P2P Interaction in Socially Intelligent ICT

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Questions

1. What is ICT-enabled social intelligence?
2. What theories exists on social intelligence?
3. Are there engineering principles for creating social intelligence systems?

1. What is ICT enabled social intelligence?

First let’s ask:

What is Social Intelligence?

What is social intelligence?

Answer

It is the opposite of:

Antisocial stupidity

(hence game theory not much use ;-)

What is social intelligence?

- What is meant by intelligence?
  - doing the right thing to achieve goals given the information at hand (reason)
  - learning from experience in order to improve performance (adaptation / learning)
- What is meant by social?
  - some population of intelligent entities (agents)
  - agents cooperate to achieve their goals
  - goals of agents may or may not conflict
  - interactions restricted by spatial, temporal and informational constraints - may be dynamic

What is social intelligence

- Feedback mechanisms:
  - individual (micro) to collective (macro)
  - collective (macro) to individual (micro)
- Leading to, emergent, "collectively good" outcomes
  - Adam Smith called it the "hidden hand" in the context of markets
  - Many mechanisms other than markets

1. What is *ICT enabled* social intelligence?

- Social intelligence in which:
  - ICT plays a significant role in social mediation
  - The agents are users and possibly computational agents and services
  - enables the emergence of "collectively good" outcomes through e.g.:
    - Fostering cooperation (incentives)
    - Conflict resolution (norms, rules, policing)
    - "Fair" and "productive" allocation of resources
    - Filtering out "bad" adaptations and spreading "good" adaptations

2. What theories exists on social intelligence?

- **Evolutionary theory**: reciprocal altruism, kin, group and cultural group selection
  - How +ve social behaviors / strategies / norms emerge through evolutionary processes
- **Common pool resource theory**: Ostrom's CPRG
  - How people govern common resources collectively and productively
- **Social contract theory**: Rawls' "Theory of Justice"
  - Using reason to derive just social norms / laws that others subscribe to rationally
- **Economics, markets, peer production, symbolic interactionism, enthnomethodology…**

3. Engineering principles for creating social intelligence systems?

- Active research area we focus on in QLectives
- Socially inspired design patterns for P2P:
  - Direct reciprocity (e.g. TFT in BitTorrent)
  - Indirect reciprocity (e.g. credit / points systems)
  - Group selection (e.g. evolving communities)
  - Altruistic punishment (e.g. self-policing)
- See ***QLectives deliverable D2.1.1*** for details on www.qlectives.eu

Questions?

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Elinor Ostrom 1990

Ostrom identifies eight "design principles" of stable local common pool resource management:

1. Clearly defined boundaries (effective exclusion of external unentitled parties);
2. Rules regarding the appropriation and provision of common resources are adapted to local conditions;
3. Collective-choice arrangements allow most resource appropriators to participate in the decision-making process;
4. Effective monitoring by monitors who are part of or accountable to the appropriators;
5. There is a scale of graduated sanctions for resource appropriators who violate community rules;
6. Mechanisms of conflict resolution are cheap and of easy access;
7. The self-determination of the community is recognized by higher-level authorities;
8. In the case of larger common-pool resources: organization in the form of multiple layers of nested enterprises, with small local CPRs at the base level.

User Models

- We need realistic models of how users behave when embedded within given ICT systems
- A priori theoretical models tend not work – users rarely behave “rationally” in the sense of maximising some simple utility
- Empirical measurements suggest its complex – heterogeneous, adaptive, but progress can be made
- Need large-scale deployments / measurements – an empirical / experimental approach

Rawls' "veil of ignorance" approach

- assume we wish to specify the kind of society that is just and good
- but we stand outside the society and don't know what role we ourselves would play
  - we are ignorant of what endowments, knowledge, capacities and position we would hold
- what rules / norms would we accept as just and fair? i.e. what would we accept as "collective good"

Designing a socially int. system

- We wish to specify the requirements of a system that will structure interaction between peers
- the protocol could run on diverse devices with diverse goals, capacities and user behaviour
- but we need 1 billion users of the system to make it a success (and get rich)
- What collective goals will we define such that many different devices and users would accept and run it?
  - “do no evil”? or “make the world a better place”? or “from each according to his abilities to each according to his need”?