

Explanation of the graphical output

Each graphical output file has 4 windows.

The first window represents each patch as a square in a two-dimensional array. The color of the square defines the niche. Each local population is represented by a circle within the square. The color of the circle defines the niche preferred by the majority of individuals. Shown is the final state of the system.

The window below shows the dynamics of some statistics over the course of simulations (100,000 generations). The statistics are evaluated every 500th generation. The two red lines show the average fitness in the optimum niche (higher line) and the average preference for the most preferred niche (lower line). The two blue lines show the average fitness in the current niche (higher line) and the average preference for the current niche (lower line). The green and white lines shows the percentage of purebred and Cramer's V, respectively. The pink line shows the overall number of individuals in the system relative to the maximum carrying capacity.

The histogram shows the relative numbers of individuals in 8 niches. The brighter dash on (or sometimes above) each bar shows the relative number of purebred individuals of this type. Note that the number of individuals per niche and the number of purebred individuals of a species corresponding to the niche are given on different scales. Letters "f" and "m" mark the niches which are preferred by the majority of individuals with regard to fitness and migration, respectively. Shown is the final state of the system.

The fourth window represents a $2^k \times 2^k$ array of squares colored using gray color scheme. The intensity of color of the (i, j) square is proportional to the number S_{ij} of individuals who most prefer niche i but are most fit in niche j . This is the niche matrix used to compute Cramer's V. The diagonal elements of the matrix correspond to purebred individuals. Shown is the final state of the system.

Also shown are some numerical statistics in the last generation: Speed (not relevant here), Generation (generation number), MaxPopSize (maximum local population size relative to the carrying capacity), AvCarCap (average carrying capacity), Cramer's V, and Purebred (proportion of purebred individuals),

AvMatch (fitness) and AvMatch (pref) are the averages of the measures $Q_f(I, J)$ and $Q_m(I, J)$ defined in the following way:

$$Q_f(I, J) = 1 - \frac{1}{k} \sum_{i=0}^{k-1} |x_i(I) - \theta_i(J)|, \quad (4)$$

$$Q_m(I, J) = 1 - \frac{1}{k} \sum_{i=0}^{k-1} |y_i(I) - \theta_i(J)|, \quad (5)$$

These characterize the degree of “matching” of organism I and niche J with regard to fitness and migration, respectively ($0 \leq Q_f(I, J), Q_m(I, J) \leq 1$).