Characterizing the Geometry of Envy Human Behaviour Using Game Theory Model with Two Types of Homogeneous Players

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Abstract : An envy behavioral game theoretical model with two types of homogeneous players is considered in this paper. The strategy space of each type of players is a discrete set with only two alternatives. The preferences of each type of players is given by a discrete utility function. All envy strategies that form Nash equilibria and the corresponding envy Nash domains for each type of players have been characterized. We use geometry to construct two dimensional envy tilings where the horizontal axis reflects the preference for players of type one, while the vertical axis reflects the preference for the players of type two. The influence of the envy behavior parameters on the Cartesian position of the equilibria has been studied, and in each envy tiling we determine the envy Nash equilibria. We observe that there are 1024 combinatorial classes of envy tilings generated from envy chromosomes: 256 of them are being structurally stable while 768 are with bifurcation. Finally, some conditions for the disparate envy Nash equilibria are stated.

Keywords : game theory, Nash equilibrium, envy Nash behavior, geometric tilings, bifurcation thresholds
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