سمینار هفتگی ماده چگال نرم

Effect of environmental interactions on evolutionary dynamics in graph structures

Abstract

Environmental heterogeneity, or environmental interactions in evolutionary graphs can drastically change the population dynamics compared to the uniform environment. Such heterogeneity can be imposed in different ways. In this study we choose periodic pattern for the environmental heterogeneity with different values for amplitude and period. Imposing periodic heterogeneity on cyclic graphs, we studied the fixation probability and time. We use birth-death Moran model as the update rule. We observe that with such heterogeneity, an advantageous type in the uniform environment can turn into deleterious in the presence of heterogeneity. Also, the opposite way can happen. The results show that changing the period can have significant effect on the fixation probability, time and condition for selection. With the largest period, the studied parameters behave differently compared to the other periods. These behaviors can be counter-intuitive in some cases. The fixation probability of an inherently neutral mutant in MFH and RFH scenarios is qualitatively similar to the deleterious and advantageous mutants in BFH scenario, respectively. Eventually, we study the effect of phase shift of the fitness distributions of the two types and observe that such phase shift can have significant effects on the fixation probability and time.

Hossein Nemati

Sharif University of Technology

زمان: شنبه ۱۴۰۰/۱۲/۱۴ ساعت ۱۵:۳۰

مکان: کلاس مجازی دکتر اجتهادی

https://vc.sharif.edu/ch/ejtehadi