

Povzetek

Tema diplomskega dela je teorija iger. Delo se začne z osnovnimi definicijami igre, strategije in dobička. Igre so predstavljene v ekstenzivni in strateški obliki. Kot koncept rešitve je podano Nashevo ravnovesje in obravnavan njegov obstoj. Za preprostejše igre je nakazana metoda za iskanje rešitve. Predstavljeni so pojmi vsesplošnega in vzajemnega znanja. Eno od poglavij je posvečeno ravnovesjem, ki skrbijo množico Nashevih ravnovesij.

Drugi del diplomskega dela se ukvarja z igrami z nepopolno informacijo. Predstavljena je konstrukcija Bayesovo ekvivalentne igre s popolno informacijo, definirano je Bayesovo ravnovesje in pokazana njegova povezava z Nashevimi ravnovesji. Za konec je prikazan še razred iger, za katere obstaja Bayesova igra.

The subject of this thesis is game theory. We begin with the basic definitions of games, strategies and payments. Games are then presented in their extensive and their strategic forms. We treat the problem of defining the concept of a "solution", and introduce the notion of Nash equilibrium as a possible solution. We treat the problem of existence of Nash equilibria and indicate ways to find it in simple situations. We continue with the introduction of common and mutual knowledge, and then treat refinements of the notion of equilibrium.

In the second part we introduce games with incomplete information, which in turn are reduced to equivalent Bayesian games with complete information. We investigate the connection between Nash and Bayesian equilibrium, and in the end identify the class of games for which Bayesian equilibria exist.

Math. Subj. Class. (1995): 90D06, 90D10

Key words: game theory, Nash equilibrium, common knowledge, refinements of Nash equilibrium, games with incomplete information, Bayesian games

Literatura

- [1] R. Aumann, *Agreeing to Disagree*, The Annals of Statistics **4**, 1976, 1236–1239
- [2] A. Brandenburger, *Knowledge and Equilibrium in Games*, Journal of Economic Perspectives **6**, 1992, 83–101
- [3] G. Debreu, *A Social Equilibrium Existence Theorem*, Proceedings of the National Academy of Science **38**, 1952, 886–893
- [4] D. Fudenberg, J. Tirole, *Game Theory*, The MIT Press, Cambridge, Massachusetts 1991
- [5] J. C. Harsanyi, *Games with Incomplete Information Played by "Bayesian" Players*, I - III, Management Science **14**, 1967/1968, 159–182, 320–334, 486–502
- [6] J.C. Harsanyi, *Games with Randomly Disturbed Payoffs: A New Rationale for Mixed Strategy Equilibrium Points*, International Journal of Game Theory, **1**, 1973, 1–23
- [7] R. Jamnik, *Teorija iger*, DZS, Ljubljana 1973
- [8] S. Kakutani, *A Generalization of Brouwer's Fixed Point Theorem*, Duke Mathematical Journal **8**, 1941, 457–459
- [9] P. Milgrom, *An Axiomatic Characterization of Common Knowledge*, Econometrica **49**, 1981, 219–222
- [10] P. Morris, *Introduction to Game Theory*, Springer - Verlag, New York
- [11] R. B. Myerson, *Refinements of the Nash Equilibrium Concept*, International Journal of Game Theory **7**, 1977, 73–80
- [12] J. Nash, *Equilibrium Points in n - Person Games*, Proceedings of the National Academy of Sciences **36**, 1950, 48–49
- [13] R. Selten, *Reexamination of the Perfectness Concept for Equilibrium Points in Extensive Games*, International Journal of Game Theory **4**, 1975, 25–55
- [14] R. Wilson, *Computing Equilibria of n - Person Games*, SIAM Journal of Applied Mathematics **21**, 1971, 80–87