

# APCTP SEMINAR

## Lecture 1.

### 게임이론에서 전략들의 네트워크 구조

**Prof. Seung-Woo Son**

*Hanyang University*

**Jul. 6 (Mon) 15:00**

**#512, Hogil Kim Memorial Bldg.**

**& ZOOM Webinar**

#### **Abstract**

We considered the replicator dynamics to study an iterated prisoners' dilemma game with memory. In this study, we investigate the characteristics of all 32 possible strategies with a single-step memory by observing the results when each strategy encounters another one. Based on these results, we define similarity measures between the 32 strategies and perform a network analysis of the relationship between the strategies by constructing a strategies network.

\* This seminar will be given in Korean.

#### ■ **On-site**

You can participate in the seminar directly on-site at seminar room #512 of the Center.

#### ■ **ZOOM Webinar**

1) Click the following link

<https://zoom.us/j/94146976977?pwd=aVdTZ2dQbkZGNnZkSVFFaHdndFFrZz09>

2) Join the webinar with your email account and name

#### ■ **Contact information**

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# APCTP SEMINAR

## Lecture 2.

### Ecological networks: Nested or not, or does it really matter?

**Prof. Sang Hoon Lee**

*GNTECH*

**Jul. 6 (Mon) 15:50**

**#512, Hogil Kim Memorial Bldg.**

**& ZOOM Webinar**

#### **Abstract**

The concept of nestedness, in particular for ecological and economical networks, has been introduced as a structural characteristic of real interacting systems. In this talk, starting from basic concepts of network science, I will present a few selective examples of measures and techniques developed in network science, which can be useful to analyze structural properties of ecological systems, in particular, mutualistic interactions between plants and animals. Based on them, I have discovered that the "traditional" notion of nestedness is in fact related to other mesoscale network properties such as the so-called core-periphery structure. With real ecological mutualistic networks and synthetic model networks, I have reported the strong correlation between the nestedness and core-periphery-ness (likeness to the core-periphery structure), by defining the network-level measures for nestedness and core-periphery-ness in the case of weighted and bipartite networks. However, at the same time, via more sophisticated null-model analysis, I have also discovered that the degree (the number of connected neighbors of a node) distribution poses quite severe restrictions on the possible nestedness and core-periphery parameter space. Therefore, there must exist structurally interwoven properties in more fundamental levels of network formation, behind this seemingly obvious relation between nestedness and core-periphery structures. More recently, in collaboration with ecologists, we have (boldly) suggested that the core-periphery structure could be even more relevant to describe the mutualistic interactions than nestedness, from literature survey along with our own analysis. As a final remark, I would like to emphasize the necessity for further studies on the relationship between network structures and the ecological stability, which might be one of the least studied topics in network science, I dare to add.

*\* This seminar will be given in Korean.*