

A Semantic Framework for Neurosymbolic Computation (Abstract Reprint)

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Abstract

Humans possess innate collaborative capacities. However, effective teamwork often remains challenging. This study delves into the feasibility of collaboration within teams of rational, self-interested agents who engage in teamwork without the obligation to contribute. Drawing from psychological and game theoretical frameworks, we formalise teamwork as a one-shot aggregative game, integrating insights from Steiner's theory of group productivity. We characterise this novel game's Nash equilibria and propose a multiagent multi-armed bandit system that learns to converge to approximations of such equilibria. Our research contributes value to the areas of game theory and multiagent systems, paving the way for a better understanding of voluntary collaborative dynamics. We examine how team heterogeneity, task typology, and assessment difficulty influence agents' strategies and resulting teamwork outcomes. Finally, we empirically study the behaviour of work teams under incentive systems that defy analytical treatment. Our agents demonstrate human-like behaviour patterns, corroborating findings from social psychology research.

References

[López de Aberasturi Gómez *et al.*, 2025] Alejandra López de Aberasturi Gómez, Carles Sierra, and Jordi Sabater-Mir. Grounded predictions of teamwork as a one-shot game: A multiagent multi-armed bandits approach. *Artificial Intelligence*, 341:104307, 2025.