Evolutionary Game Theory for Empirical Evidence

Mitsuru KIKKAWA（吉川 満)[1]

Keywords： Evolutionary Game Theory, Quantal Response Equilibrium, Logit Model, Particle Filter

Abstract

Recent technological advances have enabled substantial amounts of accurate data to be experimentally measured in various complex systems.　Until now we have developed extraction models to elucidate the essence of complex phenomena and have analyzed this model. However, this model is contrary to fact due to several constraints mathematically, numerically. This talk bridges the gap between game theory and empirical evidence involving complex phenomena.

In detail, this research is based on Kikkawa [1] and derives Multi-Level Logit model which is used in Micro-Econometrics, Nash equilibrium. And this research gives examples: this method is used in some game's experimental results and financial market. Furthermore, we treat this game theory as a nonlinear state space model. [2] We analyze this game theory with particle filter.

Up to the present, Mckelvey and Palfrey [3] which is used by Multi-Level Logit model is known to explain the experimental result. But Mckelvey and Palfrey [3] is a theory to explain the data. This talk presents new game theory which is considered from a real data.

REFERENCE

[1] Kikkawa, Mitsuru ： "Statistical Mechanics of Games ： Evolutionary Game Theory," *Progress of Theoretical Physics Supplement*, No.**179** (2009), pp.216-226. [HP]
[2] Kitagawa, Genshiro: "Monte Carlo Filter and Smoother for Non-Gaussian Nonlinear State Space Models," *Journal of Computational and Graphical Statistics*, Vol. **5**(1960), pp. 1-25. [HP]
[3] Mckelvey, Richard D. and Palfrey, Thomas R. ： "A Statistical Theory of Equilibrium in Games," *Japanese Economic Review*, Vol.**47** (1996), No.2, pp.186-209. [HP]

---

[1] mitsurukikkawa@hotmail.co.jp, Department of Science and Technology, Meiji University.
Resume is available at http://kikkawa.cyber-ninja.jp/ .