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Approximation of unit-hypercubic infinite two-sided noncooperative game via dimension-dependent irregular samplings and reshaping the multidimensional payoff matrices into flat matrices for solving the corresponding bimatrix game

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The problem of solving unit-hypercubic infinite two-sided noncooperative games is considered. The ultimate goal is to approximate the infinite game with bimatrix game, ranking the approximation accurateness. This is fulfilled in three stages. Primarily the players' payoff functions are sampled under stated conditions of dimension-dependent irregular samplings. Then the sampled payoff functions as multidimensional payoff matrices are mapped into ordinary flat matrices under a reversible matrix map. Finally, after obtaining the solution of the corresponding bimatrix game, equilibrium finite support strategies are checked out for their consistency, being used as the approximation accurateness rank. If consistent, then the bimatrix game can be regarded as the approximation of the initial noncooperative game. For particular cases, conditions of the weakened consistency are stipulated. Different types of consistency ensure the corresponding bimatrix game solution varying reasonably by changing the sampling steps minimally. If the solution is not even weakly consistent by the most primitive consistency in ranking the approximation accurateness, then the sampling intervals should be shortened. If any shortening is impossible then the sampling points must be set otherwise. The suggested approximation tool is fully applicable to games, which are isomorphic to the unit-hypercubic infinite two-sided noncooperative game.

Keywords: two-sided noncooperative games, unit hypercube, approximation, irregular sampling, bimatrix game, multidimensional matrix, equilibrium finite support strategy, approximate solution, equilibrium solution consistency

Data decomposition for formation aggregation values of hypercube in multiprocessor parallel computing systems

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In this paper possibilities of aggregational values calculation is considered. Aggregational values are the main element of multidimensional operative analytical processing. The main reason of using parallel computing systems in data processing is to increase productivity level. Although, parallel computing systems cannot be used in processing all data types. Data processing algorithms and processing data should be gradually adapted to parallel computing systems' usage. In this regard, data decomposition for formation aggregational values in parallel computing systems in data operative analyzing is considered in this paper. In order to identify dependence between data during the process of decomposition Bernstein's conditions are used. At the same time implemented course calculation of from 1-dimension to n-dimension and parallel computation of course interactions will also be considered.

Keywords: OLAP, multidimensional hypercube, aggregational values, parallel computing, decomposition

Models and algorithms of testing software on the basis of the basic specifications

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This article discusses the study of software reliability. Define the concept of software reliability. Examines existing software reliability models and their classification. The main stages of the software life cycle.

Keywords: method of proving the correctness of programs, test method for diagnosis, methods of structured programming, reliability of software, testing, verification, validations