Homework 2 Report

Distributed Artificial Intelligence and Intelligent Agents , ID2209

Adisu @ Netsanet

November 25, 2017

1 Task 1: Implementing FIPA Dutch Auction

In the first homework we identified the main agents of the smart museum that's built on to of JADE framework and we tried to show how these agents were communicating with each other using different behaviours. In this homework we tried to implement the FIPA Dutch Auction Interaction Protocol. The auctioneer will try to find a good in the market by triggering a bid with a price much higher than the expected market value. We handle this case using two classes. The first is a *CuratorAgent* class which sets up its first bidding price in the setup method. This class also has an inner class to handle the bid operation. In this class the Curator agent will receive the message from the buyers and it can decline the new proposal request if the price of the bidders is below the minimum or if it is higher than the maximum price or can accept the request based on their price.
The other class in this homework is *TalentManagerAgent* which sets the initial Auction Price from 5000000 minimum Auction Price to be 4500000 and auction Reduction Rate 50 on its setup method. This Agent class also has three behaviours which extends from *SimpleBehaviour, OneShotBehaviour and ParallelBehaviour* to identify the bidders, to inform the start of the auction and to handle the process of the auction. So, in this homework we reduced uncessary behaviours.

2 Task 2: Computing Utility/Payoff and Establishing Nash Equilibrium

In this task 2, we were expected to compute the utility or payoff of the different strategies of the agents and determine a nash equilibrium based on the computed payoffs.

Strategies of Profiler Agents:

- view Auction Item
- Not View Auction Item

Strategies of Talent Manager Agents:

- Sell Low Quality
- Sell High Quality

Strategies of Curator Agents:

- Quote Price on Demand
- Quote Price on Profiled Interests

In the given scenario, the curator agents receives the same price specification for a certain auction item from the talent tanager agent and they quote the price based on the quote price on demand or quote price on Profiled interests strategy before selling it to Profiler Agent. This implies that the strategy of curator agents has no any relation to the quality of the product. Hence , we did not include the strategies of curator in computing utility/payoff analysis.
Given Scenario:

- When talent manager sells low quality and and profiler agent views it will be high payoff for talent manager and negative pay off for profiler.
- When talent manager sells high quality and and profiler agent views it will be higher payoff for profiler and still there is a payoff to talent manager.
- When profiler agent doesn't view a high quality product, there is a high negative payoff for talent manager and if the item was a low quality product a little less negative payoff to the artist manager.

Talent Manager / Profiler	Sell Low Quality	Sell High Quality
View	-2, 2	2, 1
Not View	0, -1	0, -2

Figure 1: Pay Off matrix of Profiler and Talent Manager Agents

Based on the utility/ payoff analysis, the nash equlibrium is achieved when the profiler agent follows the strategy of Not viewing auction items and when the talent manager follows the Sell Low Quality strategy

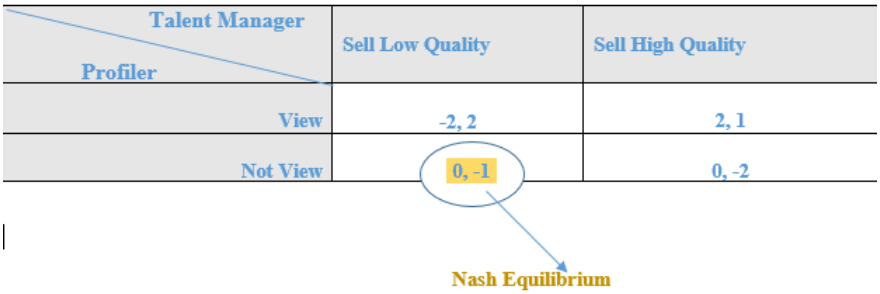

Figure 2: Nash Equilibrium