

Introduction and Applications System Biology

Time 2024.4. 27-28 10:00-16:30

Venue

Room 515, Cosmology Building, NTU



Lani Fang Wu University of California, San Francisco

Steven Jeffrey Altschuler

Organizers

Tai-Chia Lin National Taiwan University

Feng-Bin Wang Chang Gung University **Outline & Descriptions**

Biological systems have the ability to form spatial patterns, respond to stimuli, and adapt to new environments. Systems biologists seek to understand how molecular networks give rise to these behaviors. Simple mathematical models can be useful in hypothesizing fundamental principles and making predictions that can be experimentally tested.

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Te-Sheng Lin

National Yang Ming Chiao Tung University

Introduction & Purposes

This course intends to introduce system biology to mathematicians. Some applications will also be mentioned.

Schedule

April 27, 2024

10:00 -10:50	Lecture 1 : Adaptation to changing environments
11:00 -11:40 11:45 -12:00 13:30 -16:00 16:00 -16:30	Lecture 2 : Stochastic pattern formation Project 1 : Introduction Hands-on implementation and exploration Discussion

April 28, 2024

- 10:00-10:50 Lecture 3 : input-coupled positive feedback
- 11:00-11:40 Lecture 4: swarming behaviors
- 11:45-12:00 Project 2: Introduction
- 13:30-16:00 Hands-on implementation and exploration
- 16:00-16:30 Discussion

We will go through several case studies that show how mathematical modeling was applied successfully to understand complex biological systems. In the mornings we will lecture and have discussions. In the afternoon, students will have hands-on opportunities to develop and play with these models



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