Coordinated Sequential Bayesian Persuasion in a Multi-Sender Case

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Abstract

This paper studies an extended Bayesian Persuasion model where there are multiple senders “persuading” one receiver sequentially and the subsequent players can always observe previous signals and messages. Senders have access to a costless signal space as rich as in KG (2011)(2016a) and the information structure corresponds to the coordinated signals defined in Li and Norman (2015). I give the existence proof and the characterization of the Subgame Perfect Equilibrium through a backward recursive method suggested by Harris (1985). SPE summarize the multiplicity of possible strategic interactions among players and identify the range of equilibrium payoffs for senders through persuasion.

Furthermore, I derive an applicable higher-order concavification method in the spirit of Ely (2017) to solve for the Markov Perfect Equilibrium. The existence proof and characterization of MPE are also provided. I find that in zero-sum games, the truth-telling information structure are always supported in equilibrium. However, the general rule that competition improves information revelation (KG(2016a)(2016b)) doesn’t hold in this sequential persuasion model illustrated by a couple of examples. Finally, there generally exists a special type of MPE, called the Silent Equilibrium, where at most one sender designs nontrivial signals. It suggests that this coordinated persuasion model can be highly reduced to a simple Bayesian persuasion model with one representative sender.