

Building Game Theoretical Software in a Research Environment

More info here

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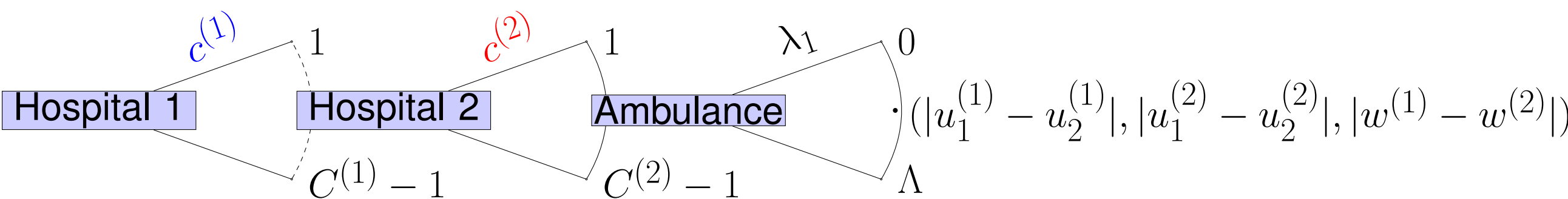


Figure 1: Underlying Stackelberg Game

Stackelberg game, MC, NFG

The issue of waiting times for ambulances at two hospitals can be modelled as a simple Stackelberg game where each hospital has its own AE and Ward. Patients arrive at the AE at rate λ and if there is space in the queue they join it. If there is no space in the queue that patient is lost. Each patient has an AE service time, μ , which represents how long their treatment in AE will last. A proportion, p , of patients are then dismissed immediately. Those who are not dismissed are admitted to the ward if there is space, otherwise they will wait in AE, continuing to occupy a bed. Once admitted, they are treated in the ward with a service time $\hat{\mu}$ and then dismissed without delay.

Sage, Open Source Software

Sage: "Creating a viable free open source alternative to Magma, Maple, Mathematica and Matlab". Ref? The areas of Game Theory that we decided to implement in Sage were Matching Games, Co-operative Games and Normal Form Games. Matching Games allow us to solve problems where players need to be paired with each other, but they have their own preferences. We normally look for stable matching where no

player has any incentive to change their pairing. Co-operative Games are used in situations where players each contribute to a system and those separate contributions require their own payoff. Normal Form Games involve players choosing different strategies against each other and obtaining a payoff. Nash equilibria occur when no player has any incentive to change which strategy they play.

Limitations of MC

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Q-Learning

Q-learning is the process of assigning a state-action value or Q-value to the combination of being in a state, taking an action and observing a reward. The Q-value is then updated by assessing the maximum value of being in the new state. The higher the Q-value the more likely a player is to choose action a when in state s .