

SIU 2021 (29th IEEE Workshop on Applications of Signal Processing and Transmission), June 9-11, 2021, Bahçeşehir University, Istanbul, Turkey (virtual)

Strategic Information Transmission

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Abstract

Strategic information transmission refers to a variation (and a substantial one) of the standard paradigm of information transmission in communication (design of an encoder and a decoder in unison to minimize some distortion measure), where now the encoder and the decoder have (intentionally) misaligned objectives. This leads to a non-cooperative game with a dynamic (non-classical) information structure, where one can adopt as a solution concept either the Nash or the Stackelberg equilibrium. The talk will introduce this class of problems, which has been of interest to multiple communities, including economics, information theory, communication, signal processing, networking, and control, having picked up considerable steam very recently. As an overview of the topic, both old and new results will be presented, with one of the highlights (and perhaps a surprising element) being that there appears to be a major difference between the structures of the solutions under Nash and Stackelberg equilibria, even when the channel is Gaussian and the (misaligned) distortion measures are quadratic. Strategic information transmission is an important underlying feature of *deception games*, which will be highlighted in the talk, along with non-trivial extensions to multi-stage scenarios, covering sensor networks, cyber-physical systems, and multi-agent systems, with adversarial intrusion and elements of deception.