

The R Package CoopGame for cooperative game theory and a uniqueness condition for the Gately point

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The main subject of the talk is the software package CoopGame [1], a comprehensive package for cooperative games with transferable utility written in R.

The package CoopGame [1] currently provides

- 10 different functions for generating TU games with special structures, like e.g. bankruptcy games and weighted voting games
- functions for checking 17 different game properties, like e.g. superadditivity and convexity
- functions for computing 5 different set-valued solution concepts for TU games, including the core
- more than 30 point-valued solution concepts and power indices
- routines for drawing both set- and point-valued solution concepts for the 3- and 4-player cases
- some general functionality useful in the context of TU games, like e.g. computing the unanimity coefficients of a game vector

The talk will give both an overview and a practical introduction to CoopGame, including live demonstrations in R.

Along the way, new theoretical results will be presented, in particular a result on the computation of the Gately point [2] for cooperative games.

References

[1] STAUDACHER, J., AND ANWANDER, J. (2019): *Using the R package CoopGame for the analysis, solution and visualization of cooperative games with transferable utility*. 49 Pages, R Vignette, <https://cran.r-project.org/package=CoopGame>

[2] STAUDACHER, J., AND ANWANDER, J. (2019): *Conditions for the uniqueness of the Gately point for cooperative games*. 10 pages. arXiv preprint, arXiv:1901.01485.