



Negotiations & Bargaining (book notes)

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11.3.3.4 Negotiations and Bargaining

1. In a multi-agent system negotiation is form of interaction that occurs among agents with different goals.
2. Major challenge of negotiation is to allocate scarce resources among agents representing self-interested parties. The resources can be badwidth, commodities, money, processing power etc. The resource becomes scarce as competing claims for it can't be simultaneously satisfied.
3. Negotiation is a process by which a joint decision is reached by two or more agents, each trying to reach an individual goal or objective.
4. Initially, the agents first communicate their positions, which might conflict, and then try to move towards agreement by making concessions or searching for alternatives.
5. The major features of negotiation are :
 - (i) The language used by the participating agents,
 - (ii) The protocol followed by the agents as they negotiate, and
 - (iii) The decision process that each agent uses to determine its positions, concessions, and criteria for agreement.

6. Models of negotiatio

- (a) Various models have been proposed for negotiation, based on, heuristic approaches that are domain dependent formalization by experts or based on game theoretic approaches.
 - (b) There is negotiation based on argumentation approaches, in which the agents argue about negotiation-related issues (beliefs, goals, social aspects, ...)
 - (c) There is another model for negotiation that is interest based negotiation in which agent argue about the underlying interests (making underlying goals explicit and discussing them).
- Over the time agent preferences may change and hence the negotiation factors can also keep on changing.
7. Any negotiation mechanism should have the following attributes :

Efficiency - The agents should not waste resources in coming to an agreement.
Stability : no agent should have an incentive to deviate from agreed-upon strategies.

Simplicity - The negotiation mechanism should impose low computational and bandwidth demands on the agents.

Distribution - The mechanism should not require a central decision maker.

Symmetry - The mechanism should not be biased against any agent for arbitrary or inappropriate reasons.

7. Negotiation example,

A Deal after price concession

- Agent1 : I would like to rent a car for 4 days please.
- Agent2 : I offer you one for Rs. 400.
- Agent1 : I reject! How about Rs. 200?
- Agent2 : I reject! How about Rs. 300 then?
- Agent1 : I guess that's the best I can do! I accept!