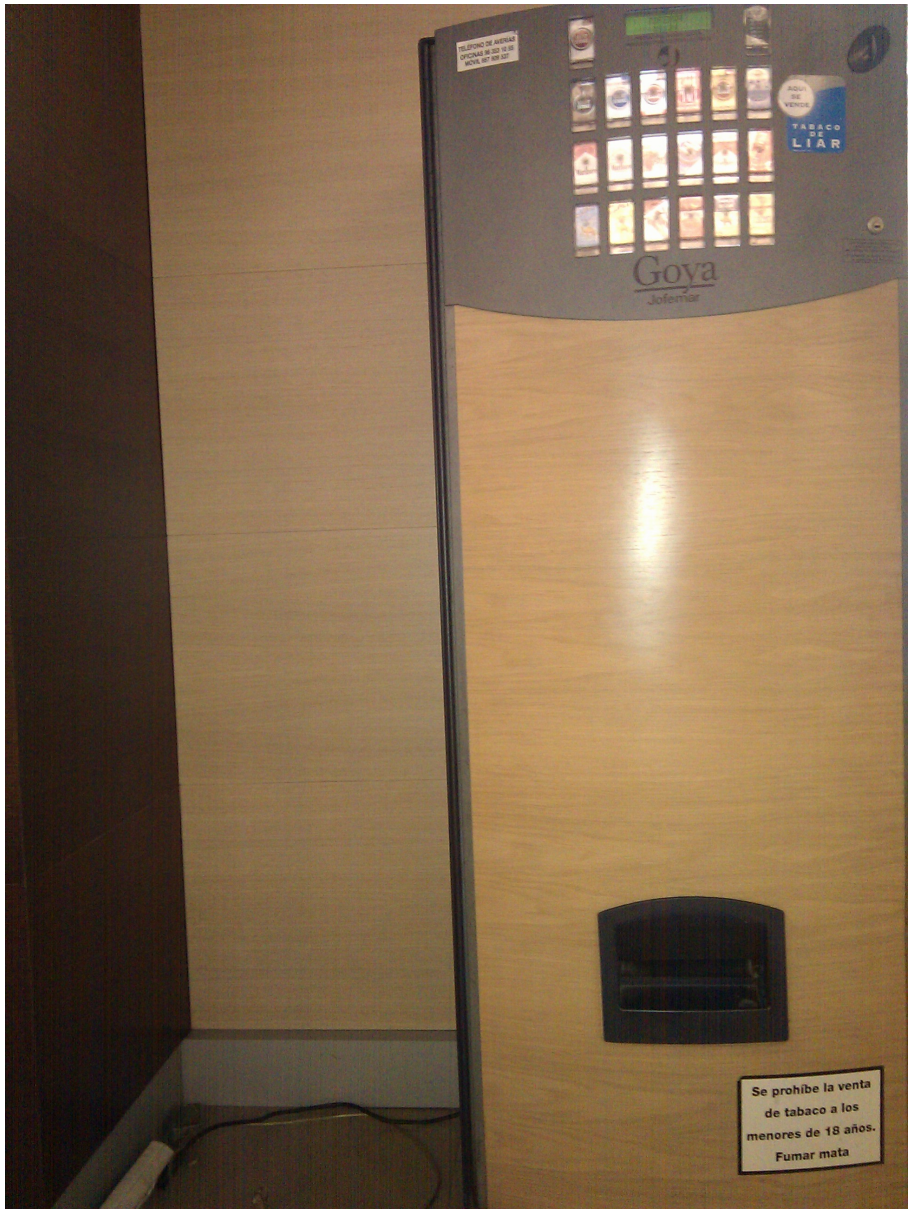
Members reveal some information; the algorithm allocates resources; the members enjoy or suffer the consequences



- How do we get people to participate?
- How do we ensure their incentives are aligned with societal objectives?
  - How do we get people to tell the truth?
  - How do we get people to behave *prosocially*?

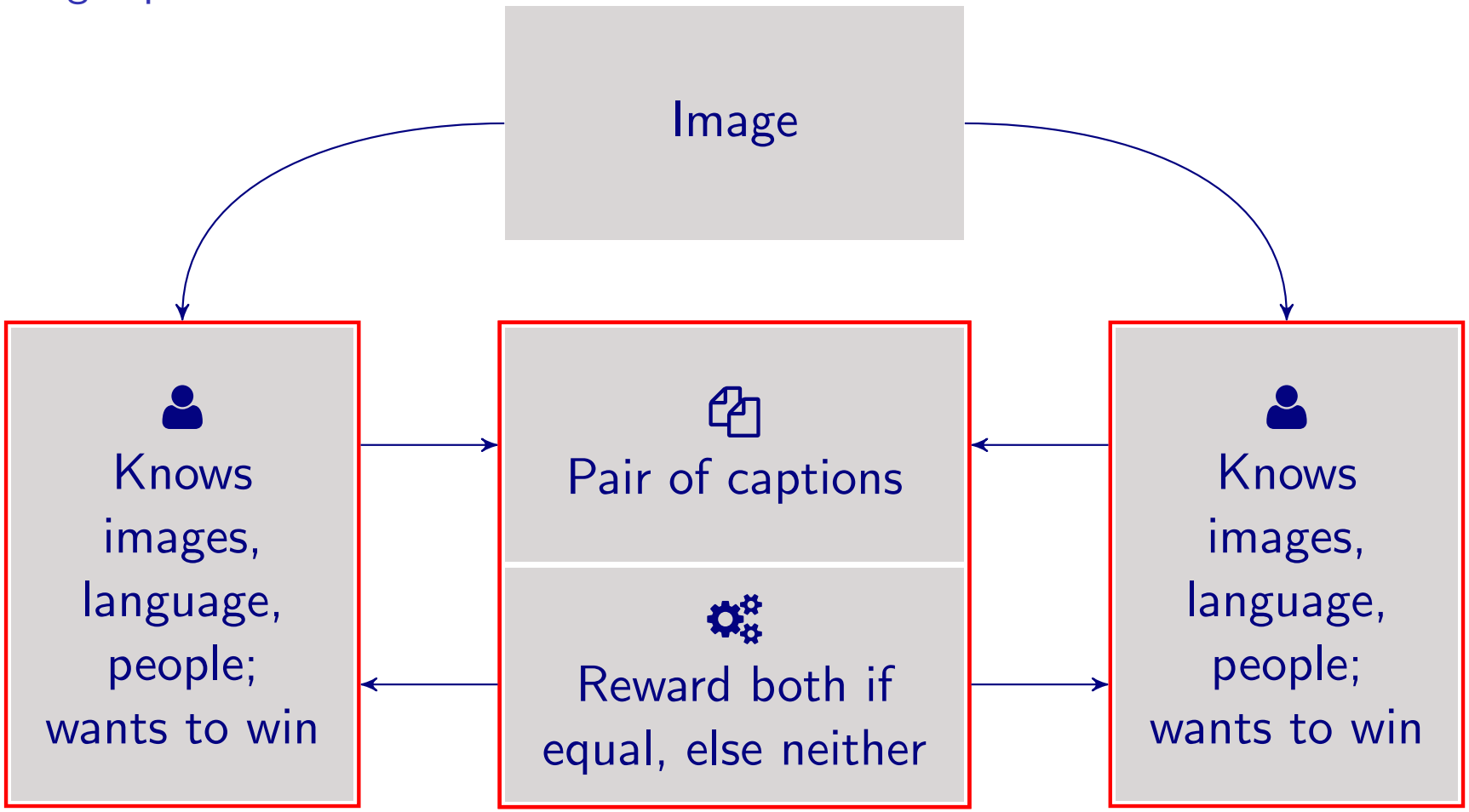
Captioning an Image

- What caption would your give this image?
- Give three captions sorted best to worst



Producing Captions as in the ESP Game

Producing captions



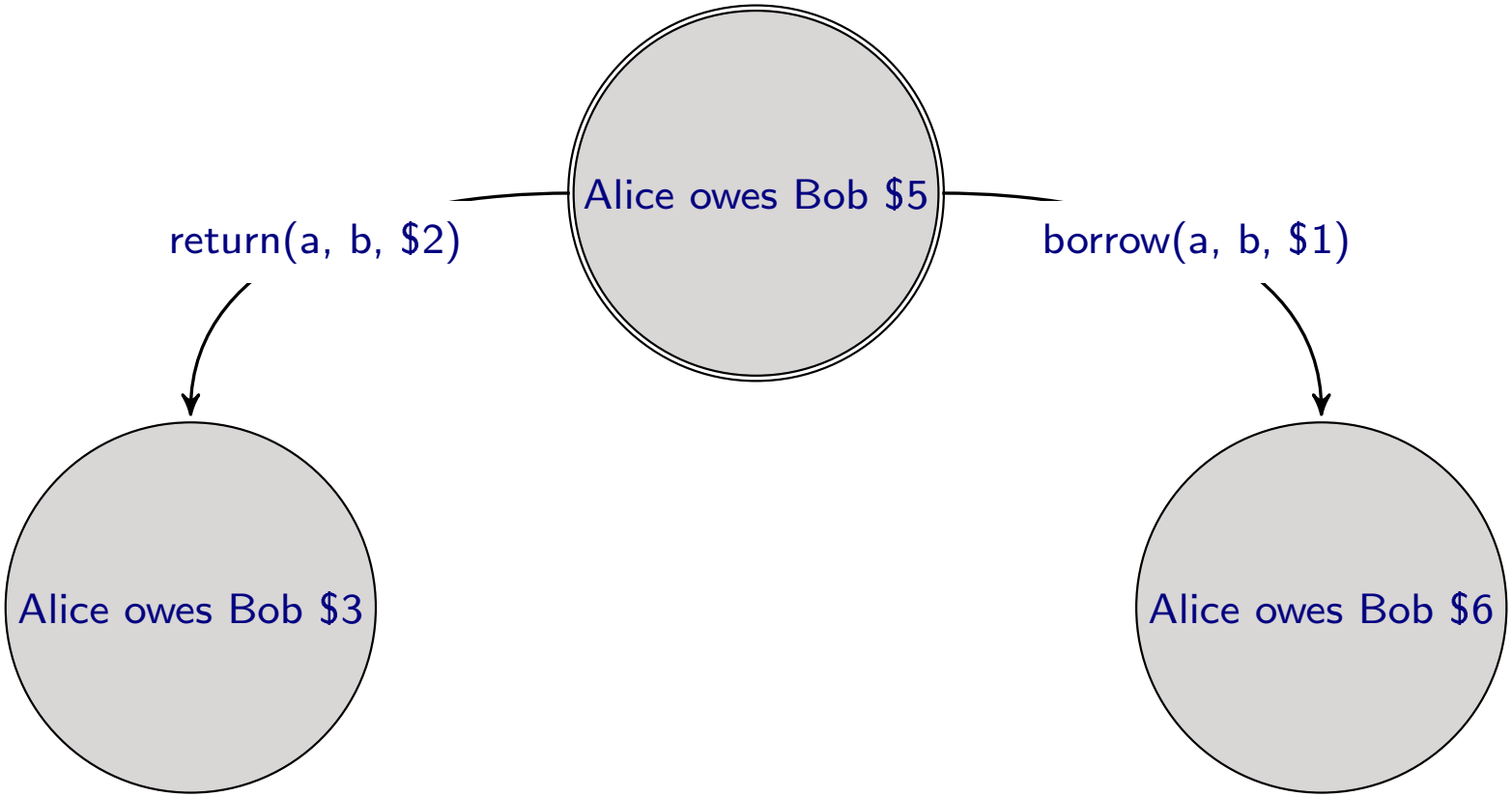
- Induces convergence
- How can we encourage creativity?

Social Computing as a Basis for Decentralized AI

- Principals
  - Autonomous parties (people, organizations)
  - Accountable to one another, in specified ways
- Social relationships
- Social state: snapshot of set of social relationships
- Social computing: computing the social state
  - Operating a social machine
  - Specifying a social machine
  - Conceptual modeling of the specification

Example of a Social Machine

Literally a computational system but the states and transitions are social



- Define such a machine for Linked In

A Sampling of Social Computing Approaches

Platform	Problem	Key Feature
Google	Ranking search results	Hyperlinking and PageRank
Amazon	Help users in product selection	Reviews, comments, ratings
Netflix	Recommend movies to users	User profiles, ratings
KickStarter	Select fundable projects	Projects, rewards, backing
Wikipedia	Create a free encyclopedia	Revision history, talk
Twitter	Find tweets on a topic	Common hash tags
Facebook	Services for apps	Social network
Quora	Find information on something	Questions and answers
Reddit	Select top stories	Feeds, posts, comments
reCAPTCHA	Recognize text in images	User-provided content
ESP game	Determine photo content	User-provided photo captions
Blogger.com	Support conversations	Feeds, posts, comments, tags
LinuxQuestions.org	Forum to resolve issues	Threads
Gmail	Facilitate communication	Conversations, contacts
Mechanical Turk	Perform tasks	Market, HIT
Who . . . Millionaire?	Answering questions	Voting
Iowa Elec. Markets	Predict election outcomes	Market

Dimensions of Variation

Models of problems vis à vis architectures of solutions

- Who may initiate a computation?
- Who selects the participants?
- Are the parties interested in the outcome?
  - Do the parties interact repeatedly?
  - Do the parties learn and might useful outcomes emerge?
  - Is it a majority or a minority game?
- How do participants interact with each other and with requesters?
  - Can a coalition be formed?
  - Is the nature of the work negotiable?
  - How is the service engagement governed?
- Are the results produced continually?

Scoping Social Computing and Decentralized AI

Think of the above-mentioned dimensions and propose additional dimensions

Classify (some of) the samples according to these dimensions

Scoping Social Computing and Decentralized AI

Think of a calendar app being used to schedule a meeting
Potentially, a little more sophisticated than running a Doodle poll

- Think of inputs such as these
  - Topic
  - Time
  - People
  - Location
  - ...
- What are its traditional computational components?
- What are its social components?
- What are important decisions by a user?
- How is the service engagement governed?

Motivation for this Course

Achieving the promise of social computing and decentralized AI

- Computer science is a game of abstractions
  - Need new abstractions for social computing
- Incorporate human-level abstractions
  - Elicit problems more precisely
  - Grant more flexibility to participants
  - Obtain a clearer accountability of actions
  - Hold work to higher standards of norms and ethics

Main technical consequence: how can we accommodate the various forms of social interaction as a basis for computing?