2.1. Initialization

The initialization of this model is by choosing a length L so that the grid is of size LxL. The initial cultural vectors a chosen randomly for each agent, where each of the N traits a feature can be is represented by a number from $[1, N]$. So for the example of an agent with a cultural vector of 4 features with 3 possible traits could then be $(1, 3, 2, 2)^T$. An example how an initial grid could look lke is illustrated in Fig. 1.

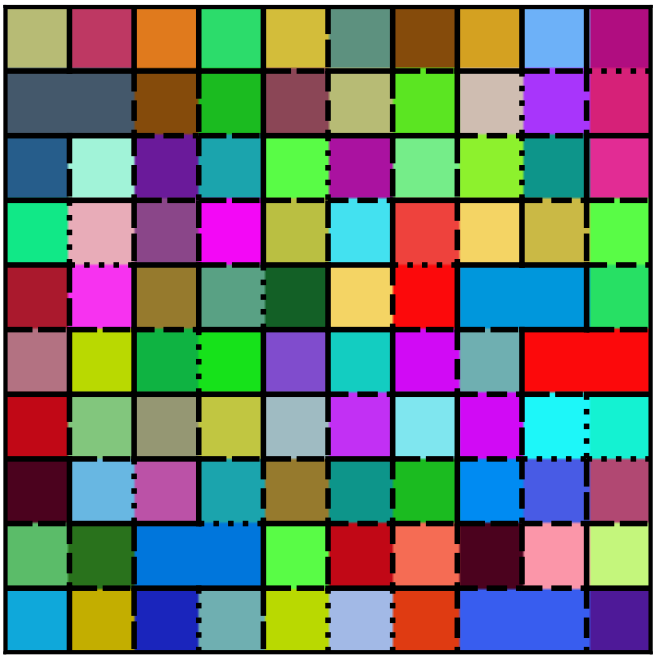

Figure 1. Example of an initial grid of size 10x10 with cultural vectors of 5 features with 3 possible traits. Every color denotes a different vector, the lines between the agents denote the similarity depicted by the dot density.

As can be seen, in the initial configuration there is a lot of fragmentation. In the following time steps this fragments will perish due to the pairwise interaction of the local agents reaching a globally more similar culture.

2.2. Interaction

This is an iterative process where every iteration step looks like the following. One random agent across the grid is chosen. Then a random neighbor of this agent (the definition of neighbors is variable and leads to different results as discussed later) is chosen and their cultural vectors are compared element wise. Their interaction probability p is given by the amount of features they share divided by the total amount of features, therefore giving a value between 0 - for completely different vectors - to 1 - for identical vectors. If the interaction takes place the chosen agent adopts a trait of a feature from its neighbor which they do not share. Then the iteration is repeated. Again for the example of 4 features with 3 possible trais the interaction probability p of one iteration between the agent a at position 2x3 and its neighbor at 2x4 could look like this:

$$\vec{a}_{23} = \begin{pmatrix} 1 \\ 3 \\ 2 \\ 2 \end{pmatrix} \text{ and } \vec{a}_{24} = \begin{pmatrix} 2 \\ 3 \\ 2 \\ 1 \end{pmatrix} \rightarrow p = 50\%.$$

When p is equal to 1 the interaction between the two agents is guaranteed but redundant since for $p = 1$ they must already share all the same features. When $p = 0$ none of the features of the two agents is alike and no interaction takes place. For both of these cases nothing happens and the algorithm proceeds with the next iteration. So the stepwise procedure goes: