



Meiji University Global COE Program

12th Mathematical Sciences based on Modeling, Analysis and Simulation seminar



Date : July 22, 2009, 16:30~17:30

Location : Meiji Univ. Ikuta Campus, Build 2 Annex A, Room A205

Shiro Horiuchi (Meiji Univ.)

Title : A hidden edge effect on animal group size
and density: an agent-based model revealed

Abstract : Apart from the foraging conditions and predation pressure, which are often studied concerning the ecological edge effects, we aimed to clarify the boundary nature of edges, from which animals cannot move any farther. By simulating animal groups interacting with one another, we made an agent-based model in a computational space. Assuming no predation pressure, we changed only the resource conditions in contrast between the habitat (comprising 'interiors' and 'edges') and its 'exteriors'. The obtained results were robust---only when the resources are sufficiently richer in the habitat than in the exteriors, the group density and size tend to be greater in the interiors than in the edges (i.e. boundaries between the interiors and exteriors); otherwise and more often the group density and size tend to be greater in the edges, or differ little. These were discussed with reference to relevant studies of primates in particular as exemplary group-living animals. We also show that expelling monkeys from edges to interiors---or from farmlands to mountains---work effectively only where the density of monkeys is low, such as Tohoku or Hokuriku areas in Japan Island.

Everyone is welcome to attend the MAS seminar.

Meiji institute for Advanced Study of Mathematical Science (<http://www.mims.meiji.ac.jp>)

(Organizers: M. Mimura, D. Ueyama, Y. Wakano and K. Ikeda)

MAS seminar is partly supported by Meiji University Global COE program "Formation and Development of Mathematical Sciences Based on Modeling and Analysis" (<http://gcoe.mims.meiji.ac.jp/>), the Grant-in-Aid for Scientific Research (S), "Mathematical Theory of Nonlinear-Non-equilibrium Reaction-Diffusion Systems" by M. Mimura (<http://nnrds.math.meiji.ac.jp/>).

Access: 10 minutes on foot from Ikuta St. Odakyu line,
Or 10 minutes by bus No. 13「明治大学正門前」, get off at the last stop.
See http://www.meiji.ac.jp/koho/campus_guide/ for details.