Intentions and Systems Intelligence: Prospects for Complexity Research

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Topics

- Humans cope with complexity by forming social cooperative agencies of various sorts
- We propose that bilateral intention signalling and reading capabilities of humans are central to the ability to generate cooperation
- We claim this capability is reflected in *human systems intelligence*
- We suggest that by acknowledging intentions as natural precedents of acts that lead to cooperation, we can find new ways to explain complex social systems and identify intelligent action in them

Systems intelligence: prospects for complexity research

- SI definition: an ability to act intelligently in complex wholes by acknowledging systemicity of the environment and its potential troubles (Hämäläinen and Saarinen 2007)
- Observation: humans are able to make intelligent choices without knowing exactly how decisions will connect to outcomes
- Our hypothesis: **intentionality is in high role in systems intelligence;** more or less explicit expressions of intent play central part in human interaction
- By assuming systems intelligence as a behavioral skill, we can find novel insights in how to cope with complex social systems

Why are intentions important?

- Expressing intentions is a deeply human characteristic that reveals one's will or desire towards some goals
- Intentionality as a purposeful "strategy" extends the human behavioral repertoire
- With intentions, agents are able to avoid myopia that is easily triggered in front of complexity
- Interesting questions about intentions arise:
  - Can humans use intentions to elicit desired responses in other agents?
  - To what extent is intentionality a discretionary vs. autonomous phenomenon?
  - To what extent an agent commits to her intention? ("intention is choice without commitment")

How the mind works?

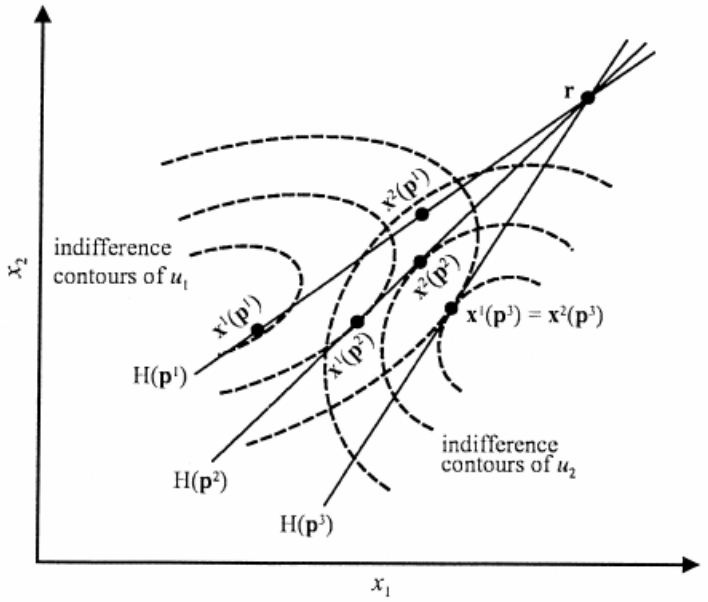
- Intentions exist as states of mind's mirroring systems (Dennett 1987, Blakemore and Decety 2001) – and are central in the theory of mind (Baron-Cohen 1995)
- Using mirroring systems in the brain, humans simulate each others' intentions by taking another's stance
- Goal-directed action (speech, bodily movements) reveals intentions of predators, prey, suitors, or kin
  - We know that a tiger running towards us has the intention to attack, not to hug or play; we just know, there is no need for rational calculation
- Sensitivity to explicate intentions of other agents likely a trait built in evolution

Intentions and cooperation

- Joint gains in cooperation are achieved and maintained by forming legal, moral, or psychological contracts
  - employer ↔ employee; community ↔ member; mother ↔ infant
- The mechanism of forming these contracts thus becomes interesting
- A central tenet: intentions are not binding commitments ... but they do exist in contracting situations anyway – why?
  - Why is there interplay of intentions in human interaction?
- The economic literature studies mathematically the formation of cooperation but lacks considerations of intentionality

Intentions and modeling

- Motivation: computational models of cooperation reveal mechanisms that work, i.e. lead to equilibria
- Computational models of intentions are worth studying to understand and analyze processes of behavior



- Intentions in computational models of cooperation link with considerations of
  - Bounded rationality of decision makers (H. Simon) and psychology of choice (A. Tversky and D. Kahneman)
  - Valuing trust and social preferences in choice
  - Prosociality and reciprocal altruism towards one's communities (H. Gintis, S. Bowles, R. Boyd, E. Fehr)

Conclusions

- Intentions in action naturally reveal wills and desires without full comprehension of the end – a key skill in front of complex environment; they are also abundant in life
  - We express intents to act all the time
  - We read others' intents from their vocal as well as bodily gestures
  - We institutionalize intentions in the forms of marital engagement or letters of intent, and judge breaches of non-binding intentions with norm systems
- Neuroscience has revealed that processes of intention reading occur in the mind and give rise to our ability to understand intersubjectivity
- Intentions are an important part of systems intelligent capabilities of human beings

Selected references

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