YCCSA Seminar Series
Spring 2020

An interdisciplinary seminar series hosted by the York Cross-disciplinary Centre for Systems Analysis aimed at researchers from all disciplines

Cluster partitions and fitness landscapes of the Drosophalia fly microbiome

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RCH/017, Ron Cooke Hub, 13:30

Abstract:
The concept of genetic epistasis defines an interaction between two genetic loci as the degree of non-additivity in their phenotypes. A fitness landscape describes the phenotypes over many genetic loci, and the shape of this landscape can be used to predict evolutionary trajectories. Epistasis in a fitness landscape makes prediction of evolutionary trajectories more complex because the interactions between loci can change the likelihood of different trajectories.

While various mathematical frameworks have been proposed to calculate epistasis in fitness landscapes, Beerenwinkel et al. [1, 2] suggested studying regular subdivisions of convex polytopes.

In this talk, I report on joint work with Eble, Joswig and Ludington [3] and describe how cluster partitions and cluster filtrations for regular subdivisions provide a new and concise combinatorial way of processing epistatic information in fitness landscapes. New findings for the case of microbial taxa in the gut microbiome of Drosophila fruit flies are also presented.

The seminar includes a refreshment break to fuel interdisciplinary discussion

Ron Cooke Hub is on Heslington East Campus – accessible by free bus services Nos. 66 and UB1 running at frequent intervals from Heslington West.