

APPLIED MATHEMATICS

Algorithms in game theory

supervisor: prof. RNDr. Katarína Cechlárová, DrSc.

study form: full time

Annotation: The doctoral student will have an opportunity to get acquainted with the newest trends in the area of Computational Social Choice and solve the newest open problems in voting theory, resource allocation or matching under preferences. We intensively use the language and methods of graph theory; the most relevant areas of theoretical computer science are the design and analysis of exact and approximate algorithms and the analysis of their computational complexity. The topic is suitable also for graduates in Informatics.

Applications of set-theoretical knowledge on ideals in topology

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consultant: RNDr. Jaroslav Šupina, PhD.

study form: full time

Annotation: An ideal on natural numbers is a system of subsets of natural numbers closed under subsets, finite unions, containing finite sets and not containing the whole set of natural numbers. It is a measure of smallness of sets of natural numbers, therefore it has found its traditional place in set theory from the first half of the 20th century. Since the power set of natural numbers with Baire topology is homeomorphic to Cantor set, an ideal is identified with the set of all real numbers. Thus, the set-theoretical research is accompanied by the topological one. A famous survey paper on ideals is [2]. The proposed research of dissertation will deal with a usage of this huge system of intensively developed knowledge in ideal versions of selected traditional notions in topology. We expect a deeper understanding of convergences and selection principles. These notions are recently studied very intensively, see for example [1], [3-7]. A study of relationships between cardinal characteristics of ideals related to these objects introduced in [3-6] seems to be challenging.