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ワークショップ参加レポート
Report: International Workshop on Bioinformatics and Systems Biology (IBSB) 2012

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1 Overview

International Workshop on Bioinformatics and Systems Biology (IBSB) 2012 was held at Boston University, the United States. Boston city was very beautiful with old the European style architecture and traditional old buildings. People there looked enjoying the landscape of the city. Boston University had also beautiful and large campus and I had an opportunity to give a talk on my research at the meeting. At IBSB meeting, many researchers from Boston University and Humboldt University attended to discuss topics in the fields of Bioinformatics and System Biology. We had fruitful time to share our ideas and views.

2 IBSB meeting

At IBSB meeting, I had a chance to introduce and talk my research, whose title is 'Stability and restoration in Canadian lynx and snowshoe hare population cycle '. I talked about the concept of the stability which is important to understand natural phenomena in biological and engineering systems.

We studied the relation between the conservation law and the stability of a 2n-dimensional competitive system that contains competitive interactions, self-interactions and mixing interactions as previous work. The system consists of 2n-dimensional nonlinear differential equations required from Noether's theorem. The 2n-dimensional nonlinear ordinary differential equations for the competitive system constructed to satisfy the conservation law have properties such as the addition law, which is empirically interpreted as recovery from injuries of skin and tissues in biological bodies.

The interaction between Canadian lynx and snowshoe hare has a well-known characteristic property as a prey-predator system. The Canadian lynx and snowshoe hare have a synchronous ten-year cycle in population numbers. The structure of this cycles is related to the several factors such as nutrient, predation and social interactions, but the fundamental mechanisms have not been clarified. We emphasized that the properties of the system which has the conserved quantity are a key to understand the unanswered question for the existence of this cycle.

At this meeting, we explicitly and numerically discussed the properties of the conserved stable 2-variable nonlinear interacting system, its indications and possible applications to nonlinear interacting systems by simulating external perturbations.

After the talk, I received interesting comments and useful ideas for application such as cancer cell and anticancer drug competitive system which I would like to research in the future. It was the very grate experience for me and I enjoyed discussing with other researchers.

3 Recreational Activities

There were many activities besides the meeting such as cursing, barbecue and sight seeing. I attended them all and we had a nice cultural exchange. Through those meetings, we could socialized with other researchers from different countries. I am very grateful the opportunity offered by Bioinformatics Center at Institute for Chemical Research of Kyoto University.