

# Machine Intelligence 2 - Exercise 11

## Stochastic Optimization

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### 11.2 Self-Organizing Maps

Initial learning rate  $\eta = 1$ , reduction factor  $\eta_{red} = 0.99$ . Initial sigma  $\sigma = \log_2(K)$ , reduction factor  $\sigma_{red} = 0.99$ .

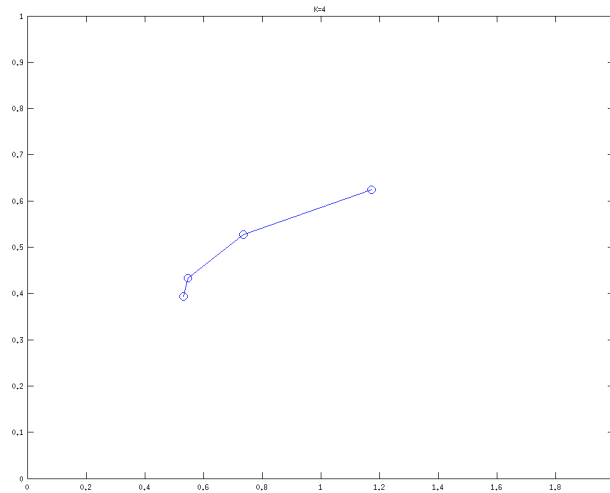


Figure 1: K=4

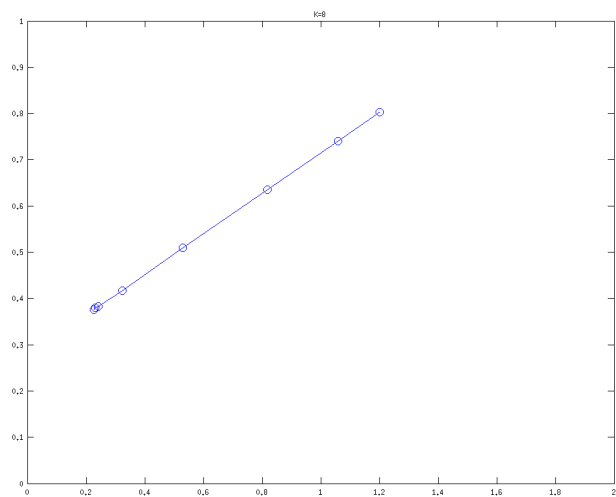


Figure 2:  $K=8$

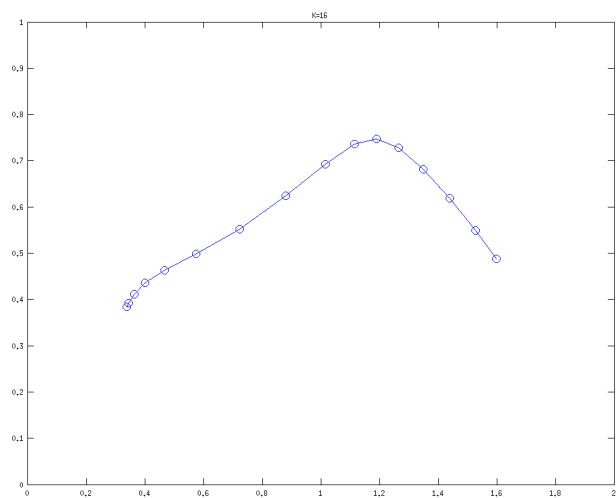


Figure 3:  $K=16$

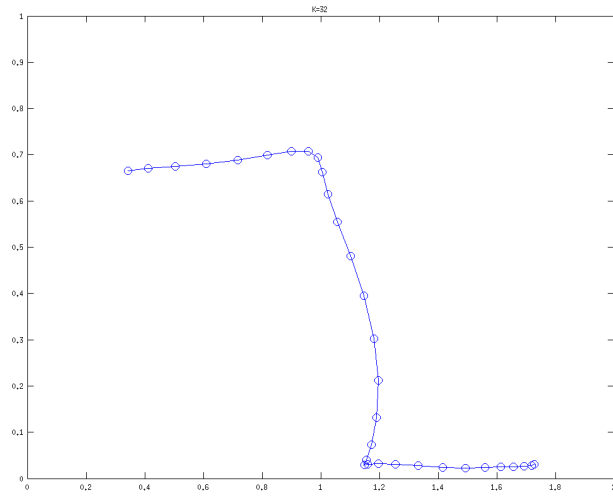


Figure 4: K=32

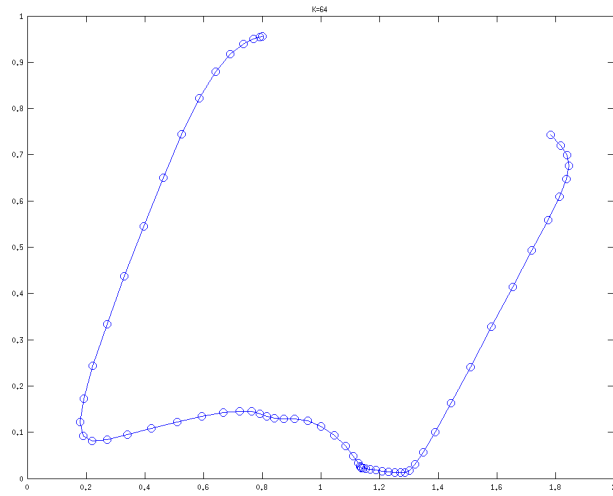


Figure 5: K=64

### 11.3 Mean-Field Annealing

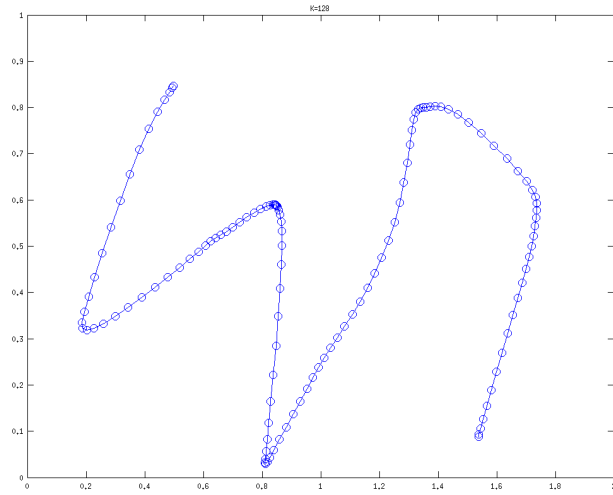


Figure 6:  $K=128$

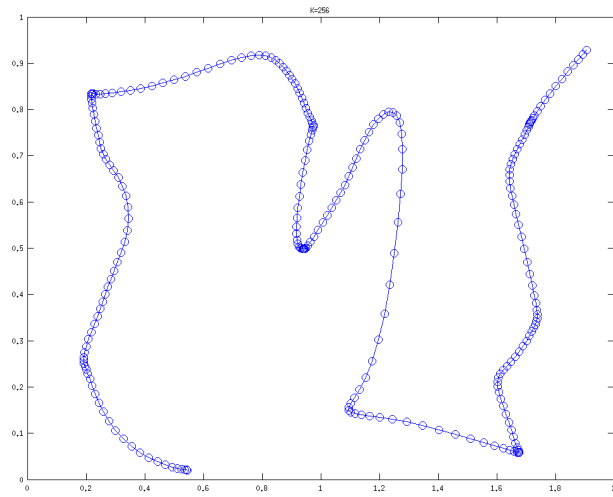


Figure 7:  $K=256$

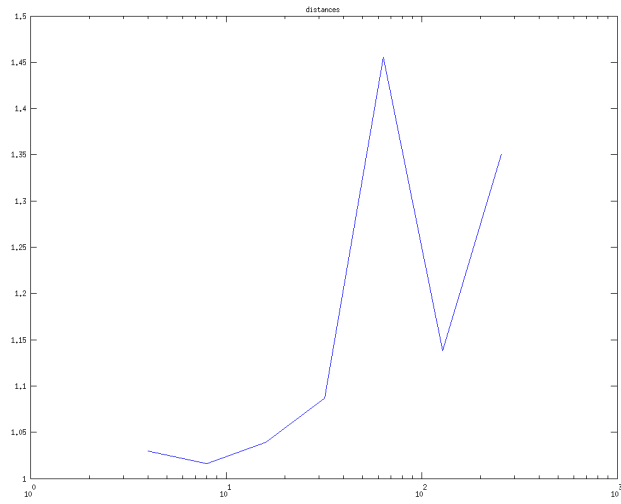


Figure 8: Average distances between the best and the second best fit measured in map space distance.