Time-Consistency of Interval Shapley Value in Dynamic Games

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Interval Shapley value (ISV) was initially considered for static one-shot games in [1, 2]. In [3, 4] it was shown that the Shapley value in dynamic games is time-inconsistent. To satisfy time-consistency condition for the Shapley value it is necessary to introduce a new control variable, so-called imputation distribution procedure (IDP). The case with interval Shapley value for dynamic games was not investigated in the game theory literature as well as time-consistency of ISV. It is proved that ISV is time-inconsistent, and the analogue of IDP for constructing time-consistent ISV is proposed.

Keywords: dynamic games, cooperative interval games, interval Shapley value, time-consistency